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The Afrotropical dacetine ants
(Formicidae)

Barry Bolton

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Synopsis

The nine genera (107 species) of Afrotropical dacetine ants are revised; keys to the genera and to the species of each genus are presented. The genus-level name *Miccostruma* Brown is newly synonymized with *Smithistruma* Brown, of which 35 species are recognized and 27 are described as new. Two species formerly placed in *Codionymyrmex* Wheeler are transferred to *Glamyromyrmex* Wheeler, of which a total of 11 Afrotropical species are described. Eleven species of *Serrastruma* are recognised of which five are new (one is an inquiline form). Six new synonyms are proposed in this genus and one previously synonymized name is returned to specific status. Four species of *Epitritus* Emery and two of *Microdaceton* Santschi are known, and one species each of *Quadristuma* Brown, *Cladarogenys* Brown and *Trichoscapa* Emery, the last recorded for the first time from sub-Saharan Africa. Of the 41 recognized Afrotropical *Strumigenys* Smith 23 are described as new in this paper and two previously synonymized names are returned to specific status.

Introduction

Modern taxonomic work on the dacetine ants dates back only to Brown (1948) who published a revisionary survey of the tribe as it was then understood. This was followed by a series of papers refining the ideas of the original study by defining some of the genera more accurately and delimiting other new genera (Brown, 1949a; 1949b; 1950a). During the course of these studies it was recognized that a number of genera originally placed with the dacetines did in fact constitute a separate but convergently similar tribe, the Basicerotini, which was established by

Brown (1949c). The genera of this tribe, whose members resemble the higher dacetines in many features, were later fully revised by Brown & Kempf (1960), with keyed additions to the Old World fauna by Taylor (1968a).

These pioneering studies of Brown were followed by a series of revisionary papers aimed at single dacetine genera or at the fauna of a particular region, along with many papers describing new species from all over the world. These last are too numerous to list here but the main generic and faunistic studies are as follows.

Acanthognathus, revised by Brown & Kempf (1969); *Epitritus*, keyed by Bolton (1972); *Glamyromyrmex* and *Gymnomyrmex*, keyed by Kempf (1960); *Kyidris*, discussed by Wilson & Brown (1956); *Mesostruma*, first revised by Brown (1952b) with later additions by Taylor (1973); *Neostruma*, revised by Brown (1959b); *Orectognathus*, revised by Brown (1953b) and later also by Taylor (1980, and included references); *Pentastruma*, discussed by Brown & Boisvert (1978); *Serrastruma*, revised by Brown (1952a); *Smithistruma*, revised by Brown (1953a; 1964); *Strumigenys* of the Afrotropical region, revised by Brown (1954), of the Neotropical region, revised by Brown (1962b, and included references), and a continuing series of papers revising the Indo-Australian fauna, the latest being Brown (1973c, and included references). A paper discussing the evolution of the dacetines, which also includes an ecological synopsis of the genera, has been produced by Brown & Wilson (1959). The Polynesian dacetine fauna is keyed by Wilson & Taylor (1967) and the fauna of Japan, China and Taiwan is treated by Brown (1949a). The entire Neotropical fauna has been catalogued by Kempf (1972) and the Nearctic fauna by Krombein *et al.* (1979). Dacetine ant larvae have been investigated by Wheeler & Wheeler (1954).

Apart from short notes included in some of the above references papers dealing with the biology of dacetine ants, either entirely or in part, include those of Brown (1950c), Carlin (1981), Creighton (1937), Dejean (1980a; 1980b), Hölldobler (1981), Kennedy & Schramm (1933), Weber (1952b), Wesson (1936), Wesson & Wesson (1939) and Wilson (1950, 1954, 1962).

On a world-wide basis 27 dacetine genera (384 species) are presently recognized, split into four subtribes which were first proposed and defined by Brown (1952b; 1953a), and later summarized by Brown & Wilson (1959). They are as follows.

Subtribe Dacetiti. Genera in which the eyes are dorsal or lateral and which lack antennal scrobes. The antennae have 11 segments and the palp formula is 5,3. This subtribe includes only the two small Neotropical genera *Daceton* and *Acanthognathus*.

Subtribe Orectognathiti. Contains only the Australian/New Guinean genus *Orectognathus* which has the eyes lateral and lacks antennal scrobes. The antennae have 5 segments and of the four funicular segments the second is the longest. The palp formula is 5,3.

Subtribe Epopostrumiti. The eyes are dorsolateral, placed above the scrobes when such are present. The antennae have 4 or 6 segments and of the funicular segments the second is not the longest. The palp formula is 5,3 or 3,2. Included here are the Afrotropical *Microdaceton* (PF 3,2), and the Australasian *Epopostruma*, *Mesostruma* and *Colobostruma* (all with PF 5,3).

Subtribe Strumigeniti. The eyes are ventrolateral, placed within or beneath the scrobes which are universally present though shallow and reduced in some. The antennae are 4 or 6 segmented and the apical segment is much the longest of the funiculars. The palp formula is 1,1.

This subtribe holds 19 of the 27 genera and is split into two groups based on the presence or absence of a spiniform apical fork on the mandibles. Those genera with the fork are termed strumigeniform (*Strumigenys*, *Neostruma*, *Quadristruma*), those without it smithistrumiform (*Asketogenys*, *Chelystruma*, *Cladarogenys*, *Codiomyrmex*, *Codioxenus*, *Dorisidris*, *Dysedronathus*, *Epitritus*, *Glamyromyrmex*, *Gymnomyrmex*, *Kyidris*, *Pentastruma*, *Serrastruma*, *Smithistruma*, *Tingimyrmex*, *Trichoscapa*). The core-genera of this smithistrumiform group can be regarded as *Smithistruma*, *Trichoscapa* and *Pentastruma* together with their close relatives *Gymnomyrmex*, *Kyidris* and *Tingimyrmex*. In these genera the mandibles tend to be relatively short, basically triangular, dorsoventrally flattened structures which may be quite delicate, are not strongly downcurved, and in which the teeth are relatively small. The maximum number of teeth is usually 12 but rarely may be as high as 19, following a strongly differentiated basal

lamella. Mandibular variation in this complex includes reduction in number of teeth, variation in size and arrangement of teeth, modifications in the development of the basal lamella and the development in some of a diastema, of very variable extent, between the teeth and the basal lamella (Brown, 1948; 1949a; 1953a; 1964; Brown & Boisvert, 1978; Wilson & Brown, 1956; Kempf, 1960).

Modified away from these core-genera are several lines. In one of these the mandibles become more massively constructed and strongly downcurved, and usually accompanying this is a reduction in the number of teeth coupled with an increase in size in the teeth that remain (Brown, 1950a; 1953a). Basal to this complex seem to be *Chelystruma* and *Codiomyrmex* in which the mandibles are enlarged but a more or less full set of teeth is retained. Other genera included here are *Codioxenus*, *Glamyromyrmex* and *Dorisidris*, the last showing a secondary elongation of the mandibles, the second with marked variation in the number of teeth present.

A second line, represented by *Serrastruma* and *Cladarogenys*, shows an elongation of the mandibles but with retention of their basically triangular shape. In these the teeth are initially reduced and incorporated in a long series of denticles. The long basal lamella also becomes denticulate and is pressed into service as part of the masticatory margin (*Serrastruma*; Brown, 1952a). Further elongation of the blades coupled with a secondary reduction in dentition gives the condition seen in *Cladarogenys* (Brown, 1976).

A third line shows elongation of the mandibles with eventual loss of the triangular shape and their development into long narrow blades. This line, including *Dysedrognathus* and *Epitritus*, was postulated by Taylor (1968b). It involves an initial increase in mandible length coupled with an increase in the number of teeth. With continuing increase in length the teeth on the main part of the blade become spaced out or lost and only those crowded near the apex remain.

The last smithistrumiform genus to be considered here, *Asketogenys*, appears to be an independent relatively long-mandibulate derivative of *Smithistruma* in which the teeth at about the midlength of the masticatory margin have been enlarged (Brown, 1972).

Finally there is the anomalous Neotropical genus *Phalacromyrmex* and an apparently related undescribed genus from the Indo-Australian region which do not fit any of the above subtribes. At first glance they appear to fall into the smithistrumiform group but they have 9–11 antennal segments, a palp formula of 3,2 (*Phalacromyrmex*), and lack other characters which may be considered as typically smithistrumiform such as spongiform appendages on the pedicel segments, a transverse lamellar or spongiform strip across the base of the first gastral tergite and a basal lamella on their massively constructed bear trap-like mandibles. Indeed, the massive mandibles seen in these genera are reminiscent of some *Glamyromyrmex* species but also have some resemblance to the Malagasy genus *Pilotrochus* Brown, so there is a very strong possibility that *Phalacromyrmex* and its undescribed relative may be convergent on the smithistrumiform dacetines from some other part of the Myrmicinae.

The distribution of the 27 genera includes all the zoogeographical regions, but dacetines are absent from the northern parts of the Palaearctic and Nearctic. Three of the genera are very widespread (*Smithistruma*, *Strumigenys*, *Epitritus*) and two small genera include efficient tramp-species (*Quadristruma*, *Trichoscapa*) whose members have been introduced by human commerce over much of the tropical and subtropical zones. Of the remaining 22 genera nine are restricted to the Neotropical region, two to the Afrotropical, one to the Oriental, two to the Indo-Australian and two to the Australasian region. The remaining six genera are shared by two, usually adjacent, zoogeographical regions.

The table below summarizes the number of described dacetine species of the world and indicates their distribution. For the purposes of this study the Afrotropical and Malagasy are regarded as separate regions and in the table the Indo Australian region is taken to include New Guinea and the Pacific island systems. Tramp-species or species shared by two regions are entered in the table only in their presumed region of origin. Thus *Serrastruma ludovici* (Forel), *S. simoni* (Emery), *Strumigenys scotti* Forel, *St. rogeri* Emery, *Quadristruma emmae* (Emery), and *Trichoscapa membranifera* (Emery) are all recorded in the Afrotropical column alone, although all have been found in other parts of the world. *Smithistruma dubia* Brown is recorded as Indo-Australian although also present in Australia.

Genus-level names which are now regarded as synonyms are excluded from the table. Apart from those listed in this paper under the appropriate generic headings, the following are recognized synonyms.

Alistruma Brown is a synonym of *Colobostruma*. [Synonymy by Brown, 1959c.]

Arnoldidris Brown is a synonym of *Orectognathus*. [Synonymy by Brown, 1973b.]

Clarkistruma Brown is a synonym of *Colobostruma*. [Synonymy by Brown, 1959c.]

Hexadaceton Brown is a synonym of *Epopostruma*. [Synonymy by Brown, 1973b.]

Polyhomoa Azuma is a synonym of *Kyidris*. [Synonymy by Brown & Yasumatsu, 1951.]

The fossil genus *Hypopomyrmex* Emery, formerly considered a dacetine, has been re-examined by Brown & Carpenter (1978) and excluded from the tribe.

In the table the zoogeographical regions are abbreviated as follows. Af. Afrotropical, Au. Australasian, In. Indo-Australian, Ma. Malagasy, Ne. Nearctic, No. Neotropical, Or. Oriental, Pa. Palaearctic.

Genus	Ne.	No.	Pa.	Af.	Ma.	Or.	In.	Au.	Total
<i>Acanthognathus</i> Mayr	—	6	—	—	—	—	—	—	6
<i>Asketogenys</i> Brown	—	—	—	—	—	—	1	—	1
<i>Chelystruma</i> Brown	—	1	—	—	—	—	—	—	1
<i>Cladarogenys</i> Brown	—	—	—	1	—	—	—	—	1
<i>Codiomymex</i> Wheeler	—	2	—	—	—	—	—	2	4
<i>Codioxenus</i> Santschi	—	1	—	—	—	—	—	—	1
<i>Colobostruma</i> Wheeler	—	—	—	—	—	—	1	8	9
<i>Daceton</i> Perty	—	1	—	—	—	—	—	—	1
<i>Dorisidris</i> Brown	—	1	—	—	—	—	—	—	1
<i>Dysedrognathus</i> Taylor	—	—	—	—	—	—	1	—	1
<i>Epitritus</i> Emery	—	—	1	4	—	1	1	—	7
<i>Epopostruma</i> Forel	—	—	—	—	—	—	—	4	4
<i>Glamyromymex</i> Wheeler	—	7	—	11	—	—	—	—	18
<i>Gymnomymex</i> Borgmeier	—	6	—	—	—	—	—	—	6
<i>Kyidris</i> Brown	—	—	—	—	—	2	2	—	4
<i>Mesostruma</i> Brown	—	—	—	—	—	—	—	6	6
<i>Microdaceton</i> Santschi	—	—	—	2	—	—	—	—	2
<i>Neostruma</i> Brown	—	6	—	—	—	—	—	—	6
<i>Orectognathus</i> Smith	—	—	—	—	—	—	10	19	29
<i>Pentastruma</i> Forel	—	—	—	—	—	2	—	—	2
<i>Phalacromymex</i> Kempf	—	1	—	—	—	—	—	—	1
<i>Quadristruma</i> Brown	—	—	—	1	—	—	1	—	2
<i>Serrastruma</i> Brown	—	—	—	11	—	—	—	—	11
<i>Smithistruma</i> Brown	24	19	3	35	—	5	11	—	97
<i>Strumigenys</i> Smith	1	54	—	41	1	8	48	8	161
<i>Tingimymex</i> Mann	—	1	—	—	—	—	—	—	1
<i>Trichoscapa</i> Emery	—	—	—	1	—	—	—	—	1
Total	25	106	4	107	1	18	76	47	384

Discounting papers whose sole purpose was the mass description of new forms the history of Afrotropical dacetine studies prior to Brown's (1948) publication consisted only of the monographic study of South African ants by Arnold (1917), the catalogue of Wheeler (1922) and the key presented by Santschi (1913a). Arnold and Wheeler both recognized three genera in the Afrotropical region, *Microdaceton*, *Strumigenys* and *Epitritus*, of which only the first has remained unchanged to the present day.

The genus *Strumigenys*, as recognized by Wheeler (1922), contained not only the long-mandibulate forms with a spiniform apical fork which constitute the genus as it is presently understood, but also a number of short-mandibulate species which lacked an apical fork and which were grouped under a subgenus *Cephaloxys*. Brown (1948) recognized that these short-mandibulate forms were fundamentally different from the foregoing group and also noted

that *Cephaloxys*, beside being a preoccupied name, itself contained two disparate groups of species which differed consistently in the structure of their mandibles. Erecting *Smithistruma* to replace the name *Cephaloxys*, Brown (1948) proceeded to remove those African species which had multi-denticulate mandibles to a separate subgenus of *Smithistruma*, *Serrastruma*, which he later elevated to generic status (Brown, 1949a) and then revised both genera (Brown, 1952a, 1953a).

The two African species placed in *Epitritus* by their original authors and retained there by Wheeler (1922) were recognized by Brown (1948) as falling outside the limits of that genus. He transferred them to a separate genus, *Miccostruma*, which is now regarded as a synonym of *Smithistruma* (see discussion of that genus). True *Epitritus* was later discovered in Africa (Brown, 1962a) and four species are now known from that continent. Brown (1953a) described a species of *Codiomyrmex* from Africa, and Taylor (1965) another. These two, plus nine newly discovered species, are best referred to *Glamyromyrmex* as noted under the discussion of that genus. Finally, species of *Quadristruma* and *Trichoscapa* have been recorded from Africa, the former by Bolton (1973), the latter newly reported here; and the monotypic genus *Cladarogenys* has recently been described by Brown (1976).

Thus the Afrotropical region currently has nine dacetine genera containing a total of 107 species. The vast majority of these are found in the leaf litter and topsoil layers where they constitute an important fraction of the fauna. Nests are made either in compressed leaf litter, in the soil, or in pieces of wood or stumps embedded in the litter and topsoil layers. A couple of *Strumigenys* species are known which nest and forage arboreally and some *Serrastruma* may ascend tree trunks to a considerable distance above the ground.

This study of the dacetine ants of sub-Saharan Africa is the latest part in a series of papers aimed towards a revision of the entire myrmicine ant fauna of the Afrotropical region. Previously published parts include Bolton (1974; 1976; 1980; 1981a; 1981b; 1982).

Measurements and indices

Total Length (TL). The total outstretched length of the ant from the mandibular apex to the gastral apex.

Head Length (HL). The length of the head proper, excluding the mandibles, measured in a straight line from the mid-point of the anterior clypeal margin to the mid-point of the occipital margin, in full-face view. In species where the clypeal margin or the occipital margin (or both) is concave the measurement is taken from the mid-point of a transverse line spanning the anteriormost or posteriormost projecting points respectively.

Head Width (HW). The maximum width of the head in full-face view, measured behind the eyes. (In *Microdaceton* ignoring the projecting tubercles.)

Cephalic Index (CI).
$$\frac{HW \times 100}{HL}$$

Mandible Length (ML). The straight-line length of the mandible, measured in the same plane for which the HL measurement is taken, from the mandibular apex to the transverse through the anteriormost point or points of the clypeal margin.

Mandibular Index (MI).
$$\frac{ML \times 100}{HL}$$

Scape Length (SL). The maximum straight-line length of the antennal scape excluding the basal constriction or neck close to the condylar bulb. (In *Epitritus* measured from the tip of the subbasal lobe to the scape apex.)

Scape Index (SI).
$$\frac{SL \times 100}{HW}$$

Pronotal Width (PW). The maximum width of the pronotum in dorsal view.

Alitrunk Length (AL). The diagonal length of the alitrunk in profile from the point at which the pronotum meets the cervical shield to the posterior base of the metapleuron.

Abbreviations of depositories

AMNH	American Museum of Natural History, New York, U.S.A.
BMNH	British Museum (Natural History), London, U.K.
CAS	California Academy of Sciences, San Francisco, California, U.S.A.
ENSA	École Nationale Supérieure Agronomique, Toulouse, France.
IE	Istituto di Entomologia dell'Università, Bologna, Italy.
MCSN	Museo Civico di Storia Naturale 'Giacomo Doria', Genoa, Italy.
MCZ	Museum of Comparative Zoology, Cambridge, Massachusetts, U.S.A.
MHN	Muséum d'Histoire Naturelle, Geneva, Switzerland.
MNHN	Muséum National d'Histoire Naturelle, Paris, France.
MNHU	Museum für Naturkunde der Humboldt-Universität, Berlin, Germany (D.D.R.).
MRAC	Musée Royal de l'Afrique Centrale, Tervuren, Belgium.
NMB	Naturhistorisches Museum, Basle, Switzerland.
NMV	Naturhistorisches Museum, Vienna, Austria.
SAM	South African Museum, Cape Town, South Africa.
TM	Természettudományi Múzeum, Budapest, Hungary.
USNM	United States National Museum, Washington, D.C., U.S.A.

Diagnosis of Afrotropical dacetine ants

WORKER. Myrmicine ants in which the antennae have only 4 or 6 segments, the funiculus ending in a 2-segmented club. Pedicel segments with spongiform or lamelliform appendages; sometimes the appendages small but always present (Figs 13, 16, 22, 30, 38–44, 68–70, 77, 78, 80, 81). Mandibles of two basic forms, either produced into a pair of long narrow linear blades (Figs 45–67, 71–79) with or without an apical fork of spiniform teeth, or the mandibles shorter, usually subtriangular, always lacking an apical fork and armed with 8–>30 teeth or denticles (Figs 1–12, 14, 15, 17–21, 23–37). Clypeus broad and shield-like, broadly inserted between the widely separated frontal lobes; the latter sometimes projecting beyond the lateral margins of the head. Palp formula usually 1,1 but higher in *Microdaceton* (PF 3,2). Antennal scrobes usually present (not in *Microdaceton*, Figs 78, 79), situated above the eye, the latter generally small to moderate in size and commonly on the ventrolateral margin of the head. Propodeum usually with a pair of teeth or spines, rarely otherwise. Bizarre pilosity frequently developed.

Among the Afrotropical myrmicine ants the dacetines are easily identified by their low antennomere count of 4 or 6 and their possession of spongiform or lamellate appendages on the pedicel segments. Only one other genus in the region has an antennomere count as low as 6, *Melissotarsus* Emery, but this differs from the dacetine genera as follows.

Dacetine genera	<i>Melissotarsus</i>
Spongiform or lamellate appendages present on pedicel segments.	Spongiform or lamellate appendages absent from pedicel segments.
Frontal lobes widely separated, situated laterally on anterior half of head.	Frontal lobes confluent, situated centrally and high on dorsum of head.
Clypeus projecting back between frontal lobes.	Clypeus not projecting back between frontal lobes.
Mandibles blade-like or subtriangular; if the latter then always with more than 4 teeth.	Mandibles short, at most with 4 teeth, the apical long and finger-like when unworn.
Antennal scrobes present except in <i>Microdaceton</i> but here the mandibles are linear.	Antennal scrobes absent.
Propodeum usually armed with a pair of spines or teeth, often with a strong infradental lamella.	Propodeum evenly rounded and unarmed.
Anterior coxae as large as or larger than the middle and hind coxae.	Anterior coxae much smaller than the massively developed middle and hind coxae (Bolton, 1982: 334, fig. 23).

Dacetine genera – *cont.*

Basitarsal leg segments not swollen,
without an apical circlet of teeth
on the anterior edge of the middle
and hind basitarsi.

Melissotarsus – *cont.*

Basitarsal leg segments greatly swollen,
with an apical circlet of teeth on
the anterior edge of the middle
and hind basitarsi.

Key to Afrotropical dacetine ant genera (workers)

- 1 Mandibles elongate and linear, produced into narrow projecting blades (Figs 45–67, 71–79):
never triangular/subtriangular, never serially multidentate or denticulate 2
- Mandibles triangular or subtriangular, not produced into narrow projecting blades; apical
(masticatory) margin serially multidentate or denticulate but teeth sometimes reduced
(Figs 1–15, 17–37) 6
- 2 Apex of each mandibular blade armed with a fork of 2 or 3 spiniform teeth set in a more or less
vertical series, with or without intercalary denticles between the spiniform fork teeth
(Figs 49–67, 71–79) 3
- Apex of each mandibular blade either with a single long tooth at the dorsal apex subtended by a
series of minute denticles, or with a series of minute denticles only (Figs 45–48) 5
- 3 Apical fork of mandibles with 3 spiniform teeth; blades of mandibles without preapical teeth.
Maxillary palp 3-segmented. Antennal scrobes absent, the eyes dorsolateral. Petiole node
with a pair of teeth or short spines, postpetiole with lamellate appendages (Figs 78–81)
MICRODACETON (p. 401)
- Apical fork of mandibles with 2 spiniform teeth; blades of mandibles usually with preapical
teeth. Maxillary palp 1-segmented. Antennal scrobes present, the eyes ventrolateral. Petiole
node unarmed, postpetiole with spongiform appendages (Figs 49–77) 4
- 4 Antennae with 4 segments (Fig. 67) *QUADRISTRUMA* (p. 400)
- Antennae with 6 segments *STRUMIGENYS* (p. 358)
- 5 Antennal scapes with a broad anteriorly projecting subbasal lobe. Clypeal margin with spatulate
or strap-like projecting hairs. Head with large orbicular hairs present; the head broad,
CI>100 (Figs 46–48) *EPITRITUS* (p. 354)
- Antennal scapes linear, without a projecting lobe. Clypeal margin without spatulate or
strap-like projecting hairs. Head only with simple hairs present; the head narrower, CI<80
CLADAROGENYS (p. 353)
- 6 Differentiated prominent basal lamella of mandible absent. Apical (masticatory) margin of
mandible with >20 denticles, the basal 4–8 of which may be enlarged. Mandibles relatively
long, MI>25 (Figs 34–37) *SERRASTRUMA* (p. 335)
- Differentiated prominent basal lamella of mandible present. Apical (masticatory) margin of
mandible with 17 or fewer teeth or denticles of varying size. Mandibles relatively short,
MI<25 (Figs 1–15, 17–33) 7
- 7 Fully closed mandibles with a strongly defined transverse basal border which is separated
from the anterior clypeal margin by a conspicuous impression or gap (Fig. 21). Basal
lamella of mandible situated ventral to the basalmost tooth, in a plane almost at right-
angles to the anterior portion of the mandible, not visible in full-face view with the mandibles
open *TRICHOSCAPA* (p. 319)
- Fully closed mandibles without a strongly defined basal border, the basal region of the mandible
contiguous with or overlapped by the anterior clypeal margin, the two not separated by an
impression or gap (Figs 1–12, 14, 15, 17–20, 23–29). Basal lamella of mandible following
basalmost tooth in the same plane, visible in full-face view with the mandibles open 8
- 8 With the head in profile the mandibles increasing in width from base to apex and the distal
portion of the blades passing into a strong downcurved arc so that part or most of the apical
margin is at right-angles to the long axis of the head (Figs 30–33). Masticatory margin of
mandible armed with a basal lamella plus 8–11 teeth, the basal 5–8 of which may be very strong
(Figs 23–29) *GLAMYROMYRMEX* (p. 320)
- With the head in profile the mandibles with their upper and lower margins approximately
parallel for most of their length or evenly tapering anteriorly. At most the extreme tip
of the mandible downcurved, without a major part of the apical margin at right-angles to
the long axis of the head (Fig. 13). Masticatory margin of mandible armed with a basal
lamella plus 12–17 teeth or denticles, the apicalmost group of which are minute (Figs 1–12, 14,
15, 17–20) *SMITHISTRUMA* (p. 274)

SMITHISTRUMA Brown

(Figs 1–20)

- Cephaloxys* F. Smith, 1865: 76. Type-species: *Cephaloxys capitata* F. Smith, 1865: 77, by monotypy. [Junior homonym of *Cephaloxys* Signoret, 1847: 294 (Hemiptera).]
- Smithistruma* Brown, 1948: 104. Type-species: *Strumigenys pulchella* Emery, 1895b: 327, pl. 8, fig. 19, by original designation.
- Wessonistruma* Brown, 1948: 106 [as subgenus of *Smithistruma*]. Type-species: *Strumigenys pergandei* Emery, 1895b: 326, pl. 8, figs 17, 18, by original designation. [Synonymy by Brown, 1973a: 35.]
- Weberistruma* Brown, 1948: 106 [as subgenus of *Smithistruma*]. Type-species: *Strumigenys (Cephaloxys) leptothrix* Wheeler, 1929: 55, fig. 7, by original designation. [Synonymy by Brown, 1973a: 35.]
- Miccostruma* Brown, 1948: 123. Type-species: *Epitritus mandibularis* Szabo, 1909: 1, fig. 2, by original designation. **Syn. n.**
- Platystroma* Brown, 1953a: 112 [as subgenus of *Smithistruma*]. Type-species: *Strumigenys (Cephaloxys) depressiceps* Weber, 1934: 47, fig. 6, by original designation. [Synonymy by Brown, 1973a: 35.]

DIAGNOSIS OF WORKER. Afrotropical dacetine ants. Mandibles triangular to narrowly subtriangular and short (MI 7–20), serially dentate or denticulate and lacking an apical fork of spiniform teeth. When fully closed at least the base of the mandible, but sometimes much of its length, concealed by the clypeus; without a sharply defined transverse basal margin which is separated from the anterior clypeal margin by a conspicuous impression or gap. In profile the mandibles with their upper and lower margins approximately parallel for most of their length or evenly tapering anteriorly (Fig. 13), at most with the tip of the mandible downcurved, never with a major part of the apical (masticatory) margin strongly arched-downcurved or at right-angles to the long axis of the head. Apical (masticatory) margin of the mandible with 12–17 teeth following a conspicuously differentiated prominent basal lamella, the lamella concealed by the clypeus when the mandibles are closed. Arrangement of teeth either with 5 larger members, distal to the basal lamella, forming a principal tooth row in which the teeth may be about the same or of different sizes; these followed by two somewhat smaller teeth and a series of 4 minute denticles before the apical tooth or denticle; or with a principal row of 7 teeth followed by 4 minute denticles and an apical tooth or denticle; or with a principal row of 7–8 teeth separated from the basal lamella by a long diastema, the distal member of this series by far the largest tooth on the mandible and followed sequentially by 3 small teeth, a slightly larger tooth, 4 denticles and an apical tooth.

Species of *Smithistruma* have been described from all the zoogeographical regions except the Australian and Malagasy. Undescribed species from the latter region are represented in the BMNH and MCZ, Cambridge collections, but the genus is represented in the Australian region only by the introduced *S. dubia* Brown (R. W. Taylor, pers. comm.). On a worldwide basis 97 *Smithistruma* species have been described, of which 35 are Afrotropical. As indicated in the table of dacetine species presented in the introduction to this paper (p. 270), all other zoogeographical regions now fall behind the Afrotropical in terms of number of *Smithistruma* species, but this picture is somewhat distorted as many new species from other regions await description in the museums of the world.

The modern taxonomic study of *Smithistruma* dates back only to 1953 when Brown (1953a) published a world revision of the genus as it was then understood, having previously defined the genus and a number of subgenera in an earlier introductory paper (Brown, 1948). Later Brown (1964) produced a supplement to the world revision and subsequently indicated (Brown, 1973a) that the subgenera should be regarded as synonyms of *Smithistruma*, except for *Serrastruma* which he had previously raised to generic status (Brown, 1949a). The collapse of the subgenera was due solely to the continuing discovery of species linking groups which originally seemed quite distinct, and this process is still in operation as species reducing or bridging the gaps between many of the genera of short-mandibulate dacetines continue to be found. Indeed, the position of *Smithistruma* itself is not assured. It stands central to, and is the largest single member of, a group of closely related mostly small genera of dacetines with short mandibles which also includes *Pentastruma*, *Trichoscapa*, *Tingimymex*, *Kyidris*, *Chelystruma*, *Codiomyrmex*, *Codioxenus*, *Dysedrognathus*, *Glomyrmex* and *Gymnomyrmex*. Closely linked to these are a number of forms with more specialized and usually longer mandibles which appear to be derived from various members of the *Smithistruma*-group, namely *Asketogenys*, *Serrastruma*, *Cladarogenys*, *Dorisidris* and *Epitritus*. In recent years Brown (1973a) and Brown &

Boisvert (1978) have discussed a number of these names and generally concluded that *Serrastruma*, *Tingimyrme*, *Epitritus* and *Kyidris* are valid genera, but that the remainder are dubious and in a state of flux as modern collecting techniques continue to reveal previously unknown species which are gradually filling the gaps originally invoked to separate the genera.

In the present paper a single generic name, *Miccostruma*, is newly synonymized with *Smithistruma*. *Miccostruma* was originally erected by Brown (1948) to include two Afrotropical species, *mandibularis* and *marginata*, which had both been regarded previously as members of *Epitritus*; later Brown (1973a) added a third species, *tigrilla*. The characters which Brown used to separate *Miccostruma* from *Smithistruma* were the possession of 4-segmented antennae and relatively very short mandibles by the former, as opposed to 6-segmented antennae and longer mandibles in the latter. With the description of *S. cavinasis* by Brown (1950b) it became apparent that species with 6-segmented antennae could also have very short mandibles, as Brown (1953a) mentioned in his world revision. This discovery seriously eroded the strength of the character and the present survey has indicated that it has no value at genus level as short mandibles (MI 10 or less) are by no means confined to species with 4-segmented antennae but occur in a wide range of forms from several species-groups.

Concerning the reduced antennal segmentation Brown (1973a) has already pointed out that it is a weak character as the fusion of segments which takes place to reduce the antennomere count is not always complete. In *tigrilla*, with correct lighting, the limits of the former segments 3–5, which fuse to form segment 3 in *tigrilla*, can be seen. At present seven Afrotropical species with 4-merous antennae are known. An analysis of their characters indicates that the reduction in antennal segmentation from 6 to 4 has occurred in three separate lines derived from different groups within *Smithistruma*. Of these species with 4-merous antennae *fulda*, *mandibularis*, *ninda* and *tigrilla* form a single group which is very closely related to, and most probably directly descended from, the *emarginata*-group. In these four species the clypeus is broad and prominent anteriorly and laterally, is fringed by a continuous row of large specialized hairs and has the anterior margin concave; the mandibles have a high truncated-triangular basal lamella and a principal tooth row of 5. Body pilosity is extremely sparse or absent and flagellate hairs are lacking, but the leading edges of the scapes have projecting strong specialized hairs. The pronotum lacks both lateral margination and a median dorsal longitudinal carina.

Compared to these fundamental shared characters of *mandibularis* and its allies the other three species with 4-merous antennae are very different. In *marginata* the clypeus lacks hairs of any description, has the anterior margin broadly convex and the sides parallel. The mandibles have the basal lamella shaped as a long low lobe and have a principal tooth row of 7. Body pilosity is present and long flagellate hairs occur on the head and alitrunk, but the leading edges of the scapes lack projecting hairs. The pronotum is sharply marginate laterally and has a strong median carina. *S. tacta* and *vodensa* share most of the characters of *marginata* but have the clypeus differently constructed. In *tacta*-group the clypeus is narrow, has convergent sides with a produced and narrowly rounded anterior margin, and is densely clothed with fine hairs. *S. marginata* and *tacta* share more characters between them than either one does with *mandibularis* and its allies, but the fundamental difference in clypeal form indicates that they have arisen from separate origins within *Smithistruma*.

The disparity of these species-group level characters, between *mandibularis* and its allies on the one hand and *marginata* on the other, shows that *Miccostruma* contained, from its inception, elements from fundamentally different origins within *Smithistruma*. The discovery of *tacta* and *vodensa*, from yet another group, makes it clear that reduction in antennomere count has little or no value at genus level amongst the short-mandibulate dacetines. The removal of *marginata* from *Miccostruma* does leave a uniform group of species centring on *mandibularis*, but the overwhelming similarity of these species to the members of the *emarginata*-group, and the collapse of the original separating characters of *Miccostruma*, confirms that the species can no longer be regarded as constituting a separate genus.

All known Afrotropical species of *Smithistruma* inhabit the leaf litter and topsoil layers, usually nesting directly into the ground or in rotten wood. No species is remarkably common and collections of many species are only of a few individual workers. In recent years increased

collecting by funnelling techniques has shown that *Smithistruma* is by no means as poorly represented in Africa as was thought only a few years ago, and many more species probably await discovery; but as Brown (1952a, 1953a) has pointed out, *Smithistruma* in Africa is more or less eclipsed by the much more common, widely distributed and versatile species of *Serrastruma* which, though having fewer species, greatly outnumber *Smithistruma* in terms of numbers of individuals.

List of Afrotropical *Smithistruma*

mandibularis-group

- fulda* sp. n.
- mandibularis* (Szabo) comb. n.
- ninda* sp. n.
- tigrilla* (Brown) comb. n.

emarginata-group

- behasyla* sp. n.
- cavinasis* Brown
- chyatha* sp. n.
- datissa* sp. n.
- dendexa* sp. n.
- emarginata* (Mayr)
- gatuda* sp. n.
- hensekta* sp. n.
- impidora* sp. n.
- sharra* sp. n.
- truncatidens* Brown

transversa-group

- transversa* (Santschi)

terrioni-group

- terrioni* sp. n.

weberi-group

- arahana* sp. n.
- enkara* sp. n.
- fenkara* sp. n.
- kerasma* sp. n.
- malaplax* sp. n.
- mekaha* sp. n.
- minkara* sp. n.
- nykara* sp. n.
- placora* sp. n.
- synkara* sp. n.
- tolomya* sp. n.
- weberi* Brown

marginata-group

- marginata* (Santschi) comb. n.
- rusta* sp. n.

oxysma-group

- anarta* sp. n.
- oxysma* sp. n.

tacta-group

- tacta* sp. n.
- vodensa* sp. n.

Key to species (workers)

- 1 Antennae with 4 segments 2
- Antennae with 6 segments 8
- 2 Anterior clypeal margin convex in full-face view (Fig. 20). Pronotum with a median longitudinal carina and pronotal humeri each with a single flagellate hair 3
- Anterior clypeal margin concave in full-face view (Figs 1, 2). Pronotum without a median longitudinal carina and pronotal humeri without flagellate hairs 5
- 3 Clypeus broad, in full-face view expanded laterally far beyond the line of the outer margins of the closed mandibles (shaped as in Fig. 17). Dorsum of clypeus without hairs. (Ivory Coast, Kenya, Zimbabwe) *marginata* (p. 312)
- Clypeus narrow, in full-face view more or less continuing the line of the outer margins of the closed mandibles (Fig. 20). Dorsum of clypeus with abundant short curved hairs 4
- 4 Pronotum sharply marginate laterally, the dorsum unsculptured. Head relatively broad and scapes short, CI>60, SI<75. (Ivory Coast, Ghana, Cameroun, Zaire) *tacta* (p. 317)
- Pronotum not marginate laterally, the dorsum weakly sculptured. Head relatively narrow and scapes long, CI<60, SI>100. (Cameroun) *vodensa* (p. 317)
- 5 Entire body coloured with broad alternating yellow and black transverse bands. Basigastral costulae arising in a continuous row across the tergite, without a central gap. (Ivory Coast, Cameroun) *tigrilla* (p. 284)
- Body uniformly coloured, without alternating yellow and black broad transverse bands. Basigastral costulae radiating from each side of a central gap 6
- 6 With the head in profile the dorsum with a pair of short erect hairs close to the occipital margin. (Kenya, Tanzania, Angola) *mandibularis* (p. 283)
- With the head in profile the dorsum without erect hairs 7
- 7 Anterior half of clypeus with a broad longitudinal impression mid-dorsally which is filled with short scale-like hairs, these hairs directed towards the midline. Subbasal elbows of scapes

- extensively developed and strongly angular (Fig. 1). Pronotal dorsum with dense fine longitudinal rugulae or costulae. (Ivory Coast) **fulda** (p. 282)
- Anterior half of clypeus without an impression mid-dorsally, this area without short scale-like hairs directed towards the midline. Subbasal elbows of scapes weakly developed, evenly rounded and not angled (Fig. 2). Pronotal dorsum smooth or at most with faint superficial shagreening on the glossy surface. (Ivory Coast, Ghana, Nigeria, Chad, Cameroun) **ninda** (p. 284)
- 8 Dorsum of pronotum extremely coarsely sculptured with strong rugae or sulci which are close packed and give a very coarse overall appearance; without broad shining areas between the rugae or sulci 9
- Dorsum of pronotum varying from smooth to densely reticulate-punctate. Feeble striate sculpture or extremely fine superficial rugulae may occur but coarse rugae or sulci are always absent 20
- 9 Disc of postpetiole densely and strongly longitudinally costulate 10
- Disc of postpetiole smooth and unsculptured or at most uneven and feebly punctate, never longitudinally costulate 12
- 10 Head exceptionally long and narrow, CI 54–58 (Fig. 14); antennal scapes relatively long, SI 73–78. (Ivory Coast) **minkara** (p. 306)
- Head shorter and broader, CI >60; antennal scapes relatively short, SI 68–73 11
- 11 Disc of postpetiole in dorsal view surrounded on all sides by dense spongiform material. Transverse spongiform strips behind petiole and postpetiole broad and complete. Pronotal dorsum coarsely longitudinally rugose. (Ivory Coast, Ghana, Cameroun) **enkara** (p. 301)
- Disc of postpetiole in dorsal view with spongiform material only developed posteriorly and posterolaterally. Transverse spongiform strips behind petiole and postpetiole interrupted medially. Pronotal dorsum irregularly reticulate-rugose. (Zimbabwe) **nykara** (p. 307)
- 12 With the alitrunk in profile the metanotal groove distinctly impressed. (Fig. 16) 13
- With the alitrunk in profile the metanotal groove not impressed, the dorsal outline continuous 15
- 13 Posterior spongiform margin of postpetiole very deeply indented medially, the indentation reaching to the margin of the disc. (Zaire) **weberi** (p. 311)
- Posterior spongiform margin of postpetiole very shallowly indented medially, the indentation not approaching the margin of the disc, always a thick band of spongiform material remaining between the margin of the disc and the innermost point of the indentation in the spongiform tissue 14
- 14 Hairs on dorsum of head strongly arched forward so that their apices are in contact or almost in contact with the surface, without hairs which are erect and sharply angled at about their midlengths. (Cameroun) **mekaha** (p. 305)
- Hairs on dorsum of head, especially on posterior half, with the basal half to two-thirds erect, the apical portion of each hair sharply angled forward. (Cameroun) **kerasma** (p. 303)
- 15 Dorsum of head behind clypeus only with fine soft flexuous looped or arched simple hairs, without specialized strong hairs which are similar to those on the clypeal dorsum. (Nigeria, Zaire, Angola) **malaplast** (p. 304)
- Dorsum of head behind clypeus usually with some fine hairs but also with long stout very conspicuous hairs which are erect and curved anteriorly and which are similar to those on the clypeal dorsum 16
- 16 With the head in profile the longest hairs arising from the clypeal dorsum (the posteriormost row) at most only half the length of the longest hairs on the cephalic dorsum, which arise just behind the level of the eyes. (Cameroun) **placora** (p. 308)
- With the head in profile the longest hairs arising from the clypeal dorsum about the same length as those situated on the cephalic dorsum just behind the level of the eyes, or only fractionally different 17
- 17 Posterior spongiform strip of petiole enormously developed, in dorsal view the thickness of the strip from front to back greater than the exposed length of the petiole node; in appearance the strip obviously densely spongiform rather than lamellar. (Cameroun) **arahana** (p. 300)
- Posterior spongiform strip of petiole narrow and lamellar, in dorsal view the thickness of the strip from front to back conspicuously less than the exposed length of the petiole node 18
- 18 With the head in posterior view the long hairs arising from the dorsum and sides distinctly swollen apically, increasing markedly in width from base to apex. (Angola) **fenkara** (p. 302)
- With the head in posterior view the long hairs arising from the dorsum and sides of uniform width throughout their length, not increasing in width from base to apex 19

- 19 Median indentation in posterior margin of the spongiform strip bordering the postpetiole posteriorly not reaching the sclerotized portion of the disc. Larger species, HW 0.50. (Gabon)..... *synkara* (p. 309)
- Median indentation in posterior margin of the spongiform strip bordering the postpetiole posteriorly reaching to the sclerotized portion of the disc. Smaller species, HW <0.40. (Cameroun)..... *tolomyia* (p. 310)
- 20 Pronotal humeri each with a single long flagellate hair, the pronotal dorsum with a median longitudinal ridge or carina, at least anteriorly. Leading edges of scapes lacking anteriorly projecting strong hairs, those present being short and appressed. Anterior margin of clypeus convex in full-face view and the lateral clypeal margins lacking a continuous fringe of anteriorly curved spatulate or spoon-shaped hairs (Figs 17–19) 21
- Pronotal humeri without flagellate hairs, the pronotal dorsum without a median longitudinal ridge or carina. Leading edges of scapes with a row of anteriorly projecting strong hairs. Anterior margin of clypeus transverse to concave in full-face view and the lateral clypeal margins with a continuous fringe of anteriorly curved spatulate or spoon-shaped hairs (Figs 3–12)..... 23
- 21 Clypeal dorsum in profile without hairs. In full-face view the anterior clypeal margin broadly and evenly convex; sides of clypeus approximately parallel, not forming a more or less continuous line with the outer margins of the closed mandibles (Fig. 17). (Zimbabwe)..... *rusta* (p. 313)
- Clypeal dorsum in profile with posteriorly or posteromedially curved hairs which are weakly clavate apically. In full-face view the anterior clypeal margin narrowly convex; sides of clypeus converging anteriorly and forming a more or less continuous line with the outer margins of the closed mandibles (Figs 18, 19)..... 22
- 22 Elongate hairs on first gastral tergite restricted to a transverse row of four close to the base. Flagellate hairs absent from upper scrobe margins (Fig. 18). (South Africa)..... *anarta* (p. 314)
- Elongate hairs on first gastral tergite numbering 12 or more, not restricted to area close to the base. Two or three flagellate hairs present on each upper scrobe margin (Fig. 19). (South Africa, Lesotho) *oxysma* (p. 315)
- 23 Mandibles with 12 teeth of which one of the basal row of five is the largest. From the base to the apex the mandible with five relatively large teeth followed by two slightly smaller teeth, four minute denticles and a small apical tooth. Diastema between basal lamella and basalmost tooth minute or absent, always smaller than the height of the basalmost tooth (Figs 3–6, 8–12)..... 24
- Mandibles with 16–17 teeth of which the seventh or eighth from the base is by far the largest. From the base to the apex the mandible with six or seven small teeth followed by a relatively very large tooth, three small teeth, a single slightly larger tooth, four minute denticles and an apical tooth. Diastema between basal lamella and basalmost tooth long, distinctly much longer than the height of the basalmost tooth (Fig. 7). (Cameroun) *terronei* (p. 299)
- 24 With the head in full-face view the entire dorsum with large flattened very broadly scale-like to suborbicular hairs (Fig. 3) 25
- With the head in full-face view the dorsum without large flattened broadly scale-like to suborbicular hairs or at most with such hairs occurring in one or two sharply defined transverse bands 26
- 25 Postpetiole and first gastral tergite with erect hairs present. CI 63–67. Scale-like hairs inconspicuous or absent on disc of postpetiole. (Cameroun, Zaire, Angola) *cavinasis* (p. 287)
- Postpetiole and first gastral tergite without erect hairs. CI 56–63. Scale-like hairs sparse but obvious on disc of postpetiole. (Ivory Coast, Ghana, Cameroun, Angola)..... *sharra* (p. 295)
- 26 First gastral tergite without standing hairs 27
- First gastral tergite with standing hairs which are usually numerous but which may be restricted to a single basal pair and a single apical pair 28
- 27 Dorsum of head with a transverse band of broadly scale-like to suborbicular hairs just in front of the occipital margin (Fig. 5). (Ghana) *chyatha* (p. 288)
- Dorsum of head lacking hairs of any description except for the fringe around the clypeal margins (Fig. 6). (Ivory Coast) *impidora* (p. 294)
- 28 Base of first gastral tergite sharply impressed medially, the sclerite with a dented appearance. Scapes relatively long, SI 72–80 (Fig. 8). (Ivory Coast, Ghana, Togo, Burundi, Zimbabwe, Angola, South Africa) *emarginata* (p. 291)
- Base of first gastral tergite not impressed medially. Scapes shorter, SI 58–67 (Figs 4, 9–12) 29

- 29 Pronotal disc glassy smooth between very widely scattered small punctures. (Rwanda)
 – Pronotal disc uniformly closely sculptured, subopaque to opaque *gatuda* (p. 292) 30
- 30 Dorsum of head in full-face view with a transverse band of broadly scale-like hairs in front of the occipital margin and another just behind the level of the frontal lobes (Fig. 4). (Cameroun)..... *behasyla* (p. 286)
- Dorsum of head in full-face view without two bands of broadly scale-like hairs as described above 31
- 31 With the head in full-face view the lateral margins behind the level of the eyes with conspicuous freely projecting hairs (Figs 10, 12) 32
- With the head in full-face view the lateral margins behind the level of the eyes without freely projecting hairs or at most with a single short hair at the scrobal apex; any other hairs present are strongly curved anteriorly and closely applied to the surface, not freely projecting (Fig. 9) 34
- 32 Anterior clypeal margin transverse (Fig. 12). Dorsal alitrunk with six or seven pairs of erect hairs. Base of first gastral tergite with a broad transverse spongiform strip, the basigastral costulae commencing behind the strip and not impinging upon it. (Ivory Coast, Ghana, Cameroun, Gabon, Angola) *hensekta* (p. 293)
- Anterior clypeal margin concave (Fig. 10). Dorsal alitrunk with one or two pairs of erect hairs. Base of first gastral tergite with a transverse lamellate strip, the basigastral costulae running across the strip to the basal margin 33
- 33 Pronotal dorsum punctate. Slightly larger species, HW 0.46–0.54. (Rwanda, Burundi, Kenya, Tanzania)..... *truncatidens* (p. 296)
- Pronotal dorsum finely longitudinally rugulose. Slightly smaller species, HW 0.40. (Cameroun)..... *dendexa* (p. 290)
- 34 Dorsum of postpetiole finely longitudinally costulate. Infradental lamella of propodeum reduced to a mere carina on each side. Larger and with broader head, HW 0.54, CI 77 (Fig. 9). (Rwanda)..... *datissa* (p. 289)
- Dorsum of postpetiole unsculptured and smooth. Infradental lamella of propodeum broad and conspicuous. Smaller and with narrower head, HW 0.42–0.46, CI 68–71. (South Africa) *transversa* (p. 297)

The species-groups

The 35 known Afrotropical species of *Smithistruma* are divided into eight species-groups; with four species in the *mandibularis*-group, 11 in the *emarginata*-group, 12 in the *weberi*-group, two each in the *marginata*-, *oxysma*-, and *tacta*-groups, and one each in the *transversa*- and *terroni*-groups.

The *mandibularis*-group (Figs 1, 2) and *emarginata*-group (Figs 3–6, 8–13) are very closely related, the former apparently being directly derived from the latter by reduction of the antennal segmentation from 6 to 4 and by shortening of the antennal scapes. Most of the characters of these two groups (see diagnoses) are also shared by the *transversa*-group but in this last-named group the basal lamella of the mandible is different in shape and more extensive than in either of the foregoing groups. In *transversa* the basal lamella of the mandible is a broadly rounded lobe which is visible even when the mandibles are completely closed, whereas in both the *mandibularis*- and *emarginata*-groups the lamella is a truncated high triangle or high rectangle which is concealed by the clypeus when the mandibles are fully closed. Brown (1953a: 125) included *transversa* in the *emarginata*-group but I consider that the difference in structure of the basal lamella of the mandible is sufficient to exclude it. Reinforcing this decision is the presence of a broad infradental lamella on the propodeum in *transversa*, a character not developed in the *emarginata*-group (but present in the *mandibularis*-group).

On a broader basis the *emarginata*-group may be cognate with the Holarctic *rostrata*-group of Brown (1953a: 81), or with part of it. Until a fuller investigation of the *rostrata*-group species from the U.S.A., China and Japan can be made it seems most advisable to keep the groups separate, especially as *rostrata* (Emery) itself has a long stout simple hair at each of the pronotal humeri, a character not encountered in any species of the *emarginata*-group as defined in this paper.

The *terroni*-group, with its single species (Fig. 7), has been derived directly from the

emarginata-group by modification of the mandibular structure. In *terroni* the mandibular blades have narrowed and lengthened, opening a long diastema between the basal lamella and the basalmost tooth, and the number of teeth present has been increased from 12 to 16–17. Apart from these developments the remaining diagnostic characters conform with those of the *emarginata*-group.

The *weberi*-group constitutes a peculiarly Afrotropical assemblage of striking species which are immediately recognized by their very coarse heavy sculpture and fine dense simple pilosity (Figs 14–16). In mandibular structure they resemble the members of the *emarginata*-group, having a high truncated basal lamella followed by a row of five principal teeth, two slightly smaller teeth, four minute denticles and a small apical tooth. However, here the similarity ends and the members of the *weberi*-group are not obviously closely related to any other group, either in Africa or elsewhere.

The *oxysma*-group (Figs 18, 19), containing two species, has a characteristic clypeal form and pilosity. The sides of the clypeus are convergent anteriorly and the anterior margin is prominent and narrowly rounded so that the outer margins of the mandibles and the clypeus form a more or less continuous line in full-face view. The clypeal dorsum is equipped with feebly clavate hairs which characteristically curve posteriorly or posteromedially. This form of clypeus approximates closely to the Nearctic/Neotropical *ornata*-group (Brown, 1953a: 64), but in the three known species of this group (*ornata* (Mayr), *dietrichi* (M. R. Smith), *hyphata* Brown) the mandibles have a long diastema between the basal lamella and the first tooth of the principal row. In the Afrotropical species *oxysma* and *anarta* no such diastema is developed.

The *marginata*-group contains only the two species *marginata* and *rusta* (Fig. 17). The first of these was included as a member of the now synonymized genus *Miccostruma* because of its 4-merous antennae and relatively short mandibles. It is now apparent that the reduction of antennal segmentation from 6 to 4 has occurred independently three times among Afrotropical *Smithistruma* (in the *tacta*-group, the *mandibularis*-group, and in *marginata*), in species that are otherwise broadly dissimilar, and as a result its value as a genus-level character has disappeared (see the discussion of the genus, above). The shape of the clypeus in *marginata* is characteristic and is not matched by members of the *mandibularis*- or the *tacta*-group. Only one other species, *rusta*, has a clypeus shaped like that of *marginata* and so I have grouped them together here. In both species the lateral margins of the clypeus are more or less straight and parallel and the anterior margin is broadly and shallowly convex; the clypeus is devoid of hairs both dorsally and on its margins. For further characters in which the two species coincide, and those in which they differ, see the diagnosis of the *marginata*-group.

Finally the *tacta*-group (Fig. 20), another group having only 4 antennal segments, must be considered. In clypeal form, structure of the mandibular teeth, presence of long flagellate hairs on the pronotal humeri, lack of projecting hairs on the leading edges of the scapes, presence of a median pronotal carina and presence of propodeal infradental lamellae, *tacta*-group members resemble the *oxysma*-group. However, the reduced antennal segmentation and presence of dense simple clypeal pilosity without specialized hairs argue against its inclusion with *oxysma* and for the present it is left on its own.

Key to species-groups (workers)

- 1 Leading edges of antennal scapes without a series of freely anteriorly projecting strong erect to suberect hairs (Figs 17–20). Pronotal humeri with a long flagellate hair on each side. Pronotal dorsum with a median longitudinal ridge or carina at least anteriorly 2
- Leading edges of antennal scapes with a series of freely anteriorly projecting strong erect to suberect hairs which may be simple or bizarre (Figs 1–12, 14, 15). Pronotal humeri without flagellate hairs. Pronotal dorsum without a median longitudinal ridge or carina 4
- 2 Clypeus without hairs; in full-face view the clypeal margins lacking fringing pilosity, in profile the clypeal dorsum without hairs. Anterior clypeal margin broadly and shallowly convex in full-face view, the sides more or less parallel and not converging anteriorly (Fig. 17)

marginata-group (p. 311)
- Clypeus with hairs; in full-face view the clypeal margins with fringing pilosity or at least with a

- few hairs projecting; in profile the clypeal dorsum with hairs present. Anterior clypeal margin narrowly rounded in full-face view, the sides more or less evenly convergent anteriorly (Figs 18–20)..... 3
- 3 Antennae with 6 segments. Clypeus with specialized long recurved hairs present (Figs 18, 19) *oxysma*-group (p. 314)
- Antennae with 4 segments. Clypeus without specialized long recurved hairs (Fig. 20) *tacta*-group (p. 316)
- 4 Pronotal dorsum extremely coarsely sculptured with rugae or sulci. With the clypeus in full-face view the fringing pilosity not consisting of a regular row of curved broad spatulate to spoon-shaped hairs but rather of irregular long cylindrical simple hairs which may or may not be curved (Figs 14, 15)..... *weberi*-group (p. 300)
- Pronotal dorsum finely sculptured to smooth, never with coarse rugae or sulci. With the clypeus in full-face view the fringing pilosity consisting of a regular row of curved broad spatulate to spoon-shaped hairs (Figs 1–12)..... 5
- 5 Mandibles with a long diastema between the basal lamella and the basalmost tooth, the diastema much longer than the height of the basalmost tooth. 16–17 teeth present, the seventh or eighth tooth from the base by far the largest (Fig. 7) *terrioni*-group (p. 298)
- Mandibles without a diastema or at most with a minute diastema between the basal lamella and the basalmost tooth; when present the length of the diastema distinctly much shorter than the height of the basalmost tooth. 12 teeth present, one of the basal series of 5 the largest (Figs 1–6, 8–12) 6
- 6 Basal lamella of mandible an evenly rounded broad lobe which is visible even when the mandibles are fully closed. Anterior clypeal margin transverse *transversa*-group (p. 297)
- Basal lamella of mandible either a high triangle which may be truncated apically, or a high rectangle which may have concave sides; the lamella concealed by the clypeus when the mandibles are closed. Anterior clypeal margin usually concave, only rarely transverse 7
- 7 Antennae with 4 segments. Scapes relatively short, SI 50–57. Propodeum with a conspicuous infradental lamella *mandibularis*-group (p. 281)
- Antennae with 6 segments. Scapes longer, SI 58–80. Propodeum without or with only a slender infradental lamella *emarginata*-group (p. 285)

The *mandibularis*-group

(Figs 1, 2)

Antennae with 4 segments. Basal lamella of mandible a high narrow triangle, usually truncated apically; tooth row of mandible without or with a minute diastema, the principal tooth row of 5. Sculpture of head and body fine, without coarse rugae or sulci on the pronotum. Anterior clypeal margin always concave in full-face view. Lateral and anterior margins of clypeus fringed by a continuous row of projecting flattened or spoon-shaped large hairs which are smaller on the anterior than on the lateral margins. These hairs are curved anteriorly on the sides of the clypeus, medially on the anterolateral angles, and are directed anteriorly or are curved slightly towards the midline on the anterior margin. Body hairs very sparse to absent. Flagellate hairs absent. Leading edges of scapes with strong anteriorly projecting hairs. Dorsal (outer) surfaces of middle and hind tibiae without projecting hairs. Pronotum not marginate laterally and without a median longitudinal ridge or carina on the dorsum. Propodeal spines or teeth subtended by a broad infradental lamella. Postpetiole in dorsal view with spongiform appendages restricted to a posterior transverse strip which is broadest at the posterolateral angles; the disc not completely surrounded by spongiform tissue.

The four closely related species presently recognized in this group appear to be descended directly from the *emarginata*-group and share most characters with that group. They differ primarily by their reduced antennal segmentation, short antennal scapes, development of a broad infradental lamella on the propodeum and by their drastic reduction of body pilosity, although this last character is paralleled by the *chyatha*-complex of the *emarginata*-group. For the separation of the *mandibularis*-group from the remaining species-groups of Africa see the key to groups above and the diagnoses of the individual groups.

As discussed under the diagnosis of the genus the two previously described members of this group (*mandibularis* and *tigrilla*) constituted two-thirds of the now abandoned genus *Miccostruma*. For the third species formerly placed in *Miccostruma* see under the *marginata*-group, below.

Three of the four species in the group occur in West and Central Africa where they constitute a part of the leaf litter and topsoil fauna. *S. tigrilla*, with its distinctive black and yellow transverse bands and continuous row of basigastral costulae, is known from Ivory Coast and Cameroun, and most probably also occurs in the territories between these countries. The other two species occurring in the same area as *tigrilla*, *ninda* and *fulda* are uniformly coloured and have the basigastral costulae originating on each side of a central gap or clear area. *S. fulda* has only been recorded from Ivory Coast, but *ninda* is much more widely distributed, material having been seen from Ivory Coast, Ghana, Nigeria, Chad and Cameroun. The only representative of the *mandibularis*-group known from East and southern Africa is *mandibularis* itself, recorded to the present from Kenya, Tanzania and Angola. Like *fulda* and *ninda* it has basigastral costulae which radiate from each side of a central gap, but unlike them it possesses a pair of standing hairs on the cephalic dorsum close to the occipital margin. A fifth, as yet undescribed, species belonging to this group occurs in the Malagasy region.

***Smithistruma fulda* sp. n.**

(Fig. 1)

HOLOTYPE WORKER. TL 2.0, HL 0.53, HW 0.42, CI 79, ML 0.04, MI 8, SL 0.24, SI 57, PW 0.26, AL 0.54.

Basal lamella of mandible concealed by clypeus, dentition as described for *mandibularis*. Anterior clypeal margin very deeply concave medially, the inner margin of the concavity with 5 pairs of scale-like (inner 3 pairs) to spoon-shaped (outer 2 pairs) hairs which project inward over the mandibles. Anterolateral clypeal angles broadly convex on each side of the median impression, equipped with a series of medially curved spatulate to spoon-shaped hairs which continue along the lateral clypeal margins to about the midlength of the sides of the clypeus. Dorsum of clypeus with the area behind the marginal concavity transversely quite deeply depressed, this concave area occupying about the central third of the dorsum and just over half its total length, from the anterior margin to about the level of the frontal lobes. Areas of the clypeus on each side of this central concave area are convex, as is the posterior portion of the clypeus between the frontal lobes. Dorsum of clypeus densely clothed with small flattened to scale-like hairs which are closely applied to the surface and are directed towards the clypeal midline except on that portion of the clypeus between the frontal lobes where they are directed anteriorly. Cephalic dorsum with numerous short spatulate to scale-like hairs which are larger than those on the clypeus and are all closely applied and directed forward. Dorsum of head without projecting hairs of any description. Antennae with 4 segments. The scape narrow at the extreme base but then suddenly and very powerfully expanded, flattened and extremely broad, the leading edge passing through a strongly anteriorly projecting right-angle and equipped with a series of strong projecting hairs, the longest of which is situated at the apex of the projection. Eyes small, maximum diameter about $0.10 \times HW$, markedly smaller than the maximum diameter of the scape. Dorsum of head reticulate-punctate, the clypeal dorsum finely granular but the sculpture partially concealed by the pilosity. Pronotum not marginate laterally, the dorsum without a median longitudinal ridge or carina but the anterior pronotal border weakly marginate. In profile the dorsal alitrunk consisting of three separate very shallow convexities, the mesonotal slightly higher than the pronotal or propodeal, but the propodeal anteriorly the most strongly convex. Metanotal groove absent but the dorsum with a very slight indentation where the mesonotal convexity meets the propodeal. Propodeal spines not elevated but upcurved along their length, the basal halves of their ventral margins confluent with the broad infradental lamellae. Alitrunk in dorsal view with the metanotal groove represented by a transverse line and change in sculpture. Dorsal surfaces of alitrunk and petiole without standing hairs of any description but the postpetiole with a single pair of simple hairs which are directed posteriorly. First gastral tergite near base with a pair of very stout appressed hairs which are weakly clavate apically. It is possible that these hairs should be erect but have been flattened down as an accident of preservation. Gastral segments behind the first with sparse hairs. Dorsal alitrunk with scattered minute appressed spatulate hairs. Dorsal surfaces of petiole, postpetiole and first gastral tergite with similar or even smaller appressed pubescence. Pronotal dorsum finely longitudinally costulate to rugulose. Mesonotum finely rugulose anteriorly and punctulate posteriorly, the two forms of sculpture blending together centrally. Propodeal dorsum unsculptured except for some fine punctures laterally; declivity unsculptured. Dorsum of petiole node with the faintest vestiges of punctulate sculpture, the postpetiole unsculptured. First gastral tergite unsculptured except for the basal costulae which radiate from the anterolateral margin on each side of a median area which is clear. Spongiform appendages of pedicel segments well developed in profile. In dorsal view the petiole node bordered posteriorly by a broad transverse spongiform strip, the concave anterior face of the postpetiolar disc bordered by a vestigial lamina. Ventrolateral spongiform

tissue of postpetiole does not project beyond the lateral margins of the disc in dorsal view. Convex posterior margin of postpetiole with an appendage which is broad and spongiform posterolaterally but narrowed and laminar medially where the posterior margin of the disc itself is flattened. Base of first gastral tergite with a lamellar transverse margin which is smooth medially but traversed by the strong basigastral costulae on each side. Colour dark brown to blackish brown, the clypeus and appendages lighter.

Holotype worker, **Ivory Coast**: Issoneu, 12.x.1980 (V. Mahnert & J.-L. Perret) (MHN).

In the *mandibularis*-group *fulda* is immediately recognized by the massive angular extension of the antennal scape, the form and pilosity of the clypeus and the costulate-rugulose pronotal sculpture. Beside this *fulda* lacks the conspicuous yellow and black bands of *tigrilla* and does not have the pair of erect hairs on the vertex characteristic of *mandibularis*.

***Smithistruma mandibularis* (Szabo) comb. n.**

Epitritus mandibularis Szabo, 1909: 1, fig. 2. Syntype workers, TANZANIA: Mto-ya-kifaru (K. Katona) (TM) [examined].

Miccostruma mandibularis (Szabo) Brown, 1948: 123.

WORKER. TL 1.7–1.8, HL 0.46–0.52, HW 0.35–0.41, CI 75–80, ML 0.04–0.06, MI 8–11, SL 0.18–0.21, SI 50–57, PW 0.20–0.23, AL 0.44–0.48 (10 measured).

Mandibles armed with a high narrow-based triangular basal lamella which is truncated apically and concealed by the clypeus when the mandibles are closed. Basal lamella without or with only a minute diastema between itself and the principal row of five relatively large teeth, the lamella slightly longer than the largest of these teeth. Distally the principal tooth row followed by two slightly smaller teeth, a series of four minute denticles and a small apical tooth. Anterior clypeal margin concave, the concavity here shallower than in other members of the group, the margin equipped with 3–4 pairs of scale-like hairs which project over the mandibles. Lateral margins of clypeus convergent anteriorly and equipped with a freely projecting fringe of large anteriorly curved spatulate to spoon-shaped hairs. Dorsum of clypeus and cephalic dorsum in full-face view with scattered minute appressed flattened hairs which are directed anteriorly. In profile the dorsal surface with a single pair of erect feebly clavate hairs which are weakly curved forward and are situated just behind the highest point of the vertex. Antennae with 4 segments. Scape narrow basally, bent at about the basal quarter and the anterior border expanded at about this level. Leading edges of scapes flattened and rounded, expanded but not projecting as a strong lobate or angular prominence, equipped with a projecting row of spatulate to spoon-shaped strong hairs. Maximum diameter of eye $0.11 \times HW$. Dorsum of head finely and densely reticulate-punctate to punctate-granular, the sculpture weaker or effaced on the clypeus. Anterior border of pronotum weakly marginate. Sides of pronotum not marginate, the dorsum without a median longitudinal ridge or carina. With the alitrunk in profile the metanotal groove faintly marked, the propodeal teeth with a broad and very conspicuous infradental lamella. All dorsal surfaces of body with scattered minute appressed pubescence. Alitrunk without standing hairs but a pair present on the posterior margin of the petiole node, a second pair on the posterior margin of the postpetiole, a third pair on the base of the first gastral tergite and a fourth pair at the apex of that sclerite. Remaining gastral tergites with sparse erect hairs. Dorsum of pronotum and mesonotum with very faint superficial granular or punctulate sculpture, the propodeal dorsum smooth or with vestigial punctures. Petiole node dorsally with vestigial punctures but disc of postpetiole smooth. First gastral tergite unsculptured except for the basigastral costulae which arise on each side of a median clear area. Spongiform appendages of pedicel segments well developed in profile. In dorsal view the petiole node with a posterior transverse spongiform strip. Anterior margin of postpetiole with a vestigial strip which is less than half the width of that on the petiole. Posterior margin of postpetiole with a transverse strip which is broadest laterally, narrowed medially. Base of first gastral tergite with a lamellar strip which is narrowest medially where its anterior margin is concave, and broadest laterally where its anterior free margin is convex and traversed by the basigastral costulae. Colour yellow to light brownish yellow.

To the present this is the only species of the group to be found in eastern and southern Africa. The other three species are more or less restricted to the rain forest zones of West and Central Africa.

MATERIAL EXAMINED

Kenya: Tana R., Wema (V. Mahnert & J.-L. Perret); Kilife dist., Jilore (V. Mahnert & J.-L. Perret); Lamu, nr Witu (V. Mahnert & J.-L. Perret); Kisumu, Chemelil (V. Mahnert). **Angola**: Salazar (P. Hammond). **Tanzania**: Mto-ya-kifaru (K. Katona).

Smithistruma ninda sp. n.

(Fig. 2)

HOLOTYPE WORKER. TL 1.8, HL 0.52, HW 0.38, CI 73, ML 0.04, MI 8, SL 0.20, SI 53, PW 0.24, AL 0.48.

Anterior clypeal margin deeply concave medially, the concavity fringed with 4 pairs of scale-like hairs which project over the mandibles. Sides of clypeus distinctly convergent anteriorly, fringed by a continuous row of spatulate to spoon-shaped hairs which are curved anteriorly. Mandibles closed in holotype but from a paratype the dentition consisting of a high narrowly triangular basal lamella which is blunted apically and distinctly longer than the largest tooth. A minute diastema separates the basal lamella from the principal row of 5 relatively stout teeth, and these are followed distally by two slightly smaller teeth, 4 minute denticles and a small apical tooth. Dorsum of clypeus and cephalic dorsum without standing hairs of any description, with widely scattered and somewhat flattened minute appressed hairs which are directed anteriorly. Antennae with 4 segments. Scape narrow at base, bent and suddenly broadened in its basal quarter; the leading edge broadly convex at the bend and equipped with a row of freely projecting spatulate to spoon-shaped hairs, but the margin not projecting forward into a broad free lobe or strong angle. Maximum diameter of eye $0.13 \times \text{HW}$. Dorsum of head finely and densely reticulate-punctate, the sculpture becoming finer and more granular anteriorly. Clypeal dorsum granular to merely shagreened. Pronotum without a median longitudinal ridge or carina dorsally, not marginate laterally, the dorsum shallowly transversely convex and rounding broadly and evenly into the sides. With the alitrunk in profile the mesonotum forming a shallow convexity separate from that of the pronotum and propodeum, the metanotal groove extremely faintly indicated on the dorsum, not impressed in profile. Propodeal teeth short and triangular, the anterior half or slightly more of the ventral margin confluent with the broad infradental lamellae. Dorsal surfaces of alitrunk, petiole and first gastral tergite only with very sparse minute appressed pubescence, without standing hairs of any description. Posterior border of postpetiole with a single pair of feebly clavate standing hairs and similar hairs are present on the gastral tergites behind the first. Sides of alitrunk smooth, with a few feeble marginal punctures. Dorsal alitrunk smooth except for a narrow band of punctures just behind the anterior pronotal margin. The alitrunk frequently with a dull slightly rough appearance due to a superficial waxy deposit which when removed leaves the surface smooth and highly polished. Petiole and postpetiole unsculptured dorsally, the first gastral tergite unsculptured except for the basigastral costulae which arise on each side of a central clear area. Spongiform appendages of pedicel segments moderately developed in profile. In dorsal view the petiole node with a distinct spongiform strip posteriorly. Anterior margin of postpetiole with a strip which is about half the width of that on the petiole. Posterior margin of postpetiole with a spongiform strip which is broadest laterally and narrowed centrally. Base of first gastral tergite with a laminar strip which is broadest laterally where it is traversed by the basigastral costulae. Colour dark brown.

PARATYPE WORKERS. TL 1.7–1.8, HL 0.48–0.52, HW 0.37–0.38, CI 73–79, ML 0.03–0.05, MI 7–10, SL 0.18–0.20, SI 50–54, PW 0.22–0.24, AL 0.47–0.50 (9 measured).

As holotype, the maximum diameter of the eye $0.12\text{--}0.14 \times \text{HW}$.

Holotype worker, **Cameroun**: Nkoemvon, 28.ix.1980, no. N 33 (*D. Jackson*) (BMNH).

Paratypes. 6 workers with same data as holotype; 3 workers with same data but 6.x.1980, no. N 34; 1 worker with same data but 1.viii.1980, no. N 18 (BMNH; MCZ; MHN; ENSA).

Non-paratypic material examined. **Ivory Coast**: Gregbeu (*V. Mahnert & J.-L. Perret*); Monogaga (*V. Mahnert & J.-L. Perret*). **Ghana**: Tafo (*D. Leston*); Mampong (*P. M. Room*). **Nigeria**: Gambari (*B. Taylor*); Ibadan (*B. R. Critchley*); Ibadan (*A. Russell-Smith*). **Chad**: Umg. Maundou (*H. Franz*).

The non-paratypic material from Ivory Coast has the alitrunk light brown and the gaster much darker brown, and has a single pair of stout erect hairs close to the base of the first gastral tergite. Such hairs are absent in the type-series but are frequently seen in Ghanaian and Nigerian specimens. The colour of the Ghana material is intermediate between that of the holotype and the higher Ivory Coast samples.

Smithistruma tigrilla (Brown) comb. n.

Miccostruma tigrilla Brown, 1973a: 32, figs 1, 2. Holotype worker, IVORY COAST: nr Divo, 18.iii.1963, berlesate from rain forest leaf litter (*L. Brader*); and paratype worker, Banco Forest Res., nr Abidjan, circuit 1, i.1963, berlesate from rain forest leaf litter (*W. L. Brown*) (MCZ; BMNH) [examined].

WORKER. TL 2.0–2.2, HL 0.56–0.62, HW 0.48–0.51, CI 82–88, ML 0.05–0.06, MI 9–11, SL 0.23–0.26, SI 48–52, PW 0.30–0.32, AL 0.55–0.62 (4 measured).

Dentition of mandibles apparently as described under *mandibularis*. Anterior clypeal margin very broadly and deeply arched-concave, the excavation semicircular in full-face view and the concave margin with 5 pairs of projecting scale-like to spatulate small hairs which are curved medially. Sides of clypeus weakly convergent anteriorly, equipped with a fringe of freely projecting large spatulate to spoon-shaped hairs which are curved anteriorly. Because of the width and depth of the clypeal concavity the anterolateral angles seem narrow and strongly prominent anteriorly. Dorsum of clypeus and cephalic dorsum with widely scattered decumbent to appressed anteriorly directed minute flattened hairs which are very inconspicuous; without standing hairs of any description. Antennae with 4 segments. Scape narrow basally but then the leading edge suddenly broadened into a large anteriorly prominent rounded lobe. Leading edges of scape with a row of large freely projecting spatulate to spoon-shaped hairs. Maximum diameter of eye $0.14\text{--}16\times\text{HW}$. Cephalic dorsum densely and quite sharply reticulate-punctate, the posterior clypeus similarly but more finely sculptured, the sculpture tending to fade out towards the anterior clypeal margin. Pronotal dorsum more or less flat transversely, the dorsum meeting the sides in a bluntly rounded angle. Pronotum without a median longitudinal ridge or carina. With alitrunk in profile the mesonotum forming a shallow convexity which is separate from the pronotum and propodeum. Metanotal groove extremely feebly marked by an impression, its location more obviously indicated by a change of colour. Propodeal teeth without any portion which is free of the infradental lamella. Dorsal surfaces of alitrunk, petiole, postpetiole and first gastral tergite without standing hairs of any description, only with minute appressed slightly flattened pubescence which is very sparse. Gastral tergites behind the first with weakly clavate hairs. Sides of alitrunk mostly smooth, with marginal punctation. Dorsal surfaces of alitrunk, petiole and postpetiole finely and densely reticulate-punctate to granular, the postpetiole also with fine longitudinal costulae or rugulae at least on the anterior half of the disc. Spongiform appendages of pedicel segments only moderately developed in profile, the ventral appendage of the petiole represented only by a small posteroventral lobe below the node. In dorsal view the petiole node with a narrow posterior strip and the postpetiole with an anterior strip of about the same width or even narrower. Posterior margin of postpetiole with a spongiform strip which is broadest laterally and very narrow or even interrupted medially. Posteromedian area of postpetiole disc impressed. Base of first gastral tergite with a narrow spongiform strip which is concave anteromedially. Basigastral costulae arising right across the base of the first tergite, without a broad central gap. Mandibles, clypeus and antennae yellow; remainder of head black. Pronotum, mesonotum and forelegs yellow; propodeum, pleurae, middle and hind coxae black. Middle and hind femora dusky at least basally, remainder of legs yellow. Petiole and postpetiole black. Basal third of first gastral tergite yellow or yellowish white, the rest of the gaster black.

Rendered very distinctive by its conspicuous black and yellow colour pattern, *tigrilla* is also characterized by its lack of dorsal pilosity, rugulose-costulate postpetiolar dorsum, basigastral costulae which arise in a continuous row without a central clear area, and evenly sculptured dorsal alitrunk.

MATERIAL EXAMINED

Ivory Coast: nr Divo (*L. Brader*). **Cameroun:** Korup Res. (*D. Jackson*).

The *emarginata*-group

(Figs 3–6, 8–13)

Antennae with 6 segments. Basal lamella of mandible a high triangle which is narrowly truncated apically, or a concave-sided high rectangle; never a low rounded lobe; never with a marked diastema. Principal dental row of mandible with 5 teeth. Sculpture of head and body fine, without coarse rugae or sulci on the pronotum. Anterior clypeal margin usually concave in full-face view, rarely transverse and never convex. Lateral and anterior margins of the clypeus fringed by a continuous row of large projecting specialized hairs which are usually flattened, spatulate or spoon-shaped and which are very conspicuous, curving anteriorly on the sides, medially on the anterolateral angles and towards the midline on the anterior clypeal margin. Pilosity of head behind clypeus very variable but never consisting solely of fine simple hairs. Frequently very few hairs are present and sometimes none. Flagellate hairs absent from head and alitrunk. Leading edges of scapes with anteriorly projecting stout or bizarre specialized hairs. Dorsal (outer) margins of middle and hind tibiae lacking projecting hairs, any hairs which do occur here are decumbent to appressed. Pronotum not sharply marginate laterally and without a median longitudinal ridge or carina. Propodeum usually without an infradental lamella but sometimes a very narrow to vestigial lamella present.

Eleven species are currently recognized in this group, falling into three complexes of closely related forms.

The *chyatha*-complex (Figs 3–6), containing *behasya*, *cavinasis*, *chyatha*, *impidora* and *sharra*, is characterized by the presence of exceptionally fine and dense pronotal sculpture which usually appears as minute close-packed longitudinal striolae or rugulae upon a granular surface. Coupled with this the head is usually granular, erect hairs are absent from the dorsal alitrunk, and in most suborbicular or very broadly scale-like hairs are developed on the head. These hairs are best developed in *cavinasis* and *sharra*, in which the whole head is covered with them; they are present in transverse bands in *chyatha* and *behasya*. In *impidora* such hairs are absent but it is not known whether this condition is basal for the *chyatha*-complex as a whole or represents a stage where these specialized hairs have been secondarily lost. However, in *chyatha* and *impidora* the head is strongly dorsoventrally flattened, which is certainly a secondary adaptation, and the sequence *sharra*–*behasya*–*chyatha*–*impidora*, showing increased flattening of the head and gradual disappearance of the specialized hairs, implies that the second alternative is most probably correct.

This complex, all the members of which are restricted to West and Central Africa, appears to be the stock from which the *terrioni*-group is descended. Apart from the modified mandibles of *terrioni* its overall resemblance to the members of the *chyatha*-complex is striking.

The *truncatidens*-complex (Figs 9–13), containing *datissa*, *dendexa*, *gatuda*, *hensekta* and *truncatidens*, is defined by the predominance of punctate sculpture on the head and alitrunk, presence of erect hairs on the dorsal alitrunk and lack of broadly scale-like or suborbicular hairs. The head in profile is depressed anteriorly but strongly thickened at the vertex. Members of this complex approach the *rostrata*-group, as noted in the discussion of the species-groups, and also seem to represent the stock from which both the *mandibularis*-group and the *transversa*-group developed. This complex tends to be more widely distributed than the above, with a preponderance of species in East Africa.

The *emarginata*-complex (Fig. 8), containing only *emarginata* itself, is defined by its abundant spoon-shaped cephalic pilosity and basigastral costulae that radiate from each side of a median broad indentation on the first tergite. The species is perhaps the most successful member of the genus in Africa, being found to the present in Ivory Coast, Ghana, Togo, Burundi, Zimbabwe, Angola and South Africa.

Smithistruma behasya sp. n.

(Fig. 4)

HOLOTYPE WORKER. TL 2.5, HL 0.67, HW 0.42, CI 63, ML 0.11, MI 16, SL 0.28, SI 67, PW 0.27, AL 0.68.

Mandibular dentition as described for *cavinasis*. Anterior clypeal margin very shallowly evenly concave, equipped with a row of broad short flattened hairs which project forward over the mandibles. Anterolateral clypeal angles rounded, the sides feebly divergent posteriorly and with a continuous row of anteriorly curved large spatulate to spoon-shaped hairs. In full-face view the preocular laminae feebly convergent posteriorly. Upper scrobe margins divergent posteriorly and with a row of anteriorly directed scale-like to broadly spoon-shaped hairs which are strongly curved. Occipital margin deeply evenly concave. Clypeal dorsum in full-face view with minute appressed stubble-like ground-pilosity, the individual hairs widely scattered. Cephalic dorsum just behind the level of the frontal lobes with a transverse band of broadly scale-like to suborbicular hairs. Behind this band the head only with stubble-like ground-pilosity like that on the clypeus but the zone between the highest point of the vertex and the occipital margin with a second transverse band of broadly scale-like hairs. Dorsum of head without simple fine hairs, without flagellate hairs. Scape bent in the basal third, somewhat flattened and broadest just distal to the bend, the leading edge equipped with a row of freely projecting spatulate to narrowly spoon-shaped hairs, the longest of which occurs at the bend of the scape. Dorsum of head finely and densely punctate, with a granular appearance; clypeal dorsum similarly but less strongly sculptured. Anterior border of pronotum marginate, the sides not marginate and without a median longitudinal ridge or carina dorsally. Metanotal groove represented by a faint transverse line on the dorsum, not impressed. Outline of dorsal alitrunk in profile with the pronotum and anterior part of the mesonotum sloping upwards to the highest point, which is shallowly convex; the posterior portion of the mesonotum and the propodeum forming a single extremely shallowly concave surface which is weakly sloped posteriorly. Propodeal teeth triangular and acute, the

infradental lamella represented only by a narrow concave crest down each side below the teeth. Sides of alitrunk weakly superficially punctate, densest on the mesopleuron, the metapleuron almost smooth. Pronotal dorsum with extremely fine superficial but quite dense scratch-like longitudinal striation and with a few scattered punctures. Mesonotum anteriorly sculptured as pronotum but posteriorly only weakly punctate. Propodeal dorsum almost smooth, with only the faintest vestiges of sculpture. Dorsal alitrunk without standing hairs, flagellate hairs or any form of specialized pilosity, only with sparse appressed minute ground-pilosity. Spongiform appendages of pedicel segments strongly developed in profile, the subpetiolar process curtain-like and with a deep indentation at about its midlength. Postpetiolar ventral appendage large and lobate. Dorsum of petiole node superficially very shallowly punctate, the posterior spongiform strip lamellate. Postpetiole dorsum smooth, its posterior spongiform strip broadly and shallowly indented medially. Basal spongiform strip of first gastral tergite narrow but dense, not traversed by the basigastral costulae, the latter, however, are sharply defined on the tergite behind the spongiform tissue. Petiole and postpetiole dorsally with appressed short very narrowly spatulate hairs, the posterior margins of each segment with one or two pairs of much larger spatulate hairs which project backwards over the spongiform material. First gastral tergite with fine appressed very sparse ground-pilosity, and with two pairs of longer stout hairs. The first, basally situated pair are erect or nearly so, the second pair, situated close to the apical margin of the tergite, are subdecumbent. Colour light brown.

PARATYPE WORKER. TL 2.5, HL 0.67, HW 0.42, CI 63, ML 0.11, MI 16, SL 0.28, SI 67, PW 0.27, AL 0.68. As holotype.

Holotype worker, **Cameroun**: nr Yaounde, sample 1768 (*G. Terron*) (ENSA).

Paratype. 1 worker with same data as holotype (BMNH).

In the *emarginata*-group four out of the five members of the *chyatha*-complex have broadly scale-like to suborbicular hairs on the head. In *cavinasis* and *sharra* such hairs are evenly distributed over the surface (Fig. 3). In *chyatha* the hairs are restricted to a single transverse band just in front of the occipital margin (Fig. 5), but in *behasyla* they are arranged in two transverse bands, one close to the occiput as in *chyatha* and another situated just behind the level of the frontal lobes (Fig. 4).

Smithistruma cavinasis Brown

Smithistruma (*Smithistruma*) *cavinasis* Brown, 1950b: 42. Holotype worker, ZAIRE: Ituri Forest between Beni and Irumu, ii. 1948, no. 2129 (*N. A. Weber*) (AMNH) [examined]. [See also Brown, 1953a: 129.]

WORKER. TL 1.9–2.1, HO 0.52–0.56, HW 0.34–0.37, CI 63–67, ML 0.04–0.06, MI 7–10, SL 0.22–0.26, SI 63–70, PW 0.23–0.25, AL 0.50–0.56 (10 measured).

Mandibular dentition of 5 large teeth following the basal lamella without a diastema, then two slightly smaller teeth and a series of 4 small denticles before the apical tooth. Anterior clypeal margin broadly deeply and evenly concave, the concavity including the whole of the anterior margin except for the anterolateral corners. Lateral margins of clypeus convergent anteriorly and fringed with a continuous row of large flattened spatulate to roughly spoon-shaped projecting hairs which are curved anteriorly. Anterior clypeal margin with a row of 6 broadly scale-like to suborbicular hairs which project out over the mandibles. Dorsum of clypeus and of head with numerous broadly scale-like to suborbicular hairs, densest on the clypeus; such hairs also fringing the lateral borders of the head in full-face view. Flagellate hairs or other pilosity absent. Preocular laminae broad in full-face view and somewhat divergent anteriorly. Antennal scapes narrow basally, bent at about the basal quarter and suddenly broadened, broadest at about this level and the leading edge bluntly subangulate. Dorsal surface of scape with scale-like hairs but leading edge with a series of freely projecting longer narrower hairs, the longest of which occurs at the angle. Eyes of moderate size, 0.11–0.14×HW, the diameter less than the maximum width of the scape. Dorsum of head finely and densely reticulate-punctate, with a granular appearance. Dorsal alitrunk with scattered but conspicuous scale-like to suborbicular hairs, smaller versions of which also occur on the petiole dorsum but which are sparse or absent from the postpetiolar disc and absent from the gaster. Elongate simple hairs absent from alitrunk but present on the petiole (1 pair), postpetiole (2–3 pairs) and base of the first gastral tergite (usually 1–2 pairs but sometimes 3 pairs). Flagellate hairs absent. Alitrunk not marginate laterally, the pronotum without a median longitudinal ridge or carina dorsally. With the alitrunk in profile the mesonotum very slightly raised above the level of the pronotum and propodeum. Metanotal groove not impressed but its site marked by a small step-down from the mesonotal to the propodeal dorsum. Propodeal teeth strong and broad basally, the infradental lamellae very narrow and with a distinctly concave outline. Mesopleuron reticulate-punctate, the remainder of the sides of the

alitrunk unsculptured or only with faint superficial sculpture. Pronotal dorsum finely superficially longitudinally striolate to feebly rugulose, the remainder of the dorsum and the petiole dorsum punctulate. Disc of postpetiole smooth and first gastral tergite unsculptured except for the basigastral costulae. Spongiform appendages massively developed in profile. In dorsal view the sides and posterior margin of the petiole node surrounded by continuous thick spongiform material. The postpetiole with an anterior spongiform transverse strip and with the lateral spongiform material projecting beyond the sides of the disc in dorsal view. Posterior margin of postpetiole disc with a continuous broad spongiform strip which is slightly narrower centrally than at the sides. Base of first gastral tergite with a transverse spongiform band as wide as that on the posterior margin of the postpetiole, and like the postpetiolar strip this is also broadest at the sides and narrow centrally. Colour medium to light brown.

One of only two species in the *emarginata*-group to show broadly scale-like to suborbicular hairs all over the head, *cavinasis* shares this character with *sharra*. Workers of the two species are separated as follows.

cavinasis
Head absolutely and relatively shorter, HL 0.52–0.56, CI 63–67.
Antennal scapes absolutely and relatively shorter, SL 0.22–0.26, SI 63–70.

Posterior margin of postpetiole disc without a row of spatulate to squamate hairs on each side of the midline.

Simple elongate hairs present on the postpetiolar disc.

Simple elongate hairs present on the basal portion of the first gastral tergite.

sharra
Head absolutely and relatively longer, HL 0.58–0.64, CI 56–63.

Antennal scapes absolutely and relatively longer, SL 0.26–0.28. SI 73–78.

Posterior margin of postpetiolar disc with a row of 5–6 spatulate to squamate hairs on each side of the midline which project backward over the spongiform strip.

Simple elongate hairs absent from the postpetiolar disc.

Simple elongate hairs absent from the basal portion of the first gastral tergite.

MATERIAL EXAMINED

Cameroun: Nkoemvon (*D. Jackson*); nr. Yaounde (*G. Terron*). **Zaire:** Ituri Forest (*N. A. Weber*). **Angola:** Dundo (*L. de Carvalho*).

Smithistruma chyatha sp. n.

(Fig. 5)

HOLOTYPE WORKER. TL 2.1, HL 0.62, HW 0.39, CI 63, ML 0.08, MI 13, SL 0.25, SI 64, PW 0.24, AL 0.59.

Mandibles with 5 relatively large teeth followed by two slightly smaller teeth, 4 denticles and an apical small tooth. Basal lamella concealed by clypeus. Anterior clypeal margin broadly and evenly concave, equipped with a row of 7 scale-like hairs which project forward over the mandibles. Of the seven the three central hairs are the smallest, the next one on each side is slightly larger and the outermost on each side (closest to the anterolateral angle) is much larger, transitional in size and shape to the continuous fringe of spatulate anteriorly curved long hairs which project from the lateral clypeal margins. Upper scrobe margins with a single row of adherent suborbicular hairs. Dorsum of head between highest point of vertex and occipital margin with suborbicular hairs present in a transverse band. Remainder of cephalic dorsum and clypeal dorsum without hairs, equipped only with minute pubescence which is somewhat flattened and is only visible under very high magnification. Flagellate hairs absent. Lateral margins of clypeus shallowly convex and convergent anteriorly, the preocular laminae slightly divergent anteriorly in full-face view. Antennal scapes bent very close to the base, broadest at about the point of maximum curvature, with the leading edge broadly rounded and equipped with a series of projecting flattened hairs, the longest of which is about at the point of maximum scape width. Dorsum of scape just behind the leading edge with a sparse row of suborbicular hairs. Maximum diameter of eye about $0.13 \times \text{HW}$, less than the maximum width of the scape. Head very conspicuously dorsoventrally flattened, in profile the ventral surface not strongly convex posteriorly and the dorsum only shallowly convex at the vertex. Sides of alitrunk not marginate, the pronotum without a median longitudinal ridge or carina dorsally. Metanotal groove absent. Propodeal teeth strong, broad basally and upcurved at the tips. Dorsal alitrunk without flagellate or simple hairs of any description, only with very widely scattered extremely small inconspicuous short flattened hairs,

appearing hairless under low magnification. Petiole node with a few small flattened hairs on the dorsum but fringed posteriorly and down the sides, in dorsal view, by a row of larger spatulate to squamate hairs. Lateral and posterior margins of postpetiole fringed with a similar row of spatulate to squamate hairs which project over the spongiform tissue. Dorsum of postpetiole and first gastral tergite only with minute pubescence, without hairs of any description. Spongiform appendages of pedicel segments massively developed in profile. In dorsal view the petiole node bounded posteriorly by a transverse spongiform strip which continues down the sides of the node posterolaterally, the lateral margins of the node in front of this with a few decumbent spatulate hairs but without spongiform tissue. Disc of postpetiole in dorsal view surrounded by spongiform tissue, with a transverse strip on the shallowly concave anterior margin and a broader spongiform strip on the convex posterior margin which is narrowed centrally. The spongiform material visible at the sides of the postpetiole disc is narrower and lower than the anterior and posterior strips but can be seen projecting beyond the lateral margins throughout their length. Base of first gastral tergite with a transverse spongiform strip which is overlapped by that on the posterior margin of the postpetiole and which is not narrowed centrally. Pronotal dorsum with dense but very fine low superficial longitudinal rugulae. Mesonotum superficially punctulate. Propodeal dorsum mostly smooth, with scattered small punctulae. Mesopleuron finely punctulate, metapleuron smooth but the sides of the propodeum with scattered quite large punctures. Petiole node faintly punctulate dorsally, the postpetiole smooth and shining. First gastral tergite unsculptured except for the short widely spaced basigastral costulae.

Holotype worker, **Ghana**: Tafo, 15.x.1970, cocoa leaf litter (*B. Bolton*) (BMNH).

Along with *impidora* in the *emarginata*-group *chyatha* shares the characters of strongly reduced pilosity and markedly dorsoventrally flattened head, where the maximum depth of the head is $0.60 \times HW$ and the posteroventral convexity of the surface is vestigial. The retention by *chyatha* of some suborbicular hairs on the cephalic dorsum links this species with *behasylla*, *sharra* and *cavinasis*, where these specialized hairs are much better developed. In the worker *chyatha* and *impidora* are easily separated as the former has a row of adherent suborbicular hairs lining the upper scrobe margins and has a transverse band of suborbicular hairs on the cephalic dorsum between the vertex and the occipital margin. Such suborbicular hairs are absent in *impidora*.

***Smithistruma datissa* sp. n.**

(Fig. 9)

HOLOTYPE WORKER. TL 2.7, HL 0.70, HW 0.54, CI 77, ML 0.12, MI 17, SL 0.34, SI 63, PW 0.34, AL 0.74.

Mandibles armed with 5 relatively large teeth following the basal lamella (which is concealed by the clypeus in the holotype). Distal to the 5 principal teeth are 2 slightly smaller teeth, a row of four denticles and a small apical tooth. Anterior clypeal margin broadly and evenly concave between the anterolateral corners, the margin equipped with 10 scale-like hairs which project forward over the mandibles. These hairs become gradually larger away from the midline but the outermost, at the anterolateral corner, is much the largest and forms an intermediate between the shorter hairs on the anterior margin and the large spatulate to spoon-shaped anteriorly curved hairs which form a fringe on the lateral clypeal margins. In full-face view the preocular laminae slightly divergent anteriorly. Clypeal dorsum more or less smooth centrally but feebly sculptured laterally and anteriorly. Cephalic dorsum densely shallowly reticulate-punctate everywhere. Dorsum of head with numerous small, widely spaced flattened hairs which are subdecumbent to decumbent and are mostly directed anteriorly. In full-face view the sides of the head with a few such hairs projecting, curved anteriorly, most conspicuous on the sides of the occipital lobes. Flagellate hairs absent. Antennal scapes narrow basally, shallowly bent at about the basal third and broadest at this point. The leading edges of the scapes evenly curved at the bend and equipped with a row of projecting spatulate to broadly clavate hairs and an interspersed row of shorter much finer simple hairs. Maximum diameter of eye about $0.13 \times HW$, approximately equal to the maximum width of the scape. Head in profile roughly wedge-shaped, the vertex forming a high narrowly rounded convexity, the ventral surface evenly shallowly convex. Pronotal dorsum without a median longitudinal ridge or carina, not sharply marginate laterally. Alitrunk without flagellate hairs. With the alitrunk in profile the posterior part of the pronotum and anteriormost section of the mesonotum raised into a broad shallowly convex tumulus, the remainder of the mesonotum and the propodeum, which form a single surface without trace of a metanotal groove, markedly depressed below the level of this tumulus. Propodeal teeth short and broadly triangular, the infradental lamellae narrow but clearly visible. Dorsal alitrunk with scattered short flattened hairs which are decumbent to appressed, without standing pilosity of any description. Petiole and

postpetiole dorsally with similar but extremely sparse hairs, the latter also with 4 clavate suberect hairs projecting from the posterior margin. In the holotype a single clavate hair is also present on the left side of the postpetiolar disc, appressed to the surface; this is not matched in the paratypes. First gastral tergite with numerous suberect to erect stout hairs which are simple to weakly clavate apically. Pronotal dorsum predominantly broadly reticulate-punctate but anteriorly and laterally the margins of the punctures tending to run together and form very fine rugulae. Mesonotum and propodeal dorsum more sharply punctate, the sculpture on the latter running between the propodeal teeth and ending about half way down the declivity. Petiole dorsum minutely rugulose, the disc of the postpetiole finely longitudinally costulate. Basigastral costulae sharply developed and conspicuous, the tergite otherwise unsculptured. Alitrunk pleurae mostly smooth centrally but punctulate marginally, a line of punctures separating meso- and metapleuron and a relatively densely punctured patch on the mesopleuron behind the upper half of the front coxa. Spongiform appendages of pedicel segments moderately large in profile. In dorsal view the petiole node with a posterior spongiform strip which is continued down the sides. Postpetiole with a narrow spongiform strip anteriorly and a broader strip bordering the posterior margin which is slightly narrowed medially. Colour dark brown.

PARATYPE WORKERS. TL 2.6–2.7, HL 0.70, HW 0.54, CI 77, ML 0.12, MI 17, SL 0.34, SI 63, PW 0.32–0.34, AL 0.73–0.74 (2 measured).

As holotype but maximum diameter of eye 0.13–0.15×HW.

Holotype worker, **Rwanda**: Rangiro, ix.1976 (*P. Werner*) (MHN).

Paratypes. 2 workers with same data as holotype (BMNH; MCZ).

The *truncatidens*-complex of this group contains five species. Four of these, *gatuda*, *hensekta*, *dendexa* and *truncatidens*, possess conspicuously projecting hairs on the sides of the occipital lobes. In *datissa*, however, such projecting hairs are absent, any hairs which occur on the sides of the occipital lobes being small and curved, usually closely adherent to the head and not freely projecting. *S. datissa* is also separated from *gatuda*, *dendexa* and *hensekta* by having the postpetiolar disc longitudinally costulate; it is glassy smooth in the last three named. A few specimens of *truncatidens* do show costulae either on part or all of the postpetiole but here the mesonotum has a pair of long erect hairs which are not seen in *datissa*.

Smithistruma dendexa sp. n.

HOLOTYPE WORKER. TL 2.1, HL 0.58, HW 0.41, CI 71, ML 0.08, MI 14, SL 0.26, SI 63, PW 0.26, AL 0.58.

Mandibles closed but dentition apparently as described for *truncatidens*, certainly with 5 large teeth basally, the fourth of which, counting from the base, is the smallest, about the same size as teeth six and seven. Anterior clypeal margin broadly shallowly concave, with a row of small scale-like hairs which project over the mandibles. Lateral margins of clypeus slightly convergent anteriorly, the preocular laminae slightly convergent posteriorly in full-face view. Lateral margins of clypeus equipped with a row of freely projecting anteriorly curved large spatulate to spoon-shaped hairs. Upper scrobe margins divergent posteriorly, with projecting anteriorly curved spatulate to narrowly spoon-shaped hairs which are not as dense nor as broad as those on the lateral margins of the clypeus, and which mostly also curve upwards from their points of origin. Clypeal dorsum and cephalic dorsum with numerous small flattened hairs which are curved anteriorly and appear scale-like in full-face view. Antennal scape bent at the basal third, broadest at or just distal to the bend. Leading edge of scape with a row of freely projecting long stout hairs. Head without flagellate hairs. Dorsum of head densely punctulate and matt, the clypeal dorsum less strongly sculptured. Pronotum not marginate laterally, without a median longitudinal ridge or carina. Metanotal groove absent. With the alitrunk in profile the anterior half of the mesonotum forming the highest point of the outline as a low tumulus. Posterior half of mesonotum and propodeum forming a single feebly sinuate surface. Propodeal teeth triangular and acute, weakly elevated and with a narrow infradental lamella. Dorsal alitrunk with a number of appressed short fine hairs. Large erect hairs on alitrunk restricted to a single long stout pair which are weakly clavate apically and situated on the raised anterior portion of the mesonotum. Without other standing pilosity on the alitrunk and without flagellate hairs. Dorsal surfaces of petiole, postpetiole and first gastral tergite with numerous suberect to erect stout hairs which are feebly clavate apically. Sides of alitrunk mostly smooth but mesopleuron punctate anteriorly and sides of propodeum punctate. Pronotal dorsum finely longitudinally rugulose, without punctate sculpture; mesonotum and propodeal dorsum densely reticulate-punctate. Dorsum of petiole node punctate, the postpetiolar disc unsculptured. First gastral tergite unsculptured except for the sharply defined basal costulae. Spongiform appendages of pedicel segments strongly developed in profile. In dorsal view the petiole node

with a narrow lamellar spongiform strip posteriorly and a similar but narrower strip on the anterior margin of the postpetiole. Sides of postpetiole without projecting spongiform material in dorsal view but the posterior margin with a transverse strip which is broad posterolaterally but considerably narrowed medially. Base of first gastral tergite with a transverse lamellar strip which is traversed by the basigastral costulae. Colour dull yellow to light yellowish brown.

PARATYPE WORKER. TL 2.1, HL 0.60, HW 0.42, CI 70, ML 0.08, MI 13, SL 0.27, SI 64, PW 0.28, AL 0.58. As holotype.

Holotype worker, **Cameroun**: nr Yaounde, sample 1779 (*G. Terron*) (ENSA).

Paratype. 1 worker with same data as holotype (BMNH).

S. dendexa is very closely related to *truncatidens*, an East African species known from Rwanda, Burundi, Kenya and Tanzania. The two species agree in most diagnostic characters but *dendexa* is smaller (compare measurements) and has fine longitudinal rugulae on the pronotal surface, without punctures. In *truncatidens* the pronotum is usually punctate but at most only a few feeble scattered rugulae occur, due to alignment of the walls of adjacent punctures.

Smithistruma emarginata (Mayr)

(Fig. 8)

Strumigenys emarginata Mayr, 1901: 26. Syntype workers, SOUTH AFRICA: Port Elizabeth (*H. Brauns*) (NMV) [examined].

Smithistruma (*Smithistruma*) *emarginata* (Mayr) Brown, 1948: 105; 1953a: 126.

WORKER. TL 2.4–2.8, HL 0.64–0.70, HW 0.39–0.42, CI 58–64, ML 0.11–0.12, MI 16–19, SL 0.29–0.32, SI 72–80, PW 0.24–0.28, AL 0.62–0.72 (18 measured).

Mandibles with a high truncated triangular basal lamella (concealed by clypeus when mandibles are closed), followed without a diastema by a row of 5 relatively large teeth, 2 slightly smaller teeth and 4 small denticles before the apical tooth. Anterior clypeal margin in full-face view varying from almost transverse to evenly shallowly concave. Lateral margins of clypeus slightly convergent anteriorly, the anterolateral clypeal angles bluntly rounded. Anterior clypeal margin fringed by a series (usually of 6–8) broad scale-like hairs, the lateral margins and corners with an unbroken sequence of long fringing hairs which are flattened to spoon-shaped and which are curved anteriorly on the sides and medially on the anterolateral corners. Dorsum of clypeus and of head behind clypeus with numerous spoon-shaped curved hairs which appear scale-like in full-face view. Sometimes the occipital region with a few simple curved hairs present but these variable in number and degree of development; flagellate hairs never developed. With the head in full-face view the upper scrobe margins and occipital lobes laterally fringed with anteriorly curved spoon-shaped hairs, the head long and narrow (CI < 65) and with the eyes plainly visible, projecting beyond the level of the upper scrobe margins. Eyes larger than in any other known Afrotropical species, their maximum diameter 0.21–0.25 × HW, greater than the maximum width of the scape. Scares long (SI > 70), narrow basally, shallowly curved at about the basal third and broadest just distal to this where the leading edge is bluntly subangulate. Leading edges of scares with projecting flattened to spoon-shaped strong hairs. With the head in profile the dorsum very shallowly impressed between clypeus and vertex, highest at the vertex and sloping down posteriorly to the occipital margin. Dorsum of head finely and densely reticulate-punctulate to granular everywhere. With the alitrunk in profile the central portion of the mesonotum extremely feebly impressed. The metanotal groove not impressed but sometimes represented as a line. Propodeal teeth long and narrow, often slightly upcurved and sometimes weakly sinuate along their length. Infradental lamellae narrow and inconspicuous down the propodeal declivity. Sides of alitrunk not marginate, the pronotal dorsum without a median longitudinal ridge or carina, the pronotal humeri evenly rounded. Pilosity of dorsal alitrunk variable, usually with curved spoon-shaped hairs on pronotum and anterior mesonotum but behind this the hairs longer and finer, subspatulate to cylindrical and simple, and often with one or two pairs suberect to erect. Variation from this more or less median position is shown on the one hand in samples where all the hairs are spoon-shaped and merely vary in size (becoming larger posteriorly), there being no subspatulate or simple hairs developed; and on the other hand by the suppression of the spoon-shaped hairs and their replacement everywhere by simple suberect to erect pilosity. Flagellate hairs never present. Pronotal dorsum very finely and faintly striate, this sculpture sometimes virtually effaced. Mesonotum and usually also propodeal dorsum finely punctulate; sides of alitrunk punctulate. Spongiform appendages of petiole and postpetiole massively developed in profile. In dorsal view the petiole with a spongiform strip on its posterior margin which is strongest posterolaterally.

Anterior margin of postpetiole in dorsal view with a spongiform strip but the sides without. The broadly convex posterior margin of the postpetiole with spongiform tissue very broadly developed at the sides but strongly indented or even interrupted medially, usually the posterior margin of the spongiform material touching the margin of the postpetiolar disc centrally. Petiole dorsum very faintly punctulate to smooth, the disc of the postpetiole always unsculptured and smooth. Dorsal surfaces of petiole, postpetiole and first gastral tergite with elongate simple curved hairs present. First gastral tergite impressed mediobasally, usually sharply so, the impressed area usually including both the central portion of the basal lamellar band of the tergite and the tergal area immediately behind it. Basigastral costulae absent from the impressed area, radiating from each side of it; gaster otherwise unsculptured. Colour yellow to medium brown, sometimes the gaster distinctly darker than the head and alitrunk.

Within its species-group *emarginata* stands very much alone, lacking the pilosity and other characters of the various species-complexes discussed under the species-group diagnosis, but possessing an elongate narrow head, long scapes and a basally indented first gastral tergite coupled with the largest eyes known for a member of this genus in the Afrotropical region.

Despite the wide range of the species it shows relatively little variation, the only notable changes occurring in the form of the alitrunk pilosity as discussed above. Brown (1953a: 126) first drew attention to this but noted that, even though his material was sparse, intergrades between the forms were apparently present. This study has confirmed that alitrunk pilosity is by no means stable in *emarginata* and, like Brown, I am of the opinion that the differences observed only represent variation between populations and are not significant at species-level.

MATERIAL EXAMINED

Ivory Coast: Lamto, Toumodi (*J. Levieux*). **Ghana:** Mampong (*P. Room*). **Togo:** Palimé, Kpime Forest (*Vit*). **Burundi:** Imbo Plain (*A. Dejean*). **Zimbabwe:** Sawmills (*G. Arnold*), Gwebi (*K. J. Wilson*); Chishawasha (*A. Watsham*). **Angola:** Dundo, Luachino (*Machado*). **South Africa:** Cape Prov., Port Elizabeth (*H. Brauns*); Algoa Bay (*H. Brauns*); Grahamstown (*L. Weatherill*); Natal, Zululand, Richard's Bay (*J. C. Faure*); St Lucia Lake, Bird Island (*J. C. Faure*).

Smithistruma gatuda sp. n.

(Fig. 11)

HOLOTYPE WORKER. TL 2.2, HL 0.59, HW 0.42, CI 71, ML 0.06, MI 10, SL 0.28, SI 67, PW 0.27, AL 0.60.

Mandibles with 5 relatively large teeth followed distally by two slightly smaller teeth and a series of 4 denticles before the apical tooth. Basal lamella of mandible concealed by clypeus and not visible. Anterior clypeal margin broadly and shallowly concave between the broadly rounded anterolateral angles, the margin equipped with 6 spatulate to spoon-shaped broad hairs which are strongly curved towards the midline and arranged in three pairs; the innermost pair so strongly curved together that the apices are almost touching, the outermost pair intermediate in size to the very large spoon-shaped hair at the anterolateral clypeal corner. Lateral clypeal margins shallowly convex and very feebly convergent anteriorly, equipped with a fringe of anteriorly curved large spatulate to spoon-shaped hairs. Clypeal and cephalic dorsa with a ground-pilosity of small spoon-shaped curved hairs. Sides of occipital lobes in full-face view with freely projecting long feebly clavate hairs. With head in profile the dorsum from the highest point of the vertex back to the occipital margin with a number of long erect to suberect anteriorly curved hairs which are feebly clavate to weakly remiform. Preocular laminae in full-face view weakly divergent anteriorly but reaching a maximum width before meeting the clypeus, and from there to the clypeus slightly convergent. Antennal scapes narrow basally, bent at about the basal third and broadest at about this point, the leading edge subangulate at the point of maximum width and with a series of freely projecting spatulate hairs. Flagellate hairs absent. Clypeus, area between frontal lobes and a short median strip behind that smooth and unsculptured. Remainder of head densely punctate to reticulate-punctate, the punctures and spaces between them glossy. Head in profile with vertex moderately high and narrowly rounded, the ventral surface behind the level of the eye broadly and evenly convex. Maximum diameter of eye distinctly less than maximum width of scape. Pronotum with lateral margins bluntly narrowly rounded but not marginate, the dorsum without a median longitudinal ridge or carina and the humeri lacking flagellate hairs. Anterior portion of mesonotum raised up to level of pronotal dorsum, the remainder of the mesonotum and the propodeal dorsum markedly depressed. Highest point of raised anterior portion of mesonotum with a pair of long erect stout hairs which constitute the only standing pilosity on the dorsal alitrunk. Metanotal groove absent, the mesonotal and propodeal dorsa forming a single surface. Propodeal

teeth long and narrow, slightly upcurved, the infradental lamellae narrow. Alitrunk dorsum with scattered minute appressed hairs and the long mesonotal pair mentioned above. Petiole with one pair of long straight simple hairs, postpetiole with 3–4 pairs. Gastral tergites with numerous straight hairs which are simple to feebly clavate, erect to suberect. Dorsal alitrunk glassy smooth, highly polished with widely separated small punctures. Petiole and the voluminous postpetiole glassy smooth dorsally, the first gastral tergite unsculptured except for the basigastral costulae. Pleurae of alitrunk smooth except for a patch of evenly spaced punctures occupying the central third or slightly more of the mesopleuron. Extreme base of first gastral sternite with sparse but sharply incised punctures. Spongiform appendages of pedicel segments strongly developed in profile. In dorsal view the posterior margin of the petiole node with a transverse strip which is broad and spongiform postrolaterally but which is very narrow and lamellar centrally. The concave anterior margin of the postpetiole with a narrow translucent lamellar strip, the posterior margin with a transverse strip which is broad laterally but contracted down to a narrow isthmus medially. Transverse basal strip of first gastral tergite lamellar rather than spongiform and traversed by the raised basigastral costulae. Colour light glossy brown.

PARATYPE WORKERS. TL 2.2–2.3, HL 0.58–0.60, HW 0.41–0.42, CI 70–71, ML 0.06, MI 10, SL 0.26–0.28, SI 63–67, PW 0.26–0.28, AL 0.60–0.62 (5 measured). As holotype.

Holotype worker, **Rwanda**: Rangi, 10.vii.1973, 1800m (*P. Werner*) (MHN).

Paratypes. 4 workers with same data as holotype; 1 worker with same data but 6.viii.1973 (MHN; BMNH; MCZ).

A very distinctive species of the *emarginata*-group, *gatuda* is characterized by its distribution of simple pilosity, reduced alitrunk sculpture and glassy smooth body.

Smithistruma hensekta sp. n.

(Fig. 12)

HOLOTYPE WORKER. TL 2.1, HL 0.60, HW 0.41, CI 68, ML 0.10, MI 17, SL 0.24, SI 59, PW 0.25, AL 0.58.

Mandibles with 5 relatively large teeth following the basal lamella (concealed by the clypeus), distal to which are 2 slightly smaller teeth followed by 4 minute denticles and a small apical tooth. Anterior clypeal margin transverse, equipped with 3 pairs of medially curved flattened hairs of which the outermost pair is the largest, forming a transition to the long anteriorly curved spatulate hairs which form a continuous fringe along the lateral clypeal margins. Sides of clypeus feebly convergent anteriorly. With the head in full-face view the sides with numerous straight to slightly curved freely projecting stout hairs which are feebly clavate. Dorsum of clypeus and cephalic dorsum from posterior clypeal margin to highest point of vertex with numerous short scale-like hairs which are curved anteriorly. Scale-like hairs absent from highest point of vertex back to the occipital margin, replaced by numerous distinctly longer erect to suberect hairs which are simple to feebly clavate and mostly slightly curved anteriorly. This broad band of simple hairs occupies the dorsum from the vertex to the occiput and the surfaces of the occipital lobes. Flagellate hairs absent. Antennal scapes curved and broadened at about the basal third, the leading edge of the scape with a freely projecting row of long stout hairs. Maximum diameter of eye $0.15 \times HW$. Cephalic dorsum reticulate-punctate everywhere, with a rough granular appearance. Clypeal dorsum less strongly sculptured than remainder of head. Pronotum not sharply marginate laterally, lacking a median longitudinal ridge or carina dorsally and without flagellate hairs at the humeri. Metanotal groove absent but posterior half of mesonotum very shallowly concave. Propodeal teeth long and narrow, slightly upcurved along their length. Infradental lamellae vestigial. Flagellate hairs absent but pronotal humeri each with a laterally projecting stout hair which is feebly clavate. Dorsal alitrunk with 6 pairs of elongate stout erect hairs which are simple to feebly clavate, and similar hairs are numerous on the petiole, postpetiole and first gastral tergite but tending to be curved posteriorly on the pedicel segments; without other pilosity. Sides of alitrunk densely punctate. Dorsal alitrunk densely punctate, the punctures slightly smaller and more widely spaced on the pronotum than on the mesonotum or propodeum. Dorsum of petiole finely punctate; disc of postpetiole unsculptured and glassy smooth. First gastral tergite unsculptured except for the sharply defined row of basigastral costulae. Spongiform appendages of pedicel segments strongly developed in profile. In dorsal view the petiole node with a spongiform strip along the posterior margin, the spongiform material also extending down the posterolateral surfaces of the node. Anterior postpetiolar margin transverse to exceptionally feebly concave, with a narrow spongiform strip; the posterior margin with a much broader spongiform band which is broadest posterolaterally and narrowed medially. In dorsal view the lateral spongiform tissue of the postpetiole can be seen projecting beyond the outline of the disc. Base

of first gastral tergite with a transverse spongiform band which is overlapped by that on the posterior margin of the postpetiole. Colour uniform dull yellow.

PARATYPE WORKERS. TL 2.0–2.1, HL 0.58–0.60, HW 0.39–0.41, CI 67–68, ML 0.10–0.11, MI 17–18, SL 0.24–0.25, SI 59–63, PW 0.24–0.26, AL 0.58–0.60 (4 measured).

As holotype but in two workers the mandibles are open and the basal lamella is visible as a broad-based high triangle which tapers strongly to a narrow truncated apex; there is no diastema between the basal lamella and the basalmost tooth of the principal row.

Holotype worker, **Ghana**: Mampong, 9.ii.1970 (*P. Room*) (BMNH).

Paratypes. 4 workers with same data as holotype (BMNH; MHN; MCZ).

Non-paratypic material examined. **Ivory Coast**: Divo (*L. Brader*). **Ghana**: Tafo (*D. Leston*); Mampong (*P. Room*). **Cameroun**: nr Yaounde (*G. Terron*). **Gabon**: Plateau d'Ipassa (*J. A. Barra*). **Angola**: Salazar (*P. Hammond*).

The dimensions of the seven specimens constituting the non-paratypic material are HL 0.56–0.60, HW 0.37–0.40, CI 66–69, MI 17–18, SL 0.24–0.25, SI 60–65. Apart from slight variation in intensity of punctate sculpture on the alitrunk the main variation is only that 6–7 pairs of hairs may be present on the dorsal alitrunk and that the outermost pair of hairs on the anterior clypeal margin (at the corners) may be relatively small, so that the anterior margin may have 3–4 medially curved pairs of hairs.

Within the *emarginata*-group *hensekta* is quickly diagnosed by its transverse anterior clypeal margin and characteristic pilosity as described above. It appears closest related to *truncatidens* but the two are separated as follows in the worker.

<i>hensekta</i>	<i>truncatidens</i>
HW 0.37–0.41, CI 66–69.	HW 0.46–0.54, CI 72–76.
Anterior clypeal margin transverse.	Anterior clypeal margin concave.
Dorsum of head from highest point of vertex to occiput with erect to suberect simple to clavate hairs.	Dorsum of head from highest point of vertex to occiput with anteriorly curved flattened hairs which are suberect only close to occipital margin.
Pronotal humeri each with a laterally projecting stout feebly clavate hair.	Pronotal humeri without laterally projecting hairs.
Dorsal alitrunk with 6–7 pairs of stout erect hairs.	Dorsal alitrunk with 1–2 pairs of stout erect hairs.
Base of first gastral tergite with a broad spongiform strip, the basigastral costulae not traversing it, not running up to the basal margin.	Base of first gastral tergite without a broad spongiform strip, the basigastral costulae running up to the basal margin.
Posterior spongiform appendage of postpetiole not interrupted medially.	Posterior spongiform appendage of postpetiole interrupted medially.

Smithistruma impidora sp. n.

(Fig. 6)

HOLOTYPE WORKER. TL 2.1, HL 0.64, HW 0.40, CI 63, ML 0.06, MI 9, SL 0.25, SI 63, PW 0.25, AL 0.58.

Mandibles equipped with 5 relatively large teeth following the basal lamella (which is concealed by the clypeus). Distal to these are two slightly smaller teeth followed by 4 minute denticles and a small apical tooth. Anterior clypeal margin broadly and evenly concave, equipped with a series of 7 scale-like hairs which project forward over the mandibles. Of these the three central hairs are the smallest and the outermost pair, almost at the anterolateral angles, are by far the largest and form a transition to the fringe of large spatulate to spoon-shaped projecting hairs which line the lateral clypeal margins. Dorsum of clypeus and cephalic dorsum devoid of hairs of any description; upper scrobe margins and sides of head posteriorly devoid of hairs of any description. The cephalic dorsum and clypeal dorsum with scattered minute pubescence which is only visible at high magnification. Sides of clypeus shallowly convex and convergent anteriorly in full-face view. Preocular laminae slightly divergent anteriorly in full-face view. Antennal scapes broad and flattened, bent very close to the base and broadest at the level of the bend or just distal to it. Leading edges of scapes evenly rounded at the bend and with a series of projecting large

spatulate hairs. Cephalic dorsum finely punctulate-granular everywhere, the clypeus shagreened. Head in profile very obviously dorsoventrally flattened, the ventrolateral margin of the head almost flat and the mid-posteroventral convexity of the head vestigial. Eyes of moderate size, the maximum diameter about $0.13 \times \text{HW}$, less than the maximum width of the scape. Pronotum not marginate laterally, without a median longitudinal ridge or carina dorsally. With alitrunk in profile the mesonotum and propodeum forming a single almost flat surface, without trace of metanotal groove. Propodeal teeth only slightly elevated from the line of the mesonotal-propodeal dorsa, somewhat upcurved along their length. Infradental lamellae vestigial, merely a minute crest between the propodeal teeth and the metapleural lobes. Dorsal alitrunk and dorsal surfaces of petiole, postpetiole and first gastral tergite lacking standing hairs of any description. The alitrunk and first gastral tergite only with minute appressed pubescence but the petiole and postpetiole bordered posteriorly by a sparse row of indistinct appressed hairs which project backward over the posterior spongiform appendages of the segments. Pronotal dorsum exceedingly feebly sculptured with vestiges of low minute longitudinal rugulae which are almost completely effaced. Mesonotum and propodeal dorsum smooth. Dorsum of petiole node shagreened, postpetiolar disc smooth. First gastral tergite unsculptured except for the feeble and widely spaced basigastral costulae. Sides of alitrunk mostly smooth but with punctures on the mesopleuron and sides of the propodeum. Spongiform appendages of pedicel segments massively developed in profile. In dorsal view the posterior border of the petiole node with a transverse spongiform strip which continues down the sides. Anterior margin of postpetiole shallowly concave and with a transverse spongiform strip, the posterior margin convex at the sides but flattened or slightly indented medially and with a transverse spongiform strip which is narrowed centrally. Sides of postpetiole disc with the more ventrally situated spongiform material projecting beyond the outline and visible in dorsal view; the spongiform tissue outline diverging from front to back. Base of first gastral tergite with a transverse spongiform band which is overlapped by that on the postpetiole. Colour uniform light brown.

PARATYPE WORKERS. TL 2.1–2.2, HL 0.62–0.64, HW 0.39–0.40, CI 63, ML 0.06, MI 9–10, SL 0.25–0.26, SI 64–65, PW 0.24–0.25, AL 0.56–0.60 (2 measured).

As holotype but maximum diameter of eye $0.11\text{--}0.13 \times \text{HW}$.

Holotype worker, **Ivory Coast**: Abidjan, Banco Nat. Park, primary forest, dead trunk, 3.iii.1977 (*I. Löbl*) (MNH).

Paratypes. 2 workers with same data as holotype (BMNH; MCZ).

The flattened head and lack of specialized pilosity isolate *impidora* from the other members of the *emarginata*-group. The closest related species is *chyatha*, but here the dorsum of the head retains a transverse band of suborbicular hairs between the vertex and the occipital margin. In *behasyla*, another close species, two such bands of hairs are present, one occipitally and one just behind the frontal lobes, and the head is by no means as strongly dorsoventrally flattened.

Smithistruma sharra sp. n.

(Fig. 3)

HOLOTYPE WORKER. TL 2.1, HL 0.62, HW 0.38, CI 61, ML 0.06, MI 10, SL 0.28, SI 74, PW 0.24, AL 0.60.

Mandibles with 5 relatively strong teeth following the basal lamella without a diastema. Distal to these main teeth are two slightly smaller teeth, followed by 4 minute denticles and an apical small tooth. Anterior clypeal margin strongly and evenly concave, the concavity involving the entire border between the anterolateral angles. Lateral margins of clypeus feebly convex and convergent anteriorly, fringed with a continuous series of large flattened spatulate to spoon-shaped hairs which project freely and are curved anteriorly. Anterior clypeal margin with a row of 6 broadly scale-like to suborbicular hairs which project out over the mandibles. Dorsum of clypeus and remainder of head densely covered with broadly scale-like to suborbicular hairs which are densest on the clypeus; such hairs also fringe the lateral borders of the head in full-face view. Flagellate hairs or other pilosity absent. Preocular laminae broad in full-face view and somewhat divergent anteriorly. Antennal scapes narrow basally, bent at about the basal quarter and suddenly broadened, broadest at about this level and the leading edge evenly rounded with a narrow prominent lamina. Dorsal surface of scape with scale-like hairs but leading edge with a series of freely projecting longer narrower hairs, the longest of which occurs at about the broadest part of the scape. Eyes of moderate size, about $0.11 \times \text{HW}$, smaller than the maximum width of the scape. Dorsum of clypeus and area immediately posterior to it very finely reticulate-punctate, with a granular appearance. Remainder of dorsum similarly sculptured but also with scattered very short low rugulae. Dorsal alitrunk with scattered but conspicuous scale-like hairs, which are also conspicuous on the petiole and postpetiole, though

averaging smaller in size. In dorsal view the posterior margin of the postpetiolar disc with a row of 5–6 scale-like to spatulate hairs on each side of the midline which project out over the spongiform tissue; the posterior petiolar margin with a similar row of 4 scale-like hairs (2 on each side of the midline). Standing simple hairs absent from alitrunk, petiole, postpetiole and first gastral tergite; flagellate hairs never developed. Alitrunk not marginate laterally, the pronotum flattened and without a median longitudinal ridge or carina dorsally. With the alitrunk in profile the mesonotum very slightly raised above the level of the pronotum and propodeum. Metanotal groove not impressed but its site marked by the small step-down from the mesonotal to the propodeal dorsum. Propodeal teeth strong, broad basally and slightly upcurved along their length, the infradental lamella very narrow and its outline distinctly concave. Pleurae and sides of propodeum densely punctulate. Pronotal dorsum exceedingly feebly rugulose, the rugulae tending to be irregular but with an overall longitudinal trend. Spaces between the minute rugulae shagreened and dull. Remainder of dorsal alitrunk and petiole dorsum finely punctulate. Disc of postpetiole smooth and shining and first gastral tergite unsculptured except for the basigastral costulae which form an uninterrupted band across the base of the sclerite. Spongiform appendages massively developed in profile. In dorsal view the sides and posterior margin of the petiole node surrounded by continuous thick spongiform material. The postpetiole with an anterior spongiform transverse strip and with the lateral spongiform material projecting beyond the lateral outlines of the disc in dorsal view. Posterior margin of postpetiole disc with a continuous broad spongiform strip which is narrower centrally than at the sides but not broken. Base of first gastral tergite with a transverse spongiform band which is as broad as, and is overlapped by, that on the posterior postpetiolar margin. Colour medium to dark brown.

PARATYPE WORKERS. TL 2.0–2.2, HL 0.58–0.64, HW 0.35–0.38, CI 56–63, ML 0.06–0.08, MI 9–12, SL 0.26–0.28, SI 73–78, PW 0.22–0.26, AL 0.54–0.62 (20 measured).

As holotype but with maximum diameter of eye 0.11–0.15×HW. In some the longitudinal nature of the minute pronotal rugulae is better shown than in others, which are less regular and like the holotype. The maximum number of scale-like hairs fringing the posterior dorsal margin of the petiole node appears to be 6 (3 on each side of the midline) though the outermost on each side may actually arise on the lateral margin of the node and project backward. The basal lamella of the mandible consists of a high rectangle with concave sides, visible in one of the paratypes.

Holotype worker, **Ivory Coast**: Issoneu, 12.x.1980 (V. Mahnert & J.-L. Perret) (MHN).

Paratypes. **Ivory Coast**: 14 workers and 1 female with same data as holotype; 9 workers, Man, 7.x.1980 (V. Mahnert & J.-L. Perret); 7 workers and 1 female, Dropleu, 10.x.1980 (V. Mahnert & J.-L. Perret); 4 workers, Tai Forest, 17.x.1980 (V. Mahnert & J.-L. Perret) (MHN; BMNH; MCZ).

Non-paratypic material examined. **Ghana**: Tafo (D. Leston); Mampong (P. Room). **Cameroun**: Nkoemvon (D. Jackson); nr Yaounde (G. Terron). **Angola**: Salazar (P. Hammond); nr Gubela (P. Hammond).

Dimensions of the non-paratypic samples fall within the range given for the paratypes.

The closest relative of *shara* is *cavinasis* which shares the remarkable dense suborbicular pilosity. Details for the separation of the two are given under the latter name.

Smithistruma truncatidens Brown

(Figs 10, 13)

Smithistruma (*Smithistruma*) *truncatidens* Brown, 1950b: 43, pl. 3, fig. 1. Holotype and paratype workers, TANZANIA: Lupembe (K. Bock) (paratype in MCZ) [examined]. [See also Brown, 1953a: 127.]

WORKER. TL 2.4–3.0, HL 0.62–0.72, HW 0.46–0.54, CI 72–76, ML 0.10–0.12, MI 14–18, SL 0.28–0.34, SI 58–65, PW 0.30–0.35, AL 0.64–0.78 (12 measured).

Basal lamella of mandible a high rectangle, truncated apically and with shallowly concave sides. The lamella is followed without a diastema by 5 relatively large teeth, two slightly smaller teeth, a row of 4 minutes denticles and a small apical tooth. Anterior margin of clypeus concave and equipped with a series of 8 scale-like hairs, arranged in 4 pairs, which are curved towards the midline and project out over the mandibles. Lateral margins of clypeus with a continuous row of anteriorly curved spatulate to spoon-shaped large hairs which form a fringe around the clypeus. Clypeal dorsum and cephalic dorsum with numerous small flattened hairs which are curved anteriorly and appear scale-like in full-face view. The posteriormost one or two rows of hairs, close to the occipital margin, are longer, narrower and more erect. Sides of head with freely projecting elongate feebly clavate hairs which curve upwards and often weakly forwards from their points of origin. Antennal scapes bent at the basal third, broadest at or just distal to the

bend. Leading edge of scape quite evenly rounded at the bend and with a series of freely projecting long stout hairs. Dorsum of head densely punctate and matt, usually with a coarsely granular appearance but sometimes with the punctures more widely spaced. Clypeal dorsum much less strongly sculptured, frequently shining. Maximum diameter of eye $0.14-0.16 \times \text{HW}$. Pronotum not sharply marginate laterally, the dorsum lacking a median longitudinal ridge or carina. With the alitrunk in profile the anterior half of the mesonotum elevated and on the same level as the pronotal dorsum. Posterior half of mesonotum and the propodeum markedly depressed below this level. Metanotal groove absent, the posterior half of the mesonotum and the propodeal dorsum forming a single uninterrupted surface. Propodeal teeth triangular and acute, weakly elevated and with a narrow infradental lamella. Dorsal alitrunk with a number of appressed short hairs which are most easily seen on the pronotum. Erect hairs on alitrunk restricted to a single long stout pair which are weakly clavate apically, situated on the raised anterior portion of the mesonotum. In some samples a shorter second pair of erect hairs is present further back on the mesonotum. Flagellate hairs absent. Dorsal surfaces of petiole, postpetiole and first gastral tergite with numerous suberect to erect stout hairs which are simple or feebly clavate. Sides of alitrunk punctate but the upper and posterior portions of the mesopleuron, the metapleuron and the anteriormost part of the propodeal side forming an extensive smooth area on which punctures are extremely sparse or absent. Dorsum of pronotum punctate, usually densely so but may be more widely scattered in some. Frequently the walls of the individual punctures align to form feeble rugulae and the surface appears granular. Remainder of dorsal alitrunk more sharply reticulate-punctate, the punctures extending onto the propodeal declivity between the teeth. Petiole node punctate dorsally. Disc of postpetiole commonly unsculptured but in many showing faint longitudinal costulae towards the sides. In some, often larger individuals, the costulae are more extensive and occur over most or all of the postpetiolar dorsum. First gastral tergite unsculptured except for the conspicuous basal costulae. Spongiform appendages of pedicel segments strongly developed in profile. In dorsal view the petiole node with a transverse spongiform strip on the posterior margin and the postpetiole with a narrow strip which is broadest posterolaterally but which becomes narrower medially and is vestigial or interrupted at the centre of the margin. At this point the posterior face of the postpetiole disc is itself indented. Base of first gastral tergite with a transverse lamellar strip which is not spongiform and which is traversed by the basigastral costulae, the latter arising at the anterior margin of the sclerite. Colour dull yellow to light yellowish brown.

S. truncatidens is closely related to *datissa*, *dendexa*, *gatuda* and *hensekta*. Characters separating *truncatidens* from the last of these are tabulated under *hensekta*. *S. datissa* is a more darkly coloured species which lacks the freely projecting hairs on the sides of the head which are seen in *truncatidens*. It also lacks standing hairs on the dorsal alitrunk and has the postpetiolar disc strongly costulate. In *gatuda* the alitrunk and petiole dorsum are glassy smooth with widely scattered punctures and the sides of the alitrunk are unsculptured except for the central mesopleuron. The eyes are distinctly smaller, measuring only $0.09 \times \text{HW}$ in *gatuda* as opposed to $0.14-0.16 \times \text{HW}$ in *truncatidens*. Finally *dendexa*, a smaller species, is separated by its possession of fine longitudinal rugulose sculpture on the pronotum, which is not present in *truncatidens*.

MATERIAL EXAMINED

Rwanda: Kayove (P. Werner). **Burundi:** Bujumbura (A. Dejean); Bugarama (A. Dejean); Imbo Plain (A. Dejean). **Kenya:** Nairobi (V. Mahnert); nr Narok (V. Mahnert & J.-L. Perret); Embu, Irangi Forest Sta. (V. Mahnert & J.-L. Perret). **Tanzania:** Lupembe (K. Bock).

The *transversa*-group

With the characters of the *emarginata*-group but the basal lamella of the mandible is an evenly rounded broad lobe, visible in full-face view even when the mandibles are closed. Infradental lamella on propodeum broad and conspicuous.

Recorded only from South Africa, *transversa* is certainly a direct derivative of the *emarginata*-group which has modified the shape of the mandibular basal lamella from the high triangular or rectangular structure seen in that group to the low broad lobe which it possesses, without altering the basic dental pattern of the parent stock.

Smithistruma transversa (Santschi)

Strumigenys transversa Santschi, 1913a: 258 (diagnosis in key). Holotype worker, SOUTH AFRICA: Natal (not in NMB; presumed lost).

Smithistruma (Smithistruma) transversa (Santschi) Brown, 1948: 105; 1953a: 127.

WORKER. TL 2.2–2.4, HL 0.62–0.66, HW 0.42–0.46, CI 68–71, ML 0.12–0.13, MI 19–20, SL 0.27–0.28, SI 60–64, PW 0.26–0.28, AL 0.58–0.62 (5 measured).

Basal lamella of mandible an elongate high broadly rounded lobe whose length along the base is approximately the same as the length of the masticatory margin occupied by the principal row of 5 teeth, and which is clearly visible even when the mandibles are closed. Height of the basal lamella equal to that of the longest of the teeth. Principal row of 5 teeth followed distally by 2 slightly smaller teeth and 4 minute denticles before the small apical tooth. Anterior clypeal margin transverse to very shallowly evenly convex, equipped with 8 scale-like hairs which project forwards over the mandibles and which are usually slightly curved medially. Lateral margins of clypeus very slightly convergent anteriorly and with an unbroken series of long broad spatulate to spoon-shaped hairs which project freely and are curved anteriorly. Dorsum of clypeus and cephalic dorsum with numerous scale-like to spoon-shaped anteriorly curved short hairs; those on the clypeus smaller than those on the cephalic dorsum. Upper scrobe margins and sides of the occipital lobes with an unbroken sequence of sharply anteriorly curved spoon-shaped hairs which are closely applied to the surface. Flagellate hairs absent. Antennal scape narrow basally, bent at about the basal third and broadest just beyond the bend. Leading edge of scape with a projecting row of strong spatulate to spoon-shaped hairs, the dorsum of the scape also with spatulate hairs present. Eyes relatively large, maximum diameter $0.18 \times HW$, greater than the maximum width of the scape. Entire dorsum of head finely and densely reticulate-punctate. Pronotum not marginate laterally and without a median longitudinal ridge or carina dorsally. Flagellate hairs absent. Metanotal groove not impressed and propodeal teeth subtended by a broad and conspicuous infradental lamella. Dorsal alitrunk with narrowly spatulate short hairs, most of which are reclinate but a few of which may be subdecumbent. Petiole and postpetiole with similar pilosity and also with elongate quite stout simple hairs which are directed posteriorly. First gastral tergite with a transverse row of 4 erect hairs basally, grouped in pairs on each side of a central broad gap. Remainder of first tergite hairless except for a widely separated pair close to the apical margin. Pleurae of alitrunk mostly smooth, usually with some punctures basally and on upper anterior portion of the mesopleuron. Pronotal and mesonotal dorsa finely and densely reticulate-punctate but dorsum of propodeum mostly or entirely smooth; usually with some laterally situated punctures and with punctures on the declivity between the propodeal teeth. Dorsum of petiole node distinctly broader than long, sometimes indented medially; unsculptured or at most with superficial vestiges of punctate sculpture. Postpetiole smooth and shining. First gastral tergite unsculptured except for the basigastral costulae, which radiate from each side of a smooth median area. Spongiform appendages of pedicel segments strongly developed in profile. In dorsal view the petiole node with a broad posterior strip; the anterior margin of the postpetiole with a narrow strip, the posterior margin bordered by a spongiform strip which is broad posterolaterally but rapidly narrowing medially, very narrow or interrupted centrally where the postpetiole itself is indented. Base of first gastral tergite with a transverse strip which has its anterior free margin concave medially and convex at the sides where the costulae arise. Colour dark brown to blackish brown.

As the holotype of this species has not been found it is necessary to rely on the inadequate descriptions presented by Santschi (1913a; 1914c). Accordingly I attach the name *transversa* to four short series from Natal and Cape Province in South Africa which match the available descriptions tolerably well.

This species is peripheral to the *emarginata*-group but is isolated by its uniquely shaped mandibular basal lamella and broad infradental lamellae on the propodeum.

MATERIAL EXAMINED

South Africa: Natal, Zululand, Eshowe (*R. E. Turner*); Dukuduku Forest Res. (*W. L. & D. E. Brown*); Cape Prov., Pondoland, Port St Johns (*R. E. Turner*); Alexandria Forest Res. (*L. Weatherill & W. L. Brown*).

The *terrioni*-group

(Fig. 7)

Sharing the characters noted in the *emarginata*-group diagnosis (and particularly resembling the *chyatha*-complex) but with a very distinctly modified mandible form. Blade of mandible narrow and somewhat elongated (MI, however, within range of *emarginata*-group members), with a long diastema between the basal lamella and the basalmost tooth, the diastema much longer than the height of the basalmost tooth. Basal dental series usually of 6 but rarely of 7 small teeth (the number may vary on opposite mandibles in

the same specimen), the next tooth relatively large, by far the largest tooth on the masticatory margin. Distal to this large tooth are 3 small teeth, a single slightly larger tooth, 4 minute denticles and an apical tooth, making a total of 16-17 teeth in all on the margin.

This group, represented by the single species *terronei* from Cameroun, appears to be derived directly from the *chyatha*-complex of the *emarginata*-group by the modification of the mandible outlined above. In the *emarginata*-group the basal lamella is a high truncated triangle or a concave-sided high rectangle which is followed immediately by a row of 5 relatively large teeth, without a diastema between the basal lamella and the basalmost tooth. The 5 teeth constituting the principal row vary in size both between species and sometimes within species, but always one of these five is the largest tooth on the margin. Distal to the row of 5 are 2 smaller teeth (sometimes only fractionally smaller) which are themselves followed by 4 minute denticles and an apical tooth, making a total of 12 teeth in all on the margin. Comparing the mandibles of the two groups it appears that the basal row in *terronei*, which terminates in the relatively very large tooth 7 (or rarely 8), is homologous to the basal row of 5 enlarged teeth in the *emarginata*-group which have been spread out because of the elongation of the blade, and small secondary teeth have developed in *terronei* to fill the gaps so formed. Teeth 6 and 7 of the *emarginata*-group are represented in *terronei* by four teeth, the apicalmost of which is the same as tooth 7 in the *emarginata*-group. Apically both have 4 denticles and a small apical tooth.

***Smithistruma terronei* sp. n.**

(Fig. 7)

HOLOTYPE WORKER. TL 2.6, HL 0.74, HW 0.51, CI 69, ML 0.14, MI 19, SL 0.32, SI 63, PW 0.32, AL 0.76.

Mandibles narrowly triangular, with a distinct diastema separating the basal lamella (concealed by the clypeus but visible in anterior view) from the basalmost tooth, the length of the diastema conspicuously much greater than the height of the basalmost tooth. Counting from the base the mandibles with 6 relatively small teeth followed by a much larger seventh tooth, this tooth by far the largest on the masticatory margin and more than twice larger than those proximal to it. Of the row of six teeth preceding the enlarged seventh the first, third and fifth are larger than the second and fourth, the sixth is slightly smaller than the fifth but slightly larger than the fourth. The large seventh tooth is followed distally by 3 small teeth, a larger tooth, 4 minute denticles and a small apical tooth, making a total of 16 teeth altogether. Both mandibles similarly armed in the holotype but in one of the paratypes the left mandible has an additional minute denticle between the third and fourth tooth from the base, and this mandible thus has a total of 17 teeth. Anterior clypeal margin shallowly concave, with a series of 8 short scale-like hairs which are truncated apically; the outermost pair the largest. Anterolateral angles of clypeus rounded, with medially curved spoon-shaped hairs, the sides of the clypeus divergent posteriorly and with larger anteriorly curved spoon-shaped hairs. In full-face view the preocular laminae divergent anteriorly, the upper scrobe margins divergent posteriorly, the lateral margins of the occipital lobes evenly convex and the occipital margin deeply but evenly concave. Upper scrobe margins just behind the frontal lobes shallowly depressed on each side of a central higher area. Antennal scapes bent near base, flattened and broadest just distal to the bend, the leading edges with a row of freely projecting long spatulate to spoon-shaped hairs. Entire dorsum of head densely punctate. Ground-pilosity everywhere of minute decumbent to appressed stubble-like hairs, without standing pilosity of any description on the cephalic dorsum and without flagellate hairs. Eye moderate in size, with more than 15 ommatidia. Pronotum marginate anteriorly, the alitrunk without lateral margination but the propodeal dorsum separated from the sides by bluntly rounded angles. In dorsal view the pronotum without a median longitudinal ridge or carina and the metanotal groove absent. In profile the mesonotum shallowly convex, confluent with the shallowly sloping surface of the pronotum anteriorly but sloping more steeply posteriorly. The posterior half of the mesonotum forming a single surface with the propodeal dorsum. Propodeal teeth strong and stout, the infradental lamella vestigial and represented only by a narrow rim down the concavity of the declivity below the propodeal teeth. Sides of alitrunk mostly with scattered quite sharply defined relatively large punctures, the spaces between which are smooth, but the anterior portion of the mesopleuron finely reticulate-punctate, the punctures much smaller than elsewhere. Dorsal alitrunk with scattered punctures, the pronotum also with vestiges of exceptionally fine rugulae. Dorsal alitrunk only with scattered minute appressed hairs, without standing pilosity of any description and lacking flagellate hairs. Pedicel segments in profile with spongiform appendages massively developed. Dorsum of petiole node sculptured with strong scattered punctures and bordered posteriorly by a continuous transverse spongiform strip which is

densest posterolaterally. Postpetiole in dorsal view with the disc smooth and unsculptured, completely surrounded by dense spongiform material. Posterior transverse spongiform strip of postpetiole feebly sinuate medially but not distinctly indented. Base of first gastral tergite with a narrow but dense transverse spongiform strip. Basigastral costulae narrow and sharply defined, not traversing the basal spongiform tissue. Pedicel segments and gaster without standing pilosity, with minute appressed ground-pilosity and the posterior margins of the petiole and postpetiole with 1-2 pairs of larger appressed spatulate hairs which project backwards over the spongiform strips. Colour black.

PARATYPE WORKERS. TL 2.5-2.6, HL 0.72-0.74, HW 0.49-0.51, CI 68-69, ML 0.13-0.14, MI 18-19, SL 0.31-0.32, SI 62-63, PW 0.32-0.33, AL 0.74-0.78 (3 measured).

As holotype but with 7-8 short hairs bordering the concave anterior clypeal margin and one paratype with an extra mandibular tooth as discussed above.

Holotype worker, **Cameroun**: nr Yaounde, sample 1911 (*G. Terron*) (ENSA).

Paratypes. 4 workers with same data as holotype (ENSA; BMNH).

The unique construction of the mandible immediately separates *terronei* from all its Afrotropical congeners.

The *weberi*-group

(Figs 14-16)

Antennae with six segments. Basal lamella of mandible a high triangle which is truncated apically or a high rectangle with concave sides, never a low rounded lobe. Often a small diastema present between the basal lamella and the basalmost tooth. Principal dental row of mandible with 5 teeth but the next two teeth distally may sometimes also be enlarged. Sculpture very coarse on body and usually also coarse on head, very characteristic, the pronotum with strong rugae or sulci which are usually longitudinal. Anterior clypeal margin in full-face view most often approximately transverse but sometimes extremely shallowly concave or convex. Lateral and anterior margins of clypeus with a series of irregular projecting simple hairs which may be acute, truncated or even feebly clavate apically, but which are never spatulate nor spoon-shaped and which do not form an orderly fringing row such as is characteristic of the *emarginata*- and related groups. Body pilosity consisting of an array of fine simple hairs which are usually dense and are generally wavy, twisted, bent or otherwise deformed, but without bizarre hairs. Flagellate hairs absent from pronotal humeri or at least indistinguishable from the other pilosity. Leading edges of antennal scapes with freely projecting simple hairs. Pronotum not marginate laterally and lacking a median dorsal ridge or carina. Propodeum without or at most with a vestigial infradental lamella.

The obvious outstanding character of this peculiarly African group of species is the heavy coarse sculpture. No other species or species-group known in the world approaches the members of the *weberi*-group in this aspect and this character alone will serve to separate the twelve members of the group from their Afrotropical congeners.

The group falls into two informal complexes depending on whether the postpetiolar disc is sculptured or smooth. In the *minkara*-complex (*enkara*, *minkara*, *nykara*) the disc of the postpetiole is strongly and clearly longitudinally costulate. Of the three species in this complex two are West African, with *minkara* known only from Ivory Coast and *enkara* from Ivory Coast and Ghana; the third species, *nykara*, has only been found in Zimbabwe to the present. In the second, *weberi*-complex (*arahana*, *fenkara*, *kerasma*, *malaplastax*, *mekaha*, *placora*, *synkara*, *tolomya*, *weberi*), the postpetiolar disc is smooth and shining. All the species of this complex are from West or central Africa and the species range from Nigeria to Angola.

Smithistruma arahana sp. n.

HOLOTYPE WORKER. TL 2.5, HL 0.65, HW 0.40, CI 61, ML 0.05, MI 8, SL 0.28, SI 70, PW 0.30, AL 0.64.

Anterior clypeal margin transverse, the anterolateral angles rounded and the lateral margins feebly divergent posteriorly. Outline of preocular laminae shallowly convex in full-face view, broadest at about their midlength and slightly convergent both anteriorly and posteriorly. Lateral margins of clypeus with simple projecting hairs, the shorter of which are curved anteriorly and the longer of which curve upwards or forwards and upwards. Clypeal and cephalic dorsa equipped with simple fine ground-pilosity, the hairs of the ground-pilosity short and arched forward so that their apices are in contact or nearly in contact with the surface. Projecting above the ground-pilosity are longer stouter simple hairs which are erect or nearly so.

On the clypeal dorsum most of these hairs curve forward then upward but the posteriormost clypeal row are shallowly sinuate and are also the longest. Behind the clypeus similar erect curved to sinuate hairs are present, none of which are longer than the posterior clypeal row. Close to the occipital margin are a few hairs which are angled and have their apical portions narrowly flagellate. In full-face view the sides of the head with numerous projecting simple hairs. Antennal scapes slightly bent in the basal third, broadest at about the midlength, the leading edge with anteriorly projecting simple hairs most of which are upcurved in their distal halves. Dorsum of head coarsely and very densely reticulate-rugulose everywhere, the clypeus less strongly sculptured. Promesonotum not marginate, the pronotal dorsum without a median longitudinal carina. Metanotal groove not impressed. Propodeal teeth broad and triangular, short, the infradental lamellae vestigial and represented only by a narrow rim; outline of the propodeal declivity in profile distinctly concave. Sides of pronotum and propodeum coarsely rugose, the pleurae smooth. Mesopleuron with a dense vertical band of fine punctulae close to its junction with the metapleuron but otherwise the pleurae only with very widely scattered fine punctulae. Promesonotal dorsum coarsely and densely rugose, the propodeal dorsum smooth except for a few feeble anteriorly situated punctures. Dorsal alitrunk with numerous fine simple hairs. Spongiform appendages of pedicel segments massively developed in profile. Outline of petiolar ventral process concave at about its midlength, the ventral postpetiolar lobe very large indeed. In dorsal view the petiole node rugose and distinctly broader than long, with a very thick posterior ruff of dense spongiform material, the thickness of which is greater than the length of the exposed dorsum of the node. Laterally the spongiform tissue laps around the sides of the node almost to the anterolateral angles. Disc of postpetiole in dorsal view completely surrounded by dense thick spongiform material, the disc uneven and with scattered punctures, not glassy smooth as is usual in the *weberi*-complex but lacking the strong costulae characteristic of the *minkara*-complex. Anterior margin of postpetiolar disc bordered by a dense spongiform strip, the sides with dense spongiform tissue which is narrowest anteriorly and extremely broad posterolaterally. Posterior spongiform strip broad and with a narrow median cleft. Base of first gastral tergite with a broad very finely and densely spongiform transverse strip, the tergite posterior to this with short basigastral costulae. Dorsal surfaces of petiole, postpetiole and gaster with numerous fine simple hairs. Colour dull brownish yellow to light brown.

PARATYPE WORKER. TL 2.6, HL 0.70, HW 0.43, CI 61, ML 0.06, MI 9, SL 0.30, SI 70, PW 0.32, AL 0.70.

As holotype but disc of postpetiole less noticeably punctate.

Holotype worker, **Cameroun**: nr Yaounde, sample D2 (*G. Terron*) (ENSA).

Paratype. 1 worker, **Cameroun**: nr Yaounde, sample 2419 (*G. Terron*) (BMNH).

Among the members of the *weberi*-group six species combine the characters of having the postpetiolar disc without dense costulate sculpture and having the metanotal groove unimpressed. Of these only *arahana* has the spongiform tissue behind the petiole node very densely and massively developed. In dorsal view the spongiform material is thicker than the length of the node in *arahana*, whereas in the five other species (*fenkara*, *malaplastax*, *placora*, *synkara*, *tolomyia*) it is decidedly narrower than the length of the node, in some being merely a lamella.

Smithistruma enkara sp. n.

(Fig. 15)

HOLOTYPE WORKER. TL 2.4, HL 0.63, HW 0.41, CI 65, ML 0.08, MI 13, SL 0.28, SI 68, PW 0.28, AL 0.62.

Dentition as described for *minkara* but basal lamella of mandible (from non-paratypic material) a high truncated rectangle with concave sides; a small diastema present between the basal lamella and the basalmost tooth. Anterior clypeal margin transverse, the anterolateral angles of the clypeus rounded and the sides slightly convergent anteriorly. Lateral margins of clypeus with numerous projecting curved to flagellate simple fine hairs which are also present bordering the sides of the head. Dorsal surface of clypeus and dorsal surface of head with abundant fine simple hairs which are irregular to flagellate and mostly arched over so that the apices of most of them are directed back down towards the surface or are roughly parallel with the surface. All the cephalic hairs are fine and simple, without erect to suberect longer stouter straight hairs pointing up from the dorsum. Entire dorsum of head strongly reticulate-rugulose. Antennal scapes only very feebly bent at about the basal third, broadest at about the midlength, the leading edges arched convex and equipped with projecting simple hairs similar to those on the cephalic dorsum. Maximum diameter of eye 0.12×HW. With the alitrunk in profile the mesonotum slightly elevated, the metanotal groove not impressed. Sides of pronotum not sharply marginate and the dorsum lacking a median longitudinal ridge or carina. Propodeal teeth narrow and acute, subtended by a vestigial infradental lamella. Pronotum, mesonotum, petiole, postpetiole and gastral tergites with numerous fine

simple flagellate hairs, many of which are arched over towards the surface, as on the head. Sides of pronotum rugose, pleurae and sides of propodeum punctate. Pronotal dorsum densely coarsely longitudinally rugose, with a few cross-meshes; spaces between the rugae mostly narrow and smooth. Mesonotum with irregular strong rugae the spaces between which are punctate. Propodeal dorsum punctate, the declivity smooth. Petiole node irregularly but strongly rugose dorsally, the postpetiolar disc strongly longitudinally costulate-rugose. Basigastral costulae dense and strongly developed, extending almost the length of the sclerite centrally, less extensive on the sides. Spongiform appendages of pedicel segments massively developed in profile. In dorsal view the posterior margin of the petiole node with a broad spongiform strip whose posterior border is concave medially and which is broadest posterolaterally where it forms a rounded lobe. Postpetiole in dorsal view with the disc completely surrounded by thick spongiform material which is broadest posterolaterally and has the posterior strip indented medially. First gastral tergite with a broad spongiform band basally which is overlapped by the posterior spongiform strip of the postpetiole. Colour dark brown, the gaster blackish brown.

PARATYPE WORKER. TL 2.4, HL 0.63, HW 0.40, CI 63, ML 0.07, MI 11, SL 0.28, SI 70, PW 0.28, AL 0.62.

As holotype but maximum diameter of eye $0.13 \times HW$.

Holotype worker, **Ivory Coast**: Abidjan, Banco Nat. Pk., primary forest, 3.iii.1977, in dead trunk (*I. Löbl*) (MHN).

Paratype. 1 worker with same data as holotype (BMNH).

Non-paratypic material examined. **Ghana**: Tafo (*D. Leston*); Tafo (*C. A. Collingwood*). **Ivory Coast**: Lamto (*W. H. Gotwald*). **Cameroun**: nr Yaounde (*G. Terron*).

The five specimens constituting the non-paratypic material are very close to the holotype but have some minor differences. Principal among these is a rugulose propodeal dorsum, not seen in the type-series. With so little material available I cannot assess the significance of this and I am not prepared to split them further at present.

Of the three species in this group which possess a sculptured postpetiolar disc, *minkara* is easily differentiated by its very long narrow head, CI 54–58 as opposed to CI 63–68 in *enkara* and *nykara*. These last two species are differentiated by the characters given in the key plus the fact that *nykara* has long stout evenly curved clypeal hairs as well as the finer pilosity, such long hairs being absent in *enkara*. With the pedicel segments in profile the lateral spongiform appendage of the postpetiole touches or is confluent with the transverse strip bordering the anterior postpetiolar margin in *enkara*; in *nykara* there is a distinct gap between them.

Smithistruma fenkara sp. n.

HOLOTYPE WORKER. TL 2.4, HL 0.67, HW 0.43, CI 64, ML 0.07, MI 10, SL 0.31, SI 72, PW 0.30, AL 0.66.

Dentition not clearly visible as mandibles closed but apparently like that described for *malapilax*. Anterior clypeal margin transverse, the sides irregular, shallowly convex and weakly convergent anteriorly. With the head in full-face view the lateral clypeal margins with a few simple short anteriorly curved hairs on the posterior half, but the pilosity dominated by the numerous stout hairs which project anterolaterally are clavate apically and upcurved in their distal half to third. Sides of head with numerous similar projecting clavate hairs which are curved forwards or upwards, the posterior curve of the occipital lobes with weakly flagellate hairs replacing the clavate pilosity. In profile the clypeal dorsum with clavate hairs anteriorly which curve upwards. The surface of the clypeus behind these hairs is shallowly concave and hairless. Posteriorly the clypeal dorsum with a transverse row of sinuate clavate erect hairs which are slightly longer than those situated anteriorly. Dorsum of head from posterior margin of clypeus to vertex with simple short ground-pilosity which is curved anteriorly and closely applied to the surface, and with longer stout clavate hairs which are erect to suberect, feebly inclined or curved anteriorly, all of about the same length and stature and about equal in length to the posterior clavate clypeal row. Sloping portion of head behind the vertex and in front of the occipital margin with weakly flagellate hairs replacing the clavate pilosity. Antennal scapes feebly bent at about the basal third, the leading edge with a projecting row of long curved hairs which are weakly clavate apically. Maximum diameter of eye $0.16 \times HW$. Entire dorsum of head densely reticulate-rugulose. Pronotum not marginate laterally, without a median longitudinal ridge or carina dorsally. With the alitrunk in profile the metanotal groove absent, the propodeal teeth narrowly triangular and subtended by a narrow infradental lamella whose free margin is evenly concave. Sides of pronotum and propodeum irregularly rugulose, the pleurae punctate but the metapleuron mostly smooth centrally. Pronotal dorsum strongly longitudinally rugose, with a few cross-meshes and with the inter-spaces weakly punctate to granular. Mesonotum more strongly reticulate-rugose than pronotum, especial-

ly posteriorly. Propodeal dorsum punctate, with rugulae at the sides and one or two weak transverse rugulae close to the declivity, the latter smooth. Petiole node irregularly rugose dorsally, the postpetiole smooth and shining. First gastral tergite unsculptured except for the strong basigastral costulae. Dorsal surfaces of pronotum, mesonotum, petiole, postpetiole and gaster with numerous fine weakly flagellate hairs. Spongiform appendages of pedicel segments massively developed in profile. In dorsal view the petiole node with a broad posterior strip which is narrowed posteromedially. Postpetiole completely surrounded by thick spongiform material in dorsal view, the posterior strip deeply indented medially. First gastral tergite with a thick basal spongiform ruff. Colour medium brown, the gaster blackish brown.

PARATYPE WORKER. TL 2.3, HL 0.68, HW 0.43, CI 63, ML 0.07, MI 10, SL 0.30, SI 70, PW 0.30, AL 0.63. As holotype.

Holotype worker, **Angola**: Dundo, Carisso Park, gallery forest, R. Luachimo, 7°22'S, 20°50'E, 26.iv.1963, 'berlesate by native collector' (MCZ).

Paratype. 1 worker with same data as holotype (BMNH).

S. fenkara is closest related to *placora*, *tolomyia* and *synkara*. The characters linking them and those which separate them are noted under *synkara*.

S. fenkara is separated from *arahana* by its massive development of the posterior petiolar spongiform appendage, as discussed under the latter name; *fenkara* is differentiated from *malaplex* by the lack of specialized hairs on the head behind the clypeus in the latter.

Smithistruma kerasma sp. n.

(Fig. 16)

HOLOTYPE WORKER. TL 2.5, HL 0.68, HW 0.44, CI 65, ML 0.06, MI 9, SL 0.30, SI 68, PW 0.32, AL 0.69.

Mandibular dentition (from a paratype) consisting of a high truncated rectangular basal lamella with concave sides, followed by a small diastema and a principal row of 5 relatively large teeth. Distal to this with 2 slightly smaller teeth, 4 minute denticles and a small apical tooth. Anterior clypeal margin broadly shallowly convex, sides of the clypeus irregular and only very weakly convergent anteriorly to the rounded anterolateral angles. Preocular laminae weakly convex in full-face view, the lateral margins of the head rugular and uneven. Lateral margins of clypeus in full-face view with a few simple anteriorly curved short hairs and with longer stouter simple hairs which project anterolaterally from the margin and are curved upwards. Sides of head with abundant fine simple projecting hairs which are curved anteriorly in their apical halves. Hairs on clypeal dorsum fine, more or less vertical and curved towards the midline. Dorsum of head with abundant fine simple hairs which are erect or suberect basally but which are angled anteriorly in their apical halves, those situated more posteriorly on the dorsum being in general more strongly bent forward than those situated more anteriorly. The most strongly bent hairs are inverted L-shaped. All hairs on dorsal head approximately the same size and stature, without hairs which are obviously longer and stouter than others. Dorsum of head coarsely irregularly reticulate-rugose, the clypeus similarly but less intensely sculptured. Antennal scapes scarcely bent basally, broadest at about the midlength and the leading edge with projecting curved simple hairs which also occur on the dorsum of the scape. Maximum diameter of eye $0.16 \times HW$. Pronotum not marginate laterally, without a median longitudinal ridge or carina dorsally. In profile the alitrunk with the mesonotum strongly convex, sloping down posteriorly to a broad, shallow but distinctly impressed metanotal groove. Dorsal outline of propodeum raised behind the metanotal groove, then sloping downwards to the triangular propodeal teeth. Infradental lamellae of propodeum vestigial, their free margins strongly concave. Pronotal and mesonotal dorsa with numerous erect to suberect long fine simple hairs which are bent in their apical halves and often directed anteriorly. Dorsal surfaces of petiole, postpetiole and gaster with elongate simple hairs which are subflagellate to flagellate or sometimes arched over. Dorsal (outer) surfaces of middle and hind tibiae with projecting simple subflagellate hairs. Sides of pronotum and propodeum coarsely rugose, the pleurae punctate; the punctures of the mesopleuron smaller denser and more sharply defined than those on the metapleuron. Pronotal dorsum coarsely longitudinally rugose, the rugae broad and high and the spaces between them smooth. Mesonotum, metanotal groove and base of propodeal dorsum strongly rugose but the rugae less massive and less regular than on the pronotum. Central area of propodeal dorsum with irregular punctures, declivity smooth. Petiole dorsum coarsely rugose, postpetiole dorsum smooth and shiny. First gastral tergite unsculptured except for the regular strong short basal costulae. With pedicel segments in profile the spongiform appendages massively developed. In dorsal view the posterior margin of the petiole with a very broad spongiform strip which has its free posterior margin shallowly concave medially and which is broadest posterolaterally where its length is equal to that of the free side of the node in front of it. Disc of

postpetiole thickly surrounded by spongiform material on all sides in dorsal view. The broadly and shallowly concave anterior margin of the postpetiole is equipped with a thick ruff-like transverse spongiform band which is contiguous with the lateral spongiform material on each side. Convex posterior margin of postpetiolar disc indented medially and bearing an extremely broad spongiform band whose posterior margin is also indented medially. The spongiform material on each side of the median indentation is as broad as the disc is long. Base of first gastral tergite with a thick spongiform ruff from which the basigastral costulae emerge. Colour dark brown.

PARATYPE WORKERS. TL 2.5–2.6, HL 0.68–0.70, HW 0.44–0.45, CI 64–66, ML 0.06–0.07, MI 9–10, SL 0.30–0.31, SI 68–70, PW 0.32–0.33, AL 0.68–0.72 (9 measured). As holotype.

Holotype worker, **Cameroun**: Nkoemvon, 16.iii.1980 (*D. Jackson*) (BMNH).

Paratypes. 9 workers with same data as holotype (BMNH; MHN; MCZ; ENSA).

Among the nine species of this group which have the postpetiole unsculptured only three (*kerasma*, *mekaha*, *weberi*) have the metanotal groove impressed. *S. kerasma* and *mekaha* differ together from *weberi* as follows.

<i>kerasma</i> and <i>mekaha</i>	<i>weberi</i>
Median indentation of posterior spongiform appendage of postpetiole shallow, not approaching the margin of the disc.	Median indentation of posterior spongiform appendage of postpetiole reaching the margin of the disc.
Spongiform material bordering margin of postpetiole posteriorly as wide from front to back as the disc of the postpetiole is long.	Spongiform material bordering margin of postpetiole posteriorly distinctly narrower from front to back than the disc of the postpetiole is long.
Propodeal teeth long, the infradental lamella vestigial and its free margin evenly concave.	Propodeal teeth short and broad, the infradental lamella conspicuous and its free margin straight or feebly sinuate, not evenly concave.
All hairs on dorsum of head of same construction and approximate size, not divided into appressed small ground-pilosity and much larger erect subclavate hairs.	Hairs on dorsum of head of two forms, divided into small appressed ground-pilosity and much larger erect subclavate hairs.
Larger species, HL 0.68–0.70 HW 0.44–0.47.	Smaller species, HL 0.61, HW 0.39.
Second tooth of principal mandibular row the longest, the first (basalmost) and third about equal in length.	Second tooth of principal mandibular row the longest but the first (basalmost) very much smaller than the third.

S. kerasma and *mekaha* are a very closely related pair but are quickly separated by the form of the cephalic pilosity. In *kerasma* the principal cephalic hairs are erect or suberect basally but pass through an obtuse angle so that their apical halves are directed anteriorly. In *mekaha* the cephalic hairs lack this structure, instead being evenly arched forward from base to apex, their apices generally in contact with the surface of the head some distance in front of their point of origin.

Smithistruma malaplast sp. n.

HOLOTYPE WORKER. TL 2.1, HL 0.64, HW 0.40, CI 63, ML 0.07, MI 11, SL 0.28, SI 70, PW 0.28, AL 0.62.

Basal lamella of mandible a high truncated rectangle with concave sides, separated from the principal tooth row by a small diastema. Of the 5 teeth following the diastema the first is the shortest and the second is the longest. The principal row of 5 teeth is followed by two slightly smaller teeth, 4 minute denticles and a small apical tooth. Anterior clypeal margin transverse, the sides feebly convergent. In full-face view the lateral clypeal margins with a more ventrally situated series of projecting fine simple hairs which are curved anteriorly, often sharply so. Situated above this row on the sides of the clypeus are numerous longer stouter weakly clavate hairs which project laterally or anterolaterally and are upcurved or backcurved in the distal third to half of their length. Clypeal dorsum with very sparse short anteriorly curved simple ground-pilosity

and with numerous erect to suberect long stout weakly clavate hairs. Anteriorly on the clypeus the stout hairs curve forward from their bases then upwards and usually slightly backwards. Posteriorly on the clypeus is a single transverse row of stout clavate hairs which are much longer than those situated anteriorly and which are vertical, weakly sinuate throughout their length and weakly directed anteriorly at their apices (from the non-paratypic material as the posterior row of clavate hairs is crushed down in the holotype). Dorsum of head behind clypeus only with simple fine pilosity, without the long weakly clavate hairs which are so obvious on the clypeus; the fine hairs simply anteriorly curved and closely applied to the surface in the area behind the clypeus but posterior to that, approaching the vertex and beyond, the hairs are arched, looped or weakly flagellate. With the head in full-face view the sides with projecting simple hairs similar to those on the dorsum, weakly flagellate, arched or looped. Scape feebly bent at its basal third, broadest at about the midlength and the leading edge with a row of projecting simple curved hairs. Maximum diameter of eye $0.16 \times \text{HW}$. Pronotum not marginate laterally, without a median dorsal ridge or carina. With alitrunk in profile the metanotal groove absent, not impressed. Propodeal teeth triangular and acute, subtended by a narrow evenly concave infradental lamella. Dorsal surfaces of pronotum, mesonotum, petiole, postpetiole and gaster with numerous fine simple hairs which are arched, looped or weakly flagellate. Sides of pronotum and propodeum reticulate-rugulose, the pleurae punctate. Promesonotal dorsum densely and strongly rugulose. Propodeal dorsum rugulose and with vestigial punctures. Dorsum of petiole node rugulose, the postpetiole smooth and shining. First gastral tergite unsculptured except for the strong basigastral costulae. Spongiform appendages of pedicel segments strongly developed in profile. In dorsal view the broad posterior strip of the petiole node concave medially. Postpetiole surrounded by spongiform material in dorsal view, the broad posterior strip indented medially. Spongiform material at base of first gastral tergite forming a narrow band which is mostly overlapped by the posterior postpetiolar spongiform tissue, the area of the first tergite immediately behind the spongiform material lamellar and traversed by the basigastral costulae. Colour orange-brown, the gaster blackish brown.

Holotype worker, **Angola**: nr Gubela, 17.iii.1972, forest litter (*P. Hammond*) (BMNH).

Non-paratypic material examined. **Nigeria**: Ibadan (*B. R. Critchley*). **Zaire**: Yangambi (*M. Maldaque*). **Angola**: R. Kahingo (*Mwaoka*).

The non-paratypic material consists of three specimens, one from each locality, which resemble the holotype in all main characters but which show some sculptural variation. With so few specimens available I cannot guess at the significance, or lack of significance, of this variation and so leave all as a single species for the time being. The species is characterised and separated from other members of the group by having a smooth postpetiolar disc, no metanotal groove, and by having specialized long stout clypeal hairs which are absent from the dorsum of the head behind the clypeus where only fine simple hairs are present. Other members of the group having a smooth postpetiole and lacking a metanotal groove (*arahana*, *fenkara*, *placora*, *synkara*, *tolomyia*) all have very obvious specialized hairs on the cephalic dorsum which are similar to or even longer than those on the clypeus.

Smithistruma mekaha sp. n.

HOLOTYPE WORKER. TL 2.6, HL 0.70, HW 0.46, CI 66, ML 0.06, MI 9, SL 0.31, SI 65, PW 0.32, AL 0.71.

Principal dental row of 5 teeth, dentition as described for *kerasma*. Anterior clypeal margin extremely shallowly convex, the anterolateral angles rounded. Lateral margins of clypeus very feebly divergent posteriorly, the preocular lamellae continuing the lines of the clypeal margins in full-face view but slightly convergent posteriorly. Lateral and anterior margins of clypeus with fine simple hairs which are directed forward or forward and upward, the clypeal dorsum with some erect curved fine hairs. Behind the level of the clypeus all hairs on the cephalic dorsum are fine, simple and strongly arched forward so that their apices are in contact with the surface some distance in front of their bases. Lateral margins of head with some freely projecting fine hairs and with curved hairs like those on the dorsum. Upper scrobe margins divergent behind the frontal lobes, the sides of the head behind the level of the scrobes irregularly convex. Occipital margin concave and with a narrow bordering rim or flange. Clypeus irregularly rugose, the sculpture much weaker than on the cephalic dorsum. Dorsum of head coarsely irregularly rugose to coarsely punctate-rugose, the rugae in places surrounding small foveolate punctures from which the hairs arise. Scapes narrow at base, broadening to a maximum at about the midlength then narrowing again to the apex. Leading edges of scapes with fine projecting simple hairs. Pronotum not marginate laterally, without a median longitudinal ridge or carina. Metanotal groove shallowly but conspicuously impressed. In profile the propodeal teeth short and stout, the infradental lamellae very narrow and with concave free margins.

Sides of pronotum, metapleuron and propodeum coarsely irregularly rugose, contrasting strongly with the mesopleuron which is sculptured with fine sharply incised small separate punctures on a smooth surface. Pronotal dorsum very coarsely irregularly longitudinally rugose, the rugae and the small spaces between them smooth. Mesonotum similarly sculptured, propodeum rugose towards the sides but the centre of the dorsum with a few deformed punctures. Dorsal alitrunk with numerous fine simple hairs. Spongiform appendages of pedicel segments massively developed. In profile the ventral spongiform appendage of the petiole forming a lobe anteriorly which is suddenly narrowed at about the level of the ascending face of the node and then broadened again behind, as if a broadly triangular notch had been cut in the ventral margin of the spongiform tissue. Ventral spongiform lobe of postpetiole very large. Petiole node in dorsal view coarsely sculptured, with a thick posterior ruff of spongiform material which is almost as thick at its midlength (its narrowest point) as the dorsum of the node is long, the spongiform material becoming even thicker laterally. Postpetiolar disc unsculptured, smooth and shining, surrounded on all sides by dense spongiform tissue. Anterior margin of postpetiole bounded by a transverse spongiform strip, the sides bounded by projecting spongiform tissue which is narrowest anteriorly. Posterior spongiform strip of postpetiole with its posterior margin very weakly indented medially, the indentation very shallow and not approaching the margin of the disc; with a thick band of spongiform material separating the posteriormost point of the disc from the base of the impression. Base of first gastral tergite with a broad dense spongiform strip which is not traversed by the basigastral costulae; the latter short but strongly defined on the base of the tergite proper. Pilosity of petiole, postpetiole and gaster entirely of fine simple hairs. Colour brown.

PARATYPE WORKER. TL 2.6, HL 0.70, HW 0.47, CI 67, ML 0.07, MI 10, SL 0.31, SI 66, PW 0.33, AL 0.73. As holotype.

Holotype worker, **Cameroun**: nr Yaounde, sample ABH (*G. Terron*) (ENSA).

Paratype. 1 worker with same data as holotype (BMNH).

Among the known species of the *weberi*-complex only 3, *kerasma*, *mekaha* and *weberi*, have the metanotal groove impressed. Of these *weberi* is recognised by the very strong impression in the posterior margin of the spongiform strip bordering the postpetiole posteriorly. This impression is so deep in *weberi* that it reaches to the margin of the postpetiolar disc, whereas in *kerasma* and *mekaha* the impression is shallow and there is always a wide expanse of spongiform material between the posterior margin of the postpetiolar disc and the deepest point of the impression. Other differences from *weberi* are tabulated under *kerasma*. *S. kerasma* and *mekaha* are separated by the form of the cephalic pilosity, which in the former consists of numerous standing hairs which are erect basally but pass through an obtuse angle near their midlengths so that their upper portions are directed forwards. In *mekaha*, on the other hand, all the cephalic hairs are strongly arched forwards from base to apex so that their apices are in contact with the surface some distance in front of their bases.

Smithistruma minkara sp. n.

(Fig. 14)

HOLOTYPE WORKER. TL 2.5, HL 0.73, HW 0.40, CI 55, ML 0.06, MI 8, SL 0.31, SI 78, PW 0.28, AL 0.68.

Head very long and narrow, CI range of entire type-series 54–58; CI range for all other known species of the *weberi*-group is 61–68. Mandibles (from a paratype) armed with a high truncated basal lobe which is slightly longer than any of the teeth in the principal row. Distal to the basal lamella is the principal row of 5 relatively large teeth, separated from the lamella by a small diastema. Following these are two slightly smaller teeth, 4 minute denticles and a small apical tooth. Anterior clypeal margin transverse to exceedingly shallowly convex, the lateral clypeal margins very slightly convergent anteriorly and with broadly rounded anterolateral angles. Sides and dorsum of clypeus with short curved ground-pilosity and also with numerous much longer stouter curved simple hairs. The long stout simple hairs arising from the lateral clypeal margins are directed outwards from the margin but then curve upwards or forward and upwards. On the dorsum of the clypeus the hairs are shorter centrally than at the sides, directed vertically or slightly curved. In profile the dorsum of the head behind the clypeus with short fine anteriorly curved ground-pilosity which is decumbent, and with stouter longer straighter hairs which are vertical or nearly so, these hairs shorter anteriorly than posteriorly on the head. In full-face view the sides of the head with abundant long simple projecting hairs, most of which are curved or sinuate. Median portion of clypeus from anterior tumulus to frontal lobes smooth or nearly so, the rest of the clypeus irregularly punctate. Dorsum of head coarsely reticulate-punctate, with well developed rugulae between the punctures on the

vertex. Occipital concavity bounded on each side by a small flange or tooth in full-face view. Antennal scapes relatively long, narrowest at base but gradually increasing in width through the basal third, then slightly bent and broadened, the evenly curved leading edge with a series of freely projecting curved long simple hairs. Eyes of moderate size, maximum diameter $0.15 \times \text{HW}$. Head flattened in profile, the dorsum depressed and shallowly concave between clypeus and vertex, the eye bulging slightly beyond the ventral margin of the scrobe. Dorsal surfaces of alitrunk (except propodeum), petiole, postpetiole and first gastral tergite with numerous erect irregular to flagellate fine simple hairs, shorter more reclinate forms of which also project from the dorsal (outer) surfaces of the middle and hind tibiae. Dorsum of promesonotum and sides of pronotum strongly longitudinally rugose, the rugae smooth and rounded dorsally but the spaces between them punctate to shagreened and dull. Propodeal dorsum unsculptured except for a few small punctures, the declivity smooth. Pleurae mostly smooth, with a sparse median punctulate patch; the sides of the propodeum irregularly strongly rugose. With the alitrunk in profile the metanotal groove very feebly indicated, the propodeal teeth strong and broadly triangular, without infradental lamellae. Pronotum not sharply marginate laterally and lacking a median dorsal longitudinal carina. Dorsum of petiole node strongly irregularly rugose. Dorsum of postpetiole everywhere very strongly longitudinally costate to rugose, the sculpture very regular and almost sulcate. Basigastral costulae fine and very numerous, extending back almost to the apex of the segment in the centre of the sclerite, less extensive at the sides. Spongiform appendages of pedicel segments massively developed in profile. In dorsal view the petiole node surrounded posterolaterally and posteriorly by a thick spongiform strip. Disc of postpetiole in dorsal view completely surrounded by thick spongiform tissue which is broadest posterolaterally. Base of first gastral tergite with a thick spongiform transverse band which is overlapped by that on the posterior margin of the postpetiole. Colour medium brown.

PARATYPE WORKERS. TL 2.4–2.6, HL 0.70–0.76, HW 0.40–0.44, CI 54–58, ML 0.06–0.08, MI 8–11, SL 0.30–0.33, SI 73–78, PW 0.28–0.29, AL 0.67–0.74 (14 measured).

As holotype but maximum diameter of eye $0.15\text{--}0.18 \times \text{HW}$. In some the pleural punctate area is somewhat more extensive than in others and frequently the mesonotum is rather more swollen in profile than is the case in the holotype. One or two vestigial rugulae may be present on the propodeal dorsum, especially towards the sides. The basigastral costulae may cover only about half of the first gastral tergite on the centre of the sclerite.

Holotype worker, **Ivory Coast**: Monogaga, 24.x.1980 (V. Mahnert & J.-L. Perret) (MHN).

Paratypes. **Ivory Coast**: 11 workers with same data as holotype; 21 workers and 3 females, Tai Forest, 17.x.1980 (V. Mahnert & J.-L. Perret); 1 worker, Sassandra, 10 km from Monogaga, 16.iii.1977 (I. Löbl); 1 worker, Abidjan, Banco Forest, ii.1963 (W. L. Brown) (MHN; BMNH; MCZ; ENSA).

Of the three known species of this group which have the postpetiolar disc sculptured, *minkara* is immediately identifiable by its very long narrow head and relatively long scapes.

Smithistruma nykara sp. n.

HOLOTYPE WORKER. TL 2.4, HL 0.66, HW 0.43, CI 65, ML 0.07, MI 12, SL 0.31, SI 72, PW 0.29, AL 0.63.

Basal lamella of mandible not visible, what can be seen of dentition as described for *enkara*. Anterior clypeal margin transverse, the lateral margins very shallowly convex and feebly convergent anteriorly. Clypeus laterally and dorsally with fine short simple ground-pilosity which is mostly anteriorly curved and quite closely applied to the surface, and also with conspicuous much longer simple stouter hairs which are blunt apically. In profile these long hairs arise almost vertically from the clypeal dorsum, are shorter anteriorly and longest posteriorly where they form a transverse row of 4. In full-face view the long hairs project laterally or anterolaterally from the margins and are upcurved in the apical half to one-third of their length. Sides of head with numerous projecting fine simple hairs which are feebly flagellate, arched or looped. Dorsum of head behind clypeus with short anteriorly curved ground-pilosity such as is seen on the clypeus but towards the vertex and from the vertex to the occipital margin with fine simple hairs which are short flagellate, arched or looped. Long stout hairs such as those described on the clypeus are absent from the cephalic dorsum proper. Dorsum of head reticulate-rugulose, the clypeus less regularly rugulose. Antennal scapes feebly bent at about the basal third, broadest just distal to this. Leading edge of scape with a series of simple long projecting curved hairs. Maximum diameter of eye $0.14 \times \text{HW}$. Pronotum not marginate laterally, without a median longitudinal ridge or carina dorsally. In profile the metanotal groove not impressed, the propodeal teeth broad basally but narrowly triangular at apex, and with a narrow but distinct infradental lamella. Dorsal surfaces of pronotum, mesonotum, petiole, postpetiole and gaster with numerous fine simple hairs which are mostly short flagellate but some of which are curved or looped.

apically. Dorsal (outer) surfaces of middle and hind tibiae with numerous simple projecting hairs, many of which are curved or subflagellate. Sides of pronotum reticulate-rugose, pleurae densely punctate. Dorsal alitrunk everywhere finely but strongly reticulate-rugose, the spaces between the rugae not punctate except posteriorly on the propodeum where they form the main sculpture between the bases of the teeth. Petiole dorsum reticulate-rugose and the anterior face with a narrow transverse crest; the disc of the postpetiole strongly longitudinally rugose. Basigastral costulae strongly developed, covering the basal third or slightly more of the tergite. With pedicel segments in profile the spongiform appendages strongly developed. In dorsal view the petiole node with a narrow posterior strip which is broadest posterolaterally and interrupted medially. Sides of postpetiole disc not bounded by spongiform tissue in dorsal view. Posterior margin of postpetiole with a spongiform strip which is broad posterolaterally but concave and much narrowed medially, and interrupted centrally. Base of first gastral tergite with a transverse strip which is mostly laminar and is traversed by the basal costulae. Colour medium brown.

PARATYPE WORKERS. TL 2.4–2.6, HL 0.65–0.70, HW 0.44–0.47, CI 66–68, ML 0.07, MI 10–12, SL 0.31–0.34, SI 71–73, PW 0.28–0.32, AL 0.62–0.70 (4 measured).

As holotype, the maximum diameter of the eye $0.14\text{--}0.16 \times \text{HW}$.

Holotype worker, **Zimbabwe**: Umtali, Melsetter, 1700 m, ii.1969 (R. Mussard) (MHN).

Paratypes. 4 workers with same data as holotype (MHN; BMNH; MCZ).

Related to *enkara* and *minkara* by its possession of a sculptured postpetiolar disc, *nykara* is separated from the latter by its shorter broader head, punctate pleurae and different cephalic pilosity. From the former *nykara* is differentiated by the characters given in the key and noted under *enkara*.

Smithistruma placora sp. n.

HOLOTYPE WORKER. TL 2.1, HL 0.58, HW 0.39, CI 67, ML 0.04, MI 7, SL 0.28, SI 72, PW 0.27, AL 0.58.

Dentition of mandible (from a paratype) as described for *malaplex*. With the head in full-face view the anterior clypeal margin very shallowly concave. Sides of clypeus irregular and feebly convex, somewhat convergent anteriorly and with rounded anterolateral angles. Lateral margins of clypeus in full-face view with numerous projecting hairs; a lower series of more slender hairs present which are curved anteriorly and are densest on the posterior halves of the margins, the more anteriorly placed members of this series of slender hairs may be upcurved apically. Above these finer hairs is a series of much longer stouter cylindrical hairs which project anterolaterally, are curved upwards or upwards and backward in the apical half to one-third of their length, and which are feebly clavate apically. The anterior clypeal margin with a few pairs of weakly clavate very short hairs which are directed towards the midline. Sides of head in full-face view irregular, with projecting long hairs which are stoutest and most rigid anteriorly on the upper scrobe margins but which become finer and more flexuous posteriorly on the sides and are weakly flagellate on the posterior curves of the occipital lobes. With the head in profile the clypeal dorsum with a shallow median concavity which lacks hairs. In front of this the anterior clypeal convexity is equipped with numerous short stout weakly clavate hairs which are directed anterodorsally from their bases but which are then curved so that their apices point vertically or even posteriorly; the more anteriorly situated members of this group of hairs are shorter than those nearest the median concavity. Behind the median clypeal concavity is a single transverse row of longer sinuate weakly clavate hairs whose apices tend to point weakly forwards. Behind these, at the level of the frontal lobes are similarly constructed but shorter hairs, about half the length of the posterior clypeal row or slightly more. Dorsum of head behind clypeus with fine simple short ground-pilosity which is closely applied to the surface and strongly curved anteriorly, and with numerous very long specialized hairs which are arranged roughly in arched-transverse rows. The anteriormost specialized row contains the stoutest most rigid hairs, which are slightly curved anteriorly and at least twice longer than the longest hairs on the clypeal dorsum. The more posterior rows are no shorter but become progressively finer and more flexuous; those behind the vertex are feebly flagellate. Scape weakly bent at its basal third and broadest just distal to this, the leading edge and dorsal surface with curved simple projecting hairs. Maximum diameter of eye $0.15 \times \text{HW}$. Dorsum of head densely reticulate-rugose. Pronotum not marginate laterally, without a median longitudinal ridge or carina. Alitrunk in profile lacking a metanotal groove or impression. Propodeal teeth narrowly triangular and subtended by a narrow evenly concave infradental lamella. Sides of pronotum and propodeum irregularly rugulose, the pleurae punctate. Promesonotal dorsum longitudinally rugose with weakly punctulate interspaces. Propodeal dorsum densely punctate with only vestiges of fine rugulae, the declivity smooth. Dorsum of petiole node irregularly rugose, the postpetiolar disc smooth and shining. First gastral tergite with dense conspicuous basal costulae. Dorsal

surfaces of pronotum, mesonotum, petiole, postpetiole and gaster with numerous long fine flagellate hairs. Spongiform appendages of pedicel segments massively developed in profile. In dorsal view the petiole node with a broad posterior spongiform strip which is concave posteromedially. Postpetiole disc completely surrounded by spongiform material, the margin of the posterior spongiform strip sharply indented medially. Spongiform band traversing base of first gastral tergite thick and ruff-like. Colour medium brown, the gaster blackish brown.

PARATYPE WORKERS. TL 2.0–2.1, HL 0.56–0.60, HW 0.36–0.38, CI 63–66, ML 0.04–0.05, MI 7–9, SL 0.24–0.28, SI 68–74, PW 0.24–0.27, AL 0.52–0.58 (3 measured).

As holotype but maximum diameter of eye 0.14–0.16×HW.

Holotype worker, **Cameroun**: Nkoemvon, 2.xi.1980, N49 (*D. Jackson*) (BMNH).

Paratypes. **Cameroun**: 2 workers with same data as holotype but 2.iii.1980; 1 worker with same data but 12.x.1980, N45 (BMNH; MCZ; MHN).

Among the species of the *weberi*-complex of this group, as characterized by their unsculptured postpetiolar discs, *placora* is isolated by its remarkable cephalic pilosity and lack of an impressed metanotal groove. The closest relatives of *placora*, *fenkara*, *tolomyia* and *synkara*, are discussed under the last name.

Smithistruma synkara sp. n.

HOLOTYPE WORKER. TL 2.7, HL 0.76, HW 0.50, CI 66, ML 0.07, MI 9, SL 0.34, SI 68, PW 0.34, AL 0.74.

Dentition of mandible not clearly visible but apparently as described for *malaplastax*. Anterior clypeal margin transverse to feebly sinuate. Sides of clypeus irregular, slightly convergent anteriorly and with rounded anterolateral angles. In full-face view the posterior halves of the sides of the clypeus with a few simple projecting anteriorly curved fine hairs which are acute apically. Above and forward of these fine hairs are a number of much longer stouter cylindrical hairs which are blunt apically and which project anterolaterally, being sharply upcurved in the apical half to one-third of their length. Anterior clypeal margin with a few much shorter straight hairs which project forward over the mandibles. Sides of head behind clypeus irregular and with numerous projecting fine hairs, the posteriormost of which are weakly flagellate. In profile the clypeal and cephalic dorsa with short fine ground-pilosity which is curved anteriorly and closely applied to the surface, and with long specialized hairs which are stout and simple and pointed to blunt apically, but not clavate. On the anterior portion of the clypeus the specialized hairs are relatively short and curve forwards and upwards. Behind them is a shallowly concave area of the clypeus which lacks hairs and behind this is a transverse row of long erect feebly sinuate hairs which are two or more times longer than those on the anterior part of the clypeal dorsum. From this level to the vertex all the specialized long hairs are stout and simple, acute apically and slightly curved forward, all about the same length, roughly equal to the longest hairs on the clypeal dorsum except for those which are adjacent to the frontal lobes, which are slightly shorter. Behind the vertex the hairs shorter and more strongly curved, those closest to the occipital margin finer and weakly flagellate. Entire dorsum of head strongly reticulate-rugulose. Scapes weakly bent at about the basal third, broadest distal to this and the leading edge and dorsal surface with long projecting cylindrical curved hairs. Maximum diameter of eye 0.16×HW. Pronotum not marginate laterally, lacking a median longitudinal ridge or carina dorsally. In profile the alitrunk lacking a metanotal groove or impression, with narrow sharply triangular propodeal teeth subtended by a slender infradental lamella whose free posterior margin is concave. Sides of pronotum and propodeum irregularly rugose, the pleurae punctate. Pronotal dorsum longitudinally rugose with a few cross-meshes; mesonotal dorsum strongly reticulate-rugose. Propodeal dorsum predominantly punctate, with faint regular vestiges. Dorsum of petiole node strongly rugose, the postpetiolar disc smooth and shining. First gastral tergite smooth and shining except for the dense sharply defined basal costulae. Dorsal surfaces of pronotum, mesonotum, petiole, postpetiole and gaster with fine dense hairs which are arched, looped or flagellate. Spongiform appendages of pedicel segments strongly developed in profile. In dorsal view the petiole node with a thick posterior spongiform strip which is narrowest medially. Disc of postpetiole completely surrounded by thick spongiform material, the posterior band deeply indented medially. Base of first gastral tergite with a thick ruff-like transverse spongiform band. Colour dark brown, the gaster blackish brown.

PARATYPE WORKER. TL 2.8, HL 0.76, HW 0.50, CI 66, ML 0.07, MI 9, SL 0.34, SI 68, PW 0.34, AL 0.72

As holotype.

Holotype worker, **Gabon**: Makokou, x.1972, rain forest (*I. Lieberburg*) (MCZ).

Paratype. 1 worker with same data as holotype (BMNH).

Within the *weberi*-complex four species, *fenkara*, *placora*, *tolomya* and *synkara* form a close association by their mutual lack of postpetiolar sculpture, lack of a metanotal impression and possession of long specialized hairs on the cephalic dorsum which are similar to those on the clypeal dorsum. In *fenkara*, *tolomya* and *synkara* these specialized cephalic hairs tend to be about equal in size and shape and equal to the longest hairs on the clypeal dorsum, whereas in *placora* the size and shape of the specialized hairs are very variable, and those on the cephalic dorsum tend to be very much longer than any found on the clypeus. *S. fenkara* is a smaller more lightly coloured species than *synkara* and has the long cephalic hairs conspicuously clavate (simple in *synkara*). Finally *tolomya*, a smaller species, has a deep median indentation in the spongiform strip bordering the posterior margin of the postpetiole and has the anterior clypeal margin shallowly but evenly concave.

***Smithistruma tolomya* sp. n.**

HOLOTYPE WORKER. TL 2·1, HL 0·58, HW 0·39, CI 67, ML 0·06, MI 10, SL 0·27, SI 69, PW 0·27, AL 0·60.

Dentition (from paratype) of a high basal lamella followed by a small diastema, 5 relatively large teeth forming the principal row, two slightly smaller teeth, 4 minute denticles and a small apical tooth. Anterior clypeal margin evenly shallowly concave, the anterolateral angles rounded and the sides very feebly divergent posteriorly. Lateral margins of clypeus with projecting simple hairs, the shorter hairs curved anteriorly, the longer hairs projecting outwards and upcurved in their apical halves. Sides of head with numerous long fine projecting hairs. In profile the clypeal dorsum with a few upcurved hairs anteriorly and a transverse row of much longer erect sinuate hairs across the posterior clypeal margin. Ground-pilosity of cephalic dorsum behind clypeus of short fine anteriorly arched hairs whose apices are in contact or nearly in contact with the surface. Specialized pilosity of erect curved to sinuate hairs similar to those on the posterior clypeus are present on the cephalic dorsum, the longest of them no longer than those on the posterior clypeus or only very slightly longer. Scape slightly bent in basal third, the leading edge with a series of freely projecting simple hairs which are upcurved apically. Cephalic dorsum densely and coarsely reticulate-rugose, the clypeus more finely sculptured. Pronotum not marginate laterally, without a median longitudinal carina dorsally. Metanotal groove absent. Propodeal teeth fine and narrow, the infradental lamella reduced to a mere carina which follows the concavity of the declivity. Sides of pronotum and propodeum reticulate-rugose, the mesopleuron with scattered small sharply incised punctures on a smooth surface, the metapleuron mostly smooth. Promesonotal dorsum coarsely rugose, the propodeal dorsum densely punctate. Spongiform appendages of pedicel segments well developed in profile. Ventral appendage of petiole with a broad indentation in its ventral margin at about the midlength. Ventral lobe of postpetiole massive. Petiole node rugulose in dorsal view, the posterior spongiform strip narrow medially, its thickness distinctly much less than the dorsal length of the node. Postpetiole in dorsal view smooth and shining, surrounded on all sides by spongiform material. Anteriorly the postpetiole with a relatively narrow transverse spongiform strip, laterally the spongiform material increasing thickness posteriorly, the tissue thickest at the posterolateral angles. Margin of posterior spongiform appendage of postpetiole indented medially, the indentation reaching the posterior margin of the disc. Base of first gastral tergite with a dense spongiform strip, the tergite behind this level with short basigastral costulae present. Dorsal surfaces of alitrunk, petiole, postpetiole and gaster with numerous simple fine hairs. Colour brown.

PARATYPE WORKER. TL 2·1, HL 0·58, HW 0·38, CI 66, ML 0·05, MI 9, SL 0·26, SI 68, PW 0·26, AL 0·58. As holotype.

Holotype worker, **Cameroun**: nr Yaounde, sample K2 (*G. Terron*) (ENSA).

Paratype. 1 worker, **Cameroun**: nr Yaounde, sample FF (*G. Terron*) (BMNH).

In the *weberi*-group six species are known in which the postpetiolar disc is without costulate sculpture and the metanotal groove is not impressed. These two characters are combined in *arahana*, *fenkara*, *malaplax*, *placora*, *synkara* and *tolomya*. The first named is easily distinguished from the rest as it has the spongiform trip which borders the petiole node posteriorly very thick indeed, thicker than the dorsal length of the node. In the remainder this strip is quite narrow, not even approaching the length of the node. Two other species which are quickly differentiated from *tolomya*; *malaplax*, which lacks specialized long hairs on the cephalic dorsum similar to those on the clypeal dorsum, and *placora*, in which such specialized hairs are present but very much longer on the cephalic dorsum than on the clypeus. The remaining species, *fenkara*, *synkara* and *tolomya*, form a close triad. *S. fenkara* is characterized by the

conspicuously swollen nature of the specialized cephalic hairs and *synkara* is differentiated from *tolomyia* by the characters mentioned in the key and the shape of the anterior clypeal margin, which is concave in the latter species.

Smithistruma weberi Brown

Smithistruma weberi Brown, 1959c: 7, fig. 4. Holotype worker, ZAIRE: Ango, ii.-iii.1948, no 2170 (*N. A. Weber*) (MCZ) [examined].

WORKER. TL 2.3, HL 0.61, HW 0.39, CI 64, ML 0.07, MI 11, SL 0.28, SI 72, PW 0.28, AL 0.58.

Basal lamella of mandible a high truncated rectangle with concave sides. Basalmost tooth on mandible small, separated from the basal lamella by a small diastema. Second tooth from base the longest, the third about twice longer than the basalmost. The three teeth of the principal row following the second (longest) tooth are about the same size and are followed distally by 2 smaller teeth, 4 minute denticles and a small apical tooth. Anterior clypeal margin more or less transverse, only very feebly sinuate. Lateral clypeal margins irregular, feebly convergent anteriorly and with rounded anterolateral corners. With the head in full-face view the lateral clypeal margins with a few anteriorly curved simple short hairs and with a number of anterolaterally or laterally projecting stout long hairs which are upcurved in their apical halves and feebly clavate apically. Such hairs also present on clypeal dorsum where they curve posteromedially, and on the sides of the head where they curve upwards and forwards. Dorsum of head behind clypeus with small simple anteriorly curved hairs which are closely applied to the surface and with longer stout hairs similar in shape and size to those on the clypeus, the longer subclavate hairs feebly curved anteriorly or anteromedially. Cephalic dorsum strongly densely reticulate-rugulose. Antennal scape weakly bent in its basal third, broadest at about the midlength and having the leading edge equipped with freely projecting curved hairs which also occur on its dorsal surface. Maximum diameter of eye $0.18 \times \text{HW}$. Pronotum not marginate laterally and without a median longitudinal ridge or carina dorsally. With the alitrunk in profile the metanotal groove distinctly impressed. Propodeal teeth very small and triangular, subtended by a conspicuous infradental lamella whose free posterior margin is almost straight, not evenly concave as is usual in this group. Dorsal surfaces of pronotum, mesonotum, petiole, postpetiole and gaster with numerous simple fine hairs which may be subflagellate, looped or arched, without large subclavate hairs similar to those on the head. Sides of pronotum and propodeum rugulose, the mesopleuron finely punctate and the metapleuron almost smooth. Dorsum of pronotum and mesonotum densely reticulate-rugulose, the propodeal dorsum densely punctate and the declivity smooth. Petiole dorsum irregularly rugulose; postpetiolar disc smooth. First gastral tergite with sharply defined but short basal costulae. Spongiform appendages of pedicel segments strongly developed in profile. In dorsal view the petiole node with a broad posterior spongiform strip whose free margin is shallowly concave medially. Disc of postpetiole surrounded by spongiform material, the strip bordering the posterior margin broadest posterolaterally, narrowing medially and sharply indented at the midpoint, the indentation reaching the margin of the disc itself. Base of first gastral tergite with a broad band of spongiform material from which the basigastral costulae emerge. Colour medium brown.

Known only from the holotype *weberi* is one of three species in the group which combine an unsculptured postpetiolar disc and an impressed metanotal groove. The other species showing these two characters together are *kerasma* and *mekaha*; details for separating these two from *weberi* are tabulated under *kerasma*.

MATERIAL EXAMINED

Zaire: Ango (*N. A. Weber*).

The *marginata*-group

(Fig. 17)

Antennae with 4 or 6 segments. Basal lamella of mandible a long low lobe followed by a principal dental row of 7 teeth, without a diastema. Anterior clypeal margin broadly and shallowly convex in full-face view and the sides of the clypeus roughly parallel, not convergent anteriorly throughout their length. Lateral and anterior margins of clypeus, and clypeal dorsum, lacking hairs of any description. Body hairs sparse, fine and simple. Long flagellate hairs present on dorsal margins of the antennal scrobes and on the pronotal humeri. Leading edges of scapes without projecting hairs, any hairs which do occur here are minute and decumbent to appressed. Pronotum not marginate laterally in *rusta* but sharply marginate in *marginata*, both with a median longitudinal carina on the pronotal dorsum. Infradental lamellae on propodeum broad.

Of the two species recognized in this small group *rusta*, known only from Zimbabwe, has 6 antennal segments and lacks lateral pronotal margination, whilst the more widely distributed *marginata*, from Ivory Coast, Kenya and Zimbabwe, has only 4 antennal segments and possesses strong lateral pronotal margination. Despite these marked differences I regard both species as belonging in the same group as they have the same very characteristic clypeal structure, head shape, body pilosity and distribution of flagellate hairs.

S. marginata was previously included in the now disbanded genus *Miccostruma*, as discussed in the introduction to the genus.

***Smithistruma marginata* (Santschi) comb. n.**

Epitritus marginatus Santschi, 1914a: 114, fig. 21. Syntype workers, KENYA: Shimoni, st. no. 9, xi. 1911 (*Ch. Alluaud & R. Jeannel*) (NMB) [examined].

Miccostruma marginata (Santschi) Brown, 1948: 123.

WORKER. TL 1.2–1.3, HL 0.40–0.43, HW 0.26–0.28, CI 64–68, ML 0.04, MI 8–10, SL 0.17–0.18, SI 64–67, PW 0.16–0.18, AL 0.37–0.39 (10 measured).

Mandible with a low basal lamella, not a high triangle or high rectangle with concave sides, the lamella not or just visible when the mandibles are closed. No diastema between basal lamella of mandible and basalmost tooth. Principal dental row consisting of 7 teeth, followed by 4 minute denticles and a small apical tooth. In full-face view the outer margins of the fully closed mandibles diverging posteriorly but intersecting the shallowly convex anterior margin of the clypeus well in from the rounded anterolateral angles; the outer margins of the mandibles and the lateral clypeal margins not forming a more or less continuous line. Clypeus absolutely devoid of hairs, without fringing pilosity and lacking dorsal pilosity. Lateral margins of clypeus straight and parallel, rounding anteriorly into the shallowly convex anterior margin, continuous posteriorly with the parallel preocular laminae. Disc of clypeus without a tumulus, with scattered minute pubescence visible under high magnification and with its posteriormost portion slightly raised into a low blunt prominence between the frontal lobes. Upper scrobe margins in full-face view evenly curved-divergent behind the frontal lobes, with a maximum of three laterally projecting flagellate hairs on each side, though these seem to be lost easily by abrasion. Dorsum of head with very fine sparse simple curved short ground-pilosity and with two pairs of long curved to flagellate hairs. Dorsum of clypeus finely shagreened or granular, dorsum of head finely reticulate-punctate. Antennae with 4 segments, the scapes curved in the basal third, not dorsoventrally flattened beyond the curve; their leading edges with fine apically curved simple hairs which are decumbent to appressed. Eyes small, their maximum diameter only about $0.07 \times \text{HW}$ and distinctly less than the maximum width of the scape. Pronotum sharply marginate anteriorly and laterally and with a strong mid-dorsal longitudinal ridge or carina which may be doubled for part or most of its length. Mesonotum laterally less strongly marginate than pronotum but propodeum sharply marginate to the base of the teeth. Mesonotal dorsum usually with a continuation of the pronotal median carina but this may be poorly developed or faint in some individuals. The dorsal alitrunk with a transverse crest or slightly raised step between the mesonotum and propodeum. Dorsal alitrunk with scattered sparse ground-pilosity which is short fine and decumbent, and with three pairs of flagellate hairs distributed as follows. First pair on pronotal humeri, directed dorsolaterally; second pair at approximate midlength of lateral pronotal margination, directed dorsally; third pair on mesonotal margin posteriorly, close to the transverse crest, directed dorsally. Propodeal teeth laminar and continuous with the broad infradental lamellae which run the length of the declivity on each side. Sides of alitrunk unsculptured. Pronotal dorsum mostly smooth but in some with the faintest vestiges of patchy superficial sculpture. Mesonotum posteriorly with faint vestiges of reticular sculpture; propodeum smooth. Spongiform appendages of petiole and postpetiole strongly developed and very voluminous in profile, but in dorsal view only the posterior margin of each segment bounded by spongiform tissue and on the postpetiole the transverse spongiform material is interrupted posteromedially. Disc of postpetiole unsculptured, its posterior margin slightly indented medially. Both pedicel segments with fine curved hairs, some of which are long and subflagellate. First gastral tergite with 5 or 6 basigastral costulae on each side of the midline, otherwise the gaster unsculptured. Gastral pilosity simple and sparse, consisting of scattered fine short hairs which are decumbent to appressed and even sparser suberect to erect fine hairs which are longer. Legs with appressed pubescence only, without standing hairs. Colour uniform dull yellow to yellowish brown.

One of the few *Smithistruma* species to have 4-segmented antennae, *marginata* is separated from all others with this antennomere count by the shape of its clypeus and lack of clypeal pilosity, by

its strongly marginate pronotum and possession of a median longitudinal ridge or carina on the pronotal dorsum.

MATERIAL EXAMINED

Ivory Coast: Man (V. Mahnert & J.-L. Perret); Adiopodoume (V. Mahnert & J.-L. Perret). **Kenya:** Shimoni (Ch. Alluaud & R. Jeannel); Lamu, nr Witu (V. Mahnert & J.-L. Perret). **Zimbabwe:** Umtali, Melsetter (R. Mussard).

Smithistruma rusta sp. n.

(Fig. 17)

HOLOTYPE WORKER. TL 2.0, HL 0.55, HW 0.37, CI 67, ML 0.07, MI 13, SL 0.27, SI 73, PW 0.24, AL 0.52.

Mandible with a principal dental row of 7 teeth of approximately the same size, followed distally by 4 minute denticles and a small apical tooth. Basal lamella of mandible concealed by clypeus. Anterior clypeal margin evenly broadly shallowly convex, the lateral margins more or less straight and parallel, not evenly convergent anteriorly throughout their length. Outer margins of closed mandibles in full-face view intersecting the anterior clypeal margin some distance in from the anterolateral angles, the outer mandibular margins and lateral clypeal margins not forming a more or less continuous line. Anterior and lateral clypeal margins without projecting hairs of any description, dorsum of clypeus without hairs. Dorsum of head behind clypeus with scattered simple fine hairs which are arched and decumbent, or appressed. Sides of head with long flagellate hairs present. Each member of the type-series has lost some flagellate hairs, which seem easily displaced by abrasion; the maximum number of flagellate cephalic hairs appears to be as follows. One pair posterolaterally on the occipital lobes which may be directed upwards or outwards; one pair directed laterally from the posteriormost point of the upper scrobe margins; one pair arising from the side of the head just above the last-mentioned pair and tending to be directed upwards rather than outwards; one pair more anteriorly situated on the upper scrobe margin, about on a level with the anterior margin of the eye. Preocular laminae in full-face view more or less parallel. Antennae with 6 segments, the scape narrow and not strongly flattened, bent approximately at its basal third. Leading edge of scape lacking a series of anteriorly projecting hairs, only with short decumbent to appressed fine pubescence. Maximum diameter of eye $0.11 \times HW$. Dorsum of clypeus closely punctulate, cephalic dorsum strongly reticulate-punctate everywhere except for a narrowly triangular smooth area running back from the posterior clypeal margin between the frontal lobes. Anterior border of pronotum sharply transversely marginate, the sides of the pronotum not marginate. Pronotal and mesonotal dorsa with a median longitudinal ridge or carina. Posterior half of mesonotum and all of propodeum narrowly marginate laterally. With alitrunk in profile the lateral mesonotal-propodeal margination continuous, without trace of a metanotal groove; however, mid-dorsally the median mesonotal ridge or carina ends at a distinct step-down at its junction with the propodeum. Propodeal teeth broadly triangular and with a conspicuous infradental lamella. Pronotal humeri each with a long fine flagellate hair. Dorsal alitrunk with 2-3 pairs of long fine curved hairs which are simple and erect, and with several pairs of decumbent to appressed fine simple short hairs. Dorsal surfaces of petiole and postpetiole with sparse but conspicuous erect to suberect fine hairs. Sides of alitrunk smooth and shining, with marginal feeble sculpture dorsal to and posterior to the extensive smooth area. Pronotal dorsum with 2-3 feeble longitudinal costulae on each side of the median ridge or carina, the spaces between the costulae filled with broad shallow superficial punctures. Mesonotum, propodeal dorsum, propodeal declivity between the teeth and petiole node densely punctate. Disc of postpetiole glassy smooth. First gastral tergite unsculptured except for the sparse widely spaced basigastral costulae. Spongiform appendages of pedicel segments strongly developed in profile. Petiole node in dorsal view with a narrow posterior lamina. Postpetiole in dorsal view with a narrow lamina on the anterior margin and with the lateral spongiform material visible projecting beyond the lateral margins of the disc. Posterior margin of postpetiole with a laminar rather than spongiform transverse strip; broadest laterally and narrowing medially where the posterior margin of the postpetiolar disc itself is indented. Base of first gastral tergite with a narrow laminar strip which is traversed by the sparse basigastral costulae. Colour glossy light brown.

PARATYPE WORKERS. TL 2.0-2.1, HL 0.54-0.58, HW 0.36-0.38, CI 63-69, ML 0.07-0.08, MI 12-14, SL 0.26-0.28, SI 70-78, PW 0.24-0.26, AL 0.52-0.56 (10 measured). As holotype.

Holotype worker, **Zimbabwe:** Umtali, Melsetter, 1700 m, ii.1969 (R. Mussard) (MHN).

Paratypes. 10 workers with same data as holotype (MHN; BMNH; MCZ; ENSA).

Related to *marginata* by the characters discussed in the species-group diagnosis, *rusta* is quickly

separated from all other Afrotropical *Smithistruma* presently known by its combination of these characters with 6-segmented antennae.

The *oxysma*-group

(Figs 18, 19)

Antennae with 6 segments. Basal lamella of mandible a low lobe, principle dental row of 7 teeth; no diastema between the basal lamella and the basalmost tooth. Sculpture of head and body fine. Anterior clypeal margin prominent and narrowly rounded in full-face view, the sides more or less evenly convergent anteriorly and forming an approximately continuous line with the outer margins of the closed mandibles. Sides of clypeus without a fringing row of spatulate or spoon-shaped anteriorly curved hairs. Dorsum of clypeus with weakly clavate hairs which are curved posteriorly or posteromedially, the anteriormost one or two pairs of these being visible in full-face view as they project beyond the clypeal margin, close to the point where the clypeus overlaps the mandibles, and curve outwards and backwards. Body pilosity sparse, fine and simple. Long flagellate hairs present on pronotal humeri, present or absent on upper scrobe margins. Leading edges of antennal scapes without projecting hairs, any hairs which do occur here are short and decumbent to appressed. Pronotum not marginate laterally but with a median dorsal longitudinal carina present. Propodeal infradental lamellae broad and well developed.

The two species of this small group, *anarta* and *oxysma*, are presently known only from South Africa. They are characterized primarily by the form and pilosity of the clypeus, characters not shared with any other Afrotropical species, although the shape is duplicated in the *tacta*-group. In this last-named group, however, the clypeal pilosity is radically different and the antennae have only 4 segments.

The closest relatives of the *oxysma*-group appear to belong to the New World *ornata*-group, which contains three species showing the clypeal shape and pilosity noted above (Brown, 1953a: 64), but in *ornata* and its relatives the mandibles have a long diastema between the basal lamella and the basalmost tooth, a character not observed in the *oxysma*-group. At present I am uncertain how important this character is, so I feel it is best to keep the New World and Afrotropical species in separate groups until it can be investigated in more detail.

Smithistruma anarta sp. n.

(Fig. 18)

HOLOTYPE WORKER. TL 1.9, HL 0.54, HW 0.34, CI 63, ML 0.06, MI 11, SL 0.27, SI 79, PW 0.21, AL 0.48.

Principal dental row of mandible with 7 teeth, followed by 4 minute denticles and a small apical tooth. Basal lamella of mandible (concealed by clypeus in holotype) a long low rounded lobe which is only as high as the basalmost tooth; no diastema between basal lamella and basalmost tooth. In full-face view the clypeus with shallowly convex sides which are evenly convergent anteriorly and with a strongly convex anterior margin which is narrowly rounded medially; the anterior margin on each side of the midpoint forms a single evenly convex line which is continuous with the lateral margins, without trace of an anterolateral angle. Outer margins of the fully closed mandibles forming a more or less continuous line with the outer margins of the clypeus in full-face view. Clypeal margins without a fringe of anteriorly or medially curved large spatulate hairs but one or two simple short hairs may occur posterolaterally. The dorsum of the clypeus along the anterior margin with 3 pairs of short recurved spatulate hairs which curve upwards and backwards from the clypeal edge. Behind this anterior row the clypeal dorsum with 12 similar curved hairs. These 12 make up four pairs which are situated on each side of the midline and which curve backwards and towards the midline, the posteriormost pair being at the posteromedian clypeal apex; a pair on the posterior clypeal margin immediately in front of the anteriormost part of the frontal lobes, curved in the direction of the clypeal margin; and a pair situated posterolaterally on the clypeus, curved towards the midline and slightly backwards. Cephalic dorsum behind clypeus with subdecumbent to decumbent short narrowly spatulate hairs which are curved towards the highest point of the vertex. Flagellate hairs absent from dorsum of head and from upper scrobe margins. Antennal scapes slender, not flattened, narrowed basally and bent at about the basal quarter. Leading edges of scapes without a freely projecting row of long hairs, only with short fine pubescence which is decumbent to appressed. Maximum diameter of eye 0.12×HW. Clypeus finely punctulate, cephalic dorsum reticulate-punctate. Anterior pronotal border sharply transversely marginate. Sides of pronotum not marginate but sides of mesonotum and propodeum angulate. Pronotum with a median longitudinal ridge or carina dorsally. Metanotal groove visible on the

dorsal alitrunk but not impressed in profile. Propodeal teeth short and confluent with the broad infradental lamellae. Pronotal humeri each with a long flagellate hair. Posterodorsally on the mesonotum is a pair of somewhat flattened hairs which are markedly curved towards the midline and are notched apically. Dorsal ground-pilosity of alitrunk consists of a very few decumbent to appressed scattered short hairs, most easily visible on the anterior half of the pronotum. Dorsal surfaces of petiole and postpetiole with numerous back-curved hairs. First gastral tergite with 4 standing hairs only, which are blunted or notched apically and arranged in a transverse row close to the base of the sclerite. Behind this are sparse flattened short appressed hairs on the remainder of the tergite which are directed towards the midline. Sides of alitrunk unsculptured. Dorsal alitrunk unsculptured apart from the median carina and some extremely faint, almost effaced, sculptural vestiges on the promesonotum. Dorsum of petiole node densely punctate, postpetiolar disc glassy smooth. First gastral tergite unsculptured except for the sparse basal costulae which are arranged on each side of a central clear area. Spongiform appendages of pedicel segments strongly developed in profile. In dorsal view the petiole node bounded posteriorly by a narrow lamellar strip. Shallowly concave anterior margin of postpetiole with a narrow lamellar strip. Ventrolateral spongiform appendages of postpetiole not visible in dorsal view. Posterior margin of postpetiole with a lamellar strip and the margin of the disc indented medially. Basal border of first gastral tergite with a sinuate lamella whose free margin is concave medially and convex towards the sides. Colour dull glossy yellow.

PARATYPE WORKER. TL 1.9, HL 0.55, HW 0.36, CI 65, ML 0.06, MI 11, SL 0.28, SI 78, PW 0.22, AL 0.50. As holotype.

Holotype worker, **South Africa**: Natal, Dukuduku Forest Res., 12–15 km E. of Mtubatuba, coast vine forest on sand, 26.1.1977 (W. L. & D. W. Brown) (MCZ).

Paratype. 1 worker with same data as holotype (BMNH).

To the present only two species of this group are known. They are separated easily as in *anarta* the clypeal dorsum has 18 recurved hairs, the upper scrobe margins lack flagellate hairs, the cephalic dorsum lacks flagellate hairs, and the first gastral tergite has only 4 standing hairs arranged in a transverse row close to the base of the sclerite. In contrast *oxysma* has 12 recurved hairs on the clypeal dorsum, has 3 pairs of flagellate hairs on the upper scrobe margins, has flagellate hairs present on the cephalic dorsum, and has 12 or more standing hairs on the first gastral tergite which are distributed all over the sclerite.

Smithistruma oxysma sp. n.

(Fig. 19)

HOLOTYPE WORKER. TL 2.1, HL 0.58, HW 0.36, CI 62, ML 0.07, MI 12, SL 0.27, SI 75, PW 0.22, AL 0.54.

Principal dental row of mandible with 7 teeth followed by 4 minute denticles and a small apical tooth. Basal lamella of mandible (concealed by clypeus in holotype) a long low rounded lobe which is only as high as the basalmost tooth; without a diastema between the basal lamella and the basalmost tooth. In full-face view the clypeus with shallowly convex sides which are evenly convergent anteriorly and with a strongly convex anterior margin which is narrowly rounded medially; the anterior margin on each side of the midpoint forms a single evenly convex line which is continuous with the lateral margins, without trace of anterolateral angles. Outer margins of the fully closed mandibles forming a more or less continuous line with the outer margins of the clypeus in full-face view. Clypeal margins without a fringe of curved spatulate to spoon-shaped hairs but one or two simple short hairs may occur laterally. The dorsum of the clypeus along the anterior margin with three pairs of flattened, apically gradually clavate, recurved hairs. The innermost pair arises very close to the clypeal apex and curves up and back without breaking the clypeal outline. The two outer pairs curve outwards as well as upwards and back and project beyond the clypeal outline in full-face view. Dorsum of clypeus behind the anterior margin also with 6 hairs which are similar in shape to those just described, arranged in a transverse band of 4 behind the midlength which curve backwards and towards the midline, and a pair close to the posterior clypeal margin which are strongly arched towards the midline and only feebly curved backwards. Ground-pilosity of cephalic dorsum of numerous simple to very narrowly spatulate fine hairs which are subdecumbent to decumbent and generally curved towards the highest point of the vertex. Upper scrobe margins with three pairs of flagellate hairs; the posterior occipital lobes with a pair of flagellate hairs; 4 other pairs of flagellate hairs present on the dorsum of the head, making a total of 16 cephalic flagellate hairs. Antennal scapes slender and more or less cylindrical, slightly narrowed basally and very weakly bent at the basal quarter. Leading edges of scapes without strong freely projecting hairs, only with decumbent fine pubescence. Maximum

diameter of eye $0.11 \times \text{HW}$. Clypeal dorsum very finely punctate-granular, the cephalic dorsum strongly reticulate-punctate. Anterior border of pronotum transversely marginate; sides of pronotum not marginate but sides of mesonotum and propodeum angular. A mid-dorsal longitudinal ridge or carina present on pronotum and mesonotum, absent from propodeal dorsum. With the alitrunk in profile the metanotal groove absent and the propodeal teeth confluent with the broad and conspicuous infradental lamellae. Pronotal humeri with a pair of long flagellate hairs which are directed predominantly laterally. Pronotal dorsum behind the humeri with a pair of shorter flagellate hairs and with 2–3 pairs of anteriorly situated fine decumbent shorter hairs. Mesonotal dorsum with two pairs of fine hairs. Fine simple hairs numerous on dorsal surfaces of petiole and postpetiole, and such hairs widely distributed on the first gastral tergite where 12 or more are present. Sides of alitrunk unsculptured except for a few feeble longitudinal striae close to the anterior pronotal margination. Pronotum and mesonotum dorsally with scattered weak longitudinal rugulae or costulae most of which are short, the spaces between them mostly smooth on the pronotum but on the mesonotum with vestiges of punctate sculpture also visible. Propodeal dorsum smooth, with two weak rugulae running from the apex of the median mesonotal ridge across the dorsum to the bases of the propodeal teeth. Dorsum of petiole node densely punctate; disc of postpetiole smooth and shining. First gastral tergite unsculptured except for the basigastral costulae which arise in two patches, on each side of a median clear area. Spongiform appendages of pedicel segments strongly developed in profile. In dorsal view the petiole node bounded posteriorly by a narrow lamellate strip. Postpetiole in dorsal view with the anterior margin sharply concave medially and with a short narrow transverse lamella bordering the concave section. The ventrolaterally situated spongiform appendages of the postpetiole are visible in dorsal view, projecting anterolaterally and laterally beyond the outline of the disc. Posterior margin of postpetiole bordered by a lamellate strip which is very broad posterolaterally. First gastral tergite with a sinuous basal lamellar strip which has its anterior free border convex at the sides and concave medially, and which is traversed by the basigastral costulae. Colour glossy medium brown.

PARATYPE WORKERS. TL 1.9–2.1, HL 0.50–0.58, HW 0.32–0.38, CI 62–67, ML 0.06–0.08, MI 11–14, SL 0.25–0.30, SI 72–80, PW 0.21–0.26, AL 0.50–0.56 (15 measured).

Maximum diameter of eye $0.11\text{--}0.14 \times \text{HW}$. Mostly as holotype but propodeal dorsum may be unsculptured and the mesonotum may lack any trace of punctate sculpture. The long recurved hairs on the clypeus appear to be easily lost by abrasion, especially those of the anterior row, and the long flagellate hairs of the head may be flattened to the surface by accident of preservation.

Holotype worker, **South Africa**: Natal, 75 km WSW. Estcourt, Cathedral Peaks Forest Sta., 7–31.xii.1979, Ber. 8, 17.xii.1979, podocarp forest rotted stump of *Cussonia spicata* (S. & J. Peck) (MCZ).

Paratypes. **South Africa**: 8 workers and 1 female with same data as holotype; 5 workers with same data but Ber. 19, 24.xii.1979, podocarp forest rotted wood, moss, fleshy and woody fungi, 1500 m; 2 workers with same data but Ber. 18, 24.xii.1979, podocarp forest rotted fruit bait 1500 m (MCZ; BMNH; MHN).

Non-paratypic material examined. **South Africa**: Natal, Pietermaritzburg (W. L. & D. E. Brown). **Lesotho**: Mamathes (*C. Jacot-Guillarmod*).

The only closely related species is *anarta*; details of their separation are given under that name.

The *tacta*-group

(Fig. 20)

Antennae with 4 segments, the second funicular long and obviously a fusion segment. Basal lamella of mandible a low lobe, the principal dental row of 7 teeth, without a diastema between the basal lamella and the basalmost tooth. Sculpture of head and body fine. Anterior clypeal margin prominent and narrowly rounded in full-face view, the sides more or less evenly convergent anteriorly and forming an approximately continuous line with the outer margins of the closed mandibles. Margins and dorsum of clypeus with dense fine simple short hairs, without specialized or bizarre pilosity. Body pilosity fine and simple. Long flagellate hairs present on pronotal humeri and upper scrobe margins. Leading edges of scapes without projecting stout hairs. Pronotum dorsally with a median longitudinal carina. Propodeal infradental lamellae present.

The two species in this group, *tacta* and *vodensa* from West and central Africa, may be derived from the *oxysma*-group. The clypeal structure is strikingly similar in the two groups and most other characters diagnostic at species-group level are in accord. The main differences between the groups lie in the reduced antennomere count in *tacta* and *vodensa*, and their lack of specialized strong hairs on the clypeus, which are so obvious in the *oxysma*-group.

Smithistruma tacta sp. n.

HOLOTYPE WORKER. TL 1·7, HL 0·46, HW 0·31, CI 67, ML 0·07, MI 15, SL 0·20, SI 65, PW 0·20, AL 0·46.

Principal dental row of mandible with 7 teeth followed by 4 minute denticles and a small apical tooth. Basal lamella of mandible a long low rounded lobe which is no higher than the basalmost tooth; without a diastema between basal lamella and the basalmost tooth. In full-face view the clypeus with shallowly convex sides which are evenly convergent anteriorly and with a strongly convex anterior margin which is narrowly rounded medially. The anterior margin on each side of the midpoint forms a single evenly convex line which is continuous with the lateral margins, without trace of an anterolateral angle. Outer margins of the fully closed mandibles forming a more or less continuous line with the outer margins of the clypeus in full-face view. Dorsum of clypeus densely clothed with short spatulate hairs which are curved, decumbent and directed anteriorly. Lateral and anterior clypeal margins similarly densely clothed. Dorsum of head with decumbent curved fine hairs, those in front of the vertex directed towards the midline, the remainder directed towards the highest point of the vertex. Upper scrobe margins with a number of fine curved hairs similar to those on the dorsum of the head, and also with three pairs of long laterally projecting flagellate hairs; the cephalic dorsum near the occipital margin with another pair of flagellate hairs which are directed vertically. Antennae with 4 segments; the scape slender and only very weakly curved basally, not flattened. Leading edge of scape without a freely projecting row of strong hairs, only with fine curved pubescence which is subdecumbent to decumbent. Eyes small, the maximum diameter 0·06×HW. Cephalic dorsum reticulate-punctate everywhere, clypeal dorsum more finely punctate but the sculpture partially concealed by the dense pilosity. Pronotum strongly and sharply marginate anteriorly and laterally, the pronotal dorsum with a strong median longitudinal ridge or carina which does not extend onto the mesonotum. Sides of mesonotum angular, of propodeum sharply marginate. Alitrunk in dorsal view with a transverse straight line between the mesonotum and propodeum. Pronotal humeri each with a long laterally directed flagellate hair. Vertically directed flagellate hairs present in pairs on dorsum at midlength of pronotal lateral margination and posterolaterally on mesonotum. Pilosity of dorsal alitrunk otherwise of fine simple strongly curved hairs on the pronotum and mesonotum. Fine simple hairs, some of which may be looped apically, present on dorsal surfaces of petiole, postpetiole and first gastral tergite. Sides of alitrunk unsculptured, the propodeal teeth lamelliform and continuous with the infradental lamellae. Pronotal dorsum unsculptured apart from the strong median carina. Mesonotum reticulate-punctate. Propodeal dorsum and declivity glassy smooth. Dorsum of petiole node finely punctate, postpetiole glassy smooth. First gastral tergite unsculptured except for the basigastral costulae. Spongiform appendages of pedicel segments strongly developed in profile. Petiole node in dorsal view with a broad strip of spongiform material posteriorly. Anterior margin of postpetiole with a narrow spongiform strip, the posterior margin with a much broader band of spongiform tissue which is indented medially. Base of first gastral tergite with a spongiform to lamellar strip which is concave medially. Colour yellow to yellowish brown.

PARATYPE WORKERS. TL 1·7–1·8, HL 0·42–0·46, HW 0·29–0·31, CI 65–70, ML 0·06–0·08, MI 14–17, SL 0·18–0·20, SI 61–67, PW 0·19–0·22, AL 0·44–0·48 (10 measured). As holotype.

Holotype worker, **Ivory Coast**: Droplieu, 10.x.1980 (V. Mahnert & J.-L. Perret) (MNH).

Paratypes. **Ivory Coast**: 2 workers with same data as holotype; 7 workers, Monogaga, 24.x.1980 (V. Mahnert & J.-L. Perret); 1 worker, Man, Mt Tonkoui, 900 m, 13.x.1980 (V. Mahnert & J.-L. Perret) (MHN; BMNH; MCZ).

Non-paratypic material examined. **Ghana**: Tafo (B. Bolton). **Cameroun**: Nkoemvon (D. Jackson); nr Yaounde (G. Terron). **Zaire**: Yangambi (M. Maldague).

Of the seven known Afrotropical species with 4-segmented antennae only two, *tacta* and *marginata*, have the pronotum sharply marginate laterally and equipped medially with a longitudinal carina. These two are separated by the shape and pilosity of the clypeus as indicated in the key, and by the characters noted in the species-group diagnoses. Characters separating *tacta* and *vodensa* are tabulated under the latter.

Smithistruma vodensa sp. n.

(Fig. 20)

HOLOTYPE WORKER. TL 3·0, HL 0·74, HW 0·38, CI 51, ML 0·09, MI 12, SL 0·44, SI 116, PW 0·30, AL 0·80.

Principal dental row of mandible with 7 teeth, followed by 4 minute denticles and a small apical tooth. Basal lamella of mandible a low rounded lobe which is not as high as the basalmost tooth. No diastema between the basal lamella and the basalmost tooth. In full-face view the clypeus with shallowly convex sides

which are evenly convergent anteriorly and with a strongly convex anterior margin which is narrowly rounded medially. The anterior clypeal margin on each side of the midpoint forms a single evenly convex line which is continuous with the lateral margins, without trace of anterolateral angles. Outer margins of the fully closed mandibles forming a more or less continuous line with the outer margins of the clypeus in full-face view. Dorsum and margins of clypeus densely clothed with elevated fine simple hairs which are directed anteriorly. Dorsum of head with decumbent curved fine hairs, those in front of the vertex directed towards the midline, the remainder directed towards the highest point of the vertex. Upper scrobe margins with projecting long flagellate hairs. (One pair is visible in the holotype, at the level of the scrobal apex; more may be present in undamaged specimens, but the holotype is somewhat abraded.) Head long and narrow, the CI of 51 is the lowest yet recorded in any Afrotropical *Smithistruma*. Between the posterior clypeal margin and the frontal lobes, and running back between the lobes, the surface depressed into a shallow inverted V-shaped trench. Upper scrobe margins pinched in behind the frontal lobes, evenly convex behind this and confluent with the convex sides of the head. Occipital margin concave and bordered by a raised lamelliform ridge or flange which is traversed by a number of ribs. In profile the antennal scrobes reduced and shallow, the preocular laminae low and inconspicuous. Clypeus very densely punctate-granular, the inverted V-shaped impression smooth. Cephalic dorsum to level of eyes finely reticulate-punctate, behind this the surface more grossly reticulate-punctate, the punctures becoming larger both posteriorly and away from the midline, and blanketing the entire surface. Antennae with 4 segments, the scape relatively very long (SI 116, the longest yet recorded among Afrotropical *Smithistruma*). The second funicular (third antennal) is an extremely long fusion segment constituting funicular segments 2-4 of the normal 5-merous funiculus; this second funicular segment almost two times longer than the first. On the right funiculus vague vestigial constrictions can be seen marking the original segmental limits, but on the right even these traces are absent. Scapes with simple fine hairs present, without bizarre pilosity; shaft of scape not bent nor flattened but increasing in thickness from base to apex. Pronotum marginate anteriorly and with a median longitudinal carina. Sides of pronotum and mesonotum not marginate but propodeal dorsum meeting the sides in an angle. Metanotal groove broad, deeply impressed, the impressed area blocked off at each side by a short longitudinal lamina running from the mesonotum to the propodeum. Propodeal dorsum with a sharp transverse rim bordering the metanotal impression posteriorly. In profile the propodeal teeth very thin apically, subtended by narrow translucent infradental lamellae. Sides of alitrunk unsculptured except for some weak peripheral punctation. Pronotal dorsum smooth near the median carina but laterally with some low disorganized sculpture. Mesonotum densely punctate. Metanotal groove, propodeal dorsum and declivity smooth except for a few vestigial punctures which are scarcely visible, situated on the propodeum just behind the transverse rim which borders the metanotal groove. Pronotal humeri with long flagellate hairs. Dorsal alitrunk with numerous simple hairs, without bizarre pilosity. Petiole missing from holotype. Postpetiole in profile broadly convex, the spongiform appendages poorly developed. Ventral appendage of postpetiole represented by a lobate translucent thin lamina which contains a few stiffening veins but is not spongiform. First gastral sternite with a basal felt-like fibrous pad which runs across the width of the sclerite, the fibres constituting the felt running longitudinally. In dorsal view the postpetiole unsculptured, bordered anteriorly by a narrow ribbed lamina, without lateral appendages. Posteriorly the postpetiole margin bordered by a ribbed lobate lamina on each side of a broad median gap. Basal lamella of first gastral tergite longitudinally concave and traversed by costulae which do not impinge upon the sclerite proper. This last only with very faint scratch-like markings near the base. Postpetiole with a few fine simple hairs and with fine appressed ground-pilosity. First gastral tergite only with fine appressed ground-pilosity. Colour medium brown.

Holotype worker, **Cameroun**: Nr Yaounde, sample 3123 (*G. Terron*) (ENSA).

The only known species closely related to *vodensa* is *tacta*; the two are separated as follows.

tacta
 Head relatively broad, CI 65-70.
 Scapes relatively short, SI 61-67.
 Smaller species, HL 0.42-0.46.
 Hairs on clypeal dorsum spatulate.
 Pronotum sharply marginate laterally.
 Metanotal groove shallow to absent.
 Ventral appendage of postpetiole
 spongiform.

vodensa
 Head relatively narrow, CI 51.
 Scapes relatively long, SI 116.
 Larger species, HL 0.74.
 Hairs on clypeal dorsum simple.
 Pronotum not marginate laterally.
 Metanotal groove broadly, deeply impressed.
 Ventral appendage of postpetiole
 laminar.

TRICHOSCAPA Emery

(Figs 21, 22)

Trichoscapa Emery, 1869b: 24 [as subgenus of *Strumigenys*]. Type-species: *Strumigenys (Trichoscapa) membranifera* Emery, 1869b: 24, fig. 11, by monotypy.

Trichoscapa Emery; Brown, 1948: 112. [Raised to genus.]

DIAGNOSIS OF WORKER. Afrotropical dacetine ants. Mandibles short triangular (MI 16–20), serially dentate and lacking an apical fork of spiniform teeth. When fully closed the dorsal surface of the mandible with a sharp conspicuous transverse basal margin which is separated from the anterior clypeal margin by a distinct impression or gap. Apical (masticatory) margin of mandible with 12 teeth following a basal lamella, the lamella inflected below the basalmost tooth, not visible when the mandibles are closed. Antennae with 6 segments.

This monotypic genus is very close to *Smithistruma*, being separated only by the differently constructed mandibles. The apparent strong transverse basal margin seen in *Trichoscapa* (Fig. 21) but not in *Smithistruma* (Figs 1–12, 14, 15, 17–20) is a secondary development caused by the dorsal surface of the mandible passing through a sudden downward near right-angled bend at the level of the basalmost tooth, this sharp downward angle running across the entire width of the mandible. The basal lamella, which follows the basalmost tooth in approximately the same plane in *Smithistruma*, is in *Trichoscapa* on the inner margin of the descending surface below the basalmost tooth, and so is usually invisible in full-face view even when the mandibles are open.

The single species included in *Trichoscapa, membranifera*, is an accomplished tramp species in the tropics and the warm temperate zones. Brown & Wilson (1959) suggested an African origin for the species but at that time no specimens of *membranifera* had been reported from the Afrotropical region. A single series from Sierra Leone (in BMNH) shows that the species does indeed occur in sub-Saharan Africa but whether this continent represents its place of origin remains to be seen, for this series may also represent an introduction.

The tramping ability of this small ant has ensured that it has accrued more than its fair share of synonyms. These are dealt with by Brown (1948), and I have no changes nor additions to make to the list.

***Trichoscapa membranifera* (Emery)**

(Figs 21, 22)

Strumigenys (Trichoscapa) membranifera Emery, 1869b: 24, fig. 11. Holotype worker, ITALY: Napoli, Portici (MCSN) [examined].

Strumigenys membranifera race *simillima* Emery, 1890: 69, pl. 8, fig. 5. Holotype worker, ST THOMAS I. (West Indies) (MCSN). [Synonymy by Brown, 1948: 114.]

Strumigenys membranifera var. *santschii* Forel, 1904a: 6. Syntype workers, TUNISIA: Kairouan (*F. Santschi*) (MHN). [Synonymy by Brown, 1948: 114.]

Strumigenys (Cephaloxys) vitiensis Mann, 1921: 461, fig. 22c. Syntype workers, FIJI Is: Vanua Levu, Lasema (*W. M. Mann*) (MCZ) [Synonymy by Brown, 1948: 114.]

Strumigenys (Cephaloxys) silvestriana Wheeler, 1928: 27. Syntype workers, MACAO: (*F. Silvestri*) (MCZ) [Synonymy by Brown, 1948: 114.]

Strumigenys (Cephaloxys) foochowensis Wheeler, 1928: 28. Holotype female, CHINA: Foochow (*F. Silvestri*) (location of type unknown). [Synonymy by Brown, 1948: 114.]

Strumigenys (Cephaloxys) membranifera var. *marioni* Wheeler, 1933: 276. Syntype workers, U.S.A.: Mississippi (*M. R. Smith*) (MCZ). [Synonymy by Brown, 1948: 114.]

Strumigenys (Cephaloxys) membranifera var. *williamsi* Wheeler, 1933: 276. Syntype workers, HAWAII: S. of Olaa, off the road to Puna, iv. 1932, under moss etc. (*F. X. Williams*) (MCZ). [Synonymy by Brown, 1948: 114.]

Trichoscapa membranifera (Emery) Brown, 1948: 113.

WORKER. TL 1.9–2.1, HL 0.46–0.50, HW 0.40–0.44, CI 84–90, ML 0.08–0.10, MI 16–20, SL 0.22–0.24, SI 51–57, PW 0.23–0.26, AL 0.50–0.53 (10 measured).

Mandibles with 12 teeth, arranged in a series of 7 larger teeth basally followed by a series of 4 denticles and a small apical tooth; the 7 basal teeth not all the same size. Dorsal surface of mandible sharply angled

downwards immediately behind the basalmost tooth, this angle running across the width of the mandible and forming a sharp transverse basal margin which is separated from the anterior clypeal margin by a gap or impression. Basal lamella of mandible situated on the descending inner margin below the basalmost tooth and not visible in full-face view. Anterior clypeal margin transverse to broadly shallowly convex, the clypeal margins both anteriorly and laterally lacking projecting hairs of any description. Dorsum of clypeus shining, sometimes with faint sculptural vestiges; dorsum of head behind clypeus reticulate-punctate and dull. Pilosity of head restricted to a single pair of standing hairs at the highest point of the vertex, otherwise the dorsum only having minute appressed pubescence which is very sparse and difficult to see. Clypeus and lateral margins of head hairless, without flagellate or other specialized hairs. Antennal scapes short, bent in the basal third and broadest at the bend, the leading edge with a row of spatulate to spoon-shaped freely projecting hairs. Eyes small, of only a few ommatidia, situated at the ventral scrobe margin. Pronotum strongly marginate anteriorly and laterally, mesonotum and propodeum not marginate. Dorsal outline of alitrunk in profile very shallowly concave between mesonotum and propodeum but the metanotal groove absent. Propodeum descending posteriorly to the broad strongly spongiform infradental lamellae. Separated propodeal teeth absent, either indistinguishable from the large infradental lamellae or at most forming a minute point close to the dorsum of the lamella. Sides of alitrunk smooth. Pronotal dorsum smooth or at most with only the very faintest vestiges of sculpture, which may include an extremely faint median longitudinal ridge. Mesonotum with some fine superficial punctures but these may be very feeble and difficult to see. Propodeal dorsum and declivity smooth. Standing hairs absent from dorsal alitrunk; scattered sparse minute appressed pubescence present. Humeral angles of pronotum without flagellate or other hairs. Spongiform appendages of the pedicel segments massively developed in profile. Petiole ventrally with a deep curtain-like appendage, the dorsum of the peduncle with a narrow spongiform strip which runs up almost to the highest point of the node. Lateral spongiform appendages of the petiole node large and strongly prominent. Lateral and ventral spongiform lobes of postpetiole very large, much larger than the exposed area of the disc. In dorsal view both petiole and postpetiole smooth, bounded laterally by dense spongiform tissue. Petiole node also with a posterior spongiform strip linking the large lateral appendages. Postpetiole also with transverse lamellate spongiform tissue bounding the anterior and posterior margins. Base of first gastral tergite with a transverse strip which is spongiform laterally but lamellate medially where it is overlapped by the convex posterior strip of the postpetiole. Basigastral costulae present, grouped on each side of a median clear area; the gaster otherwise unsculptured. Dorsal surfaces of petiole, postpetiole and gaster without hairs of any description but with minute appressed very sparse pubescence. Colour dull yellow to yellowish brown.

Superficially similar to some *Smithistruma* species, *T. membranifera* is easily distinguished from members of that genus by the characteristic form of the mandibles and strongly marginate pronotum, and by the near absence of standing hairs. Feeding behaviour of *membranifera* was investigated by Wilson (1954) who found that it would eat a wide range of small soft bodied arthropods.

MATERIAL EXAMINED

Sierra Leone: Njala (*E. Hargreaves*). **Egypt:** no loc. (Min. of Agriculture coll.); Banage (*Alfieri*). **U.S.A.:** Miss., West Point (*E. E. Byrd*). **Italy:** Napoli, Portici.

GLAMYROMYRMEX Wheeler

(Figs 23–33)

Glamyromyrmex Wheeler, 1915: 487. Type-species: *Glamyromyrmex beebi* Wheeler, 1915: 488, fig. 2, by monotypy.

Borgmeierita Brown, 1953a: 23. Type-species: *Codiomyrmex excisus* Weber, 1934: 51, fig. 9, by original designation. [Synonymy by Brown, 1973a: 35.]

DIAGNOSIS OF WORKER. Afrotropical dacetine ants. Mandibles relatively short (MI 8–24), subtriangular in full-face view and powerfully developed, serially dentate and lacking an apical fork of spiniform teeth. When fully closed the mandibles are overlapped basally by the clypeus. In profile the mandibles with their upper and lower margins diverging from base to apex and the distal portion passing into a strong downcurved arc so that part or most of the apical margin is at right-angles to the long axis of the head. Apical (masticatory) margin of mandible with 8–11 teeth following a conspicuously differentiated prominent basal lamella; the basal series of teeth following the lamella large and strong, the lamella itself partially or wholly concealed by the clypeus when the mandibles are closed. Antennae with 6 segments.

Two species from the Afrotropical region which were formerly included in *Codiomyrmex* are here transferred to *Glamyromyrmex*. Brown (1973b) has indicated that the former name may be a junior synonym of the latter. Whether this proves to be correct or not, the previously described Afrotropical species are certainly closer to the type-species of *Glamyromyrmex* than they are to the type-species of *Codiomyrmex* (*C. thaxteri* Wheeler). At present there are 11 Afrotropical and 7 Neotropical species of *Glamyromyrmex* known, though it is most likely that some or all of the species currently placed in *Codiomyrmex* and *Chelystruma*, from Australia and the Neotropical region, may be referred to *Glamyromyrmex* in the future. *Glamyromyrmex* and its relatives are closely related to *Smithistruma*, differing in the much more powerful construction of the mandibles in the former. The species currently placed in *Glamyromyrmex* are a fairly diverse assemblage and may even represent several separate lines of descent from *Smithistruma*-like ancestral forms. As mentioned under *Smithistruma* the stability of the short-mandibulate dacetine genera is in question and a world revision of them would most probably show some marked changes in generic limits.

Previous work on *Glamyromyrmex* has mostly been limited to the description of new species but the genus has been defined by Brown (1950a) on the basis of the sparse material then available, and the Neotropical species have been keyed by Kempf (1960).

List of Afrotropical *Glamyromyrmex*

<i>tetragnathus</i> -group	<i>loveridgei</i> (Brown) comb. n.
<i>africanus</i> sp. n.	<i>sistrurus</i> sp. n.
<i>tetragnathus</i> (Taylor) comb. n.	<i>ravidurus</i> -group
<i>tagon</i> -group	<i>ravidurus</i> sp. n.
<i>tagon</i> sp. n.	<i>thuvidus</i> -group
<i>sahurus</i> sp. n.	<i>thuvidus</i> sp. n.
<i>loveridgei</i> -group	<i>trymalus</i> sp. n.
<i>crypturus</i> sp. n.	<i>tukultus</i> sp. n.

Key to species (workers)

- 1 Clypeal dorsum without appressed small hairs of any description, all hairs present on the clypeal dorsum conspicuously elevated. (Cameroun) *trymalus* (p. 333)
- Clypeal dorsum with appressed small hairs which may be simple, spatulate or scale-like 2
- 2 Appressed hairs on clypeus simple, fine and minute 3
- Appressed hairs on clypeus flattened, spatulate or scale-like 6
- 3 Posteromedian area of cephalic dorsum raised into a broad tumulus which is bounded laterally by an approximately flat area on each side (Fig. 27). Pronotum laterally sharply marginate throughout, the margins overhanging the sides (Fig. 30). Postpetiolar disc finely longitudinally costulate 4
- Posteromedian area of cephalic dorsum not raised into a broad tumulus, instead the dorsum is more or less evenly convex from side to side. Pronotum laterally not sharply marginate throughout. Postpetiolar disc smooth or at most with lateral shagreening 5
- 4 Lateral margins of head in full-face view with projecting flagellate hairs. Postpetiole and first gastral tergite with numerous long flagellate hairs. (Gabon) *africanus* (p. 322)
- Lateral margins of head in full-face view without flagellate hairs. Postpetiole and first gastral tergite with sparse short straight hairs. (Cameroun, Angola) *tetragnathus* (p. 323)
- 5 With the head in profile the edges of the clypeal lobes enormously thickened, much thicker than the maximum width of the scape (Fig. 32). Anterior clypeal margin with a semicircular median impression flanked by a lobe on each side (Fig. 25). CI 70–71, MI 8–9. (Rwanda) *tagon* (p. 325)
- With the head in profile the edges of the clypeal lobes narrow, narrower than the maximum width of the scape (Fig. 33). Anterior clypeal margin broadly evenly shallowly concave from corner to corner (Fig. 26). CI 75–78, MI 16–17. (Rwanda) *sahurus* (p. 326)
- 6 Entire cephalic dorsum densely clothed with appressed scale-like hairs, without other pilosity of any description and the sides of the head without projecting flagellate hairs 7
- Cephalic dorsum not clothed with appressed scale-like hairs, with other pilosity present, and the sides of the head with projecting flagellate hairs 8
- 7 First gastral tergite with erect fine simple hairs present. (Ivory Coast) *tukultus* (p. 334)
- First gastral tergite with appressed spatulate to scale-like hairs only. (Cameroun) .. *ravidurus* (p. 331)

- 8 Cephalic dorsum behind clypeus with widely spaced broad foveolate punctures, with a cratered appearance, the surface smooth between the punctures. Minute yellow species, HL 0.43–0.44, HW 0.29. (Kenya) *thuvidus* (p. 332)
- Cephalic dorsum behind clypeus reticulate-punctate, without widely spaced broad foveolate punctures, without a cratered appearance. Larger black or blackish brown species, HL 0.49 or more, HW 0.34 or more 9
- 9 With postpetiole in dorsal view the sides of the disc completely enclosed by dense spongiform tissue. Dorsum of petiole node sculptured, at least in part. Basal lamellate band of first gastral tergite broad and continuous, indented anteromedially but not interrupted 10
- With postpetiole in dorsal view the spongiform tissue restricted to the posterolateral angles of the disc and fading out anteriorly. Dorsum of petiole node unsculptured and smooth. Basal lamellate band of first gastral tergite narrow at sides and interrupted medially. (Malawi) *loveridgei* (p. 328)
- 10 Mandible with 6 enlarged teeth, without medially projecting broad spatulate hairs between the basalmost tooth and the basal lamella (Fig. 24). (Cameroun) *sistrurus* (p. 329)
- Mandible with 5 enlarged teeth, with medially projecting broad spatulate hairs between the basalmost tooth and the basal lamella (Fig. 23). (Ghana) *crypturus* (p. 327)

The *tetragnathus*-group

(Figs 27, 30)

Outline shape of head as Fig. 27. Mandibles with 8 teeth consisting of 5 large slightly recurved spiniform teeth following the basal lamella, and an apical series of 3 denticles which share a common base. Anterior clypeal margin indented medially. Lateral clypeal margin not expanded into a broad lobe on either side, the outer margins of the mandibles at full closure intersecting the anterior clypeal margin at or very close to the anterolateral corners. Head dorsoventrally flattened, the dorsum posteromedially raised into a broad tumulus. Broad rounded occipital lobes present which are strongly prominent posteriorly. Pronotum sharply marginate laterally, the marginations overhanging the sides and the dorsum between the marginations shallowly transversely concave. Sculpture of cephalic dorsum behind clypeus weak and superficial, without well-developed rugulose or punctate sculpture. Clypeus with minute appressed pubescence.

The two species placed in this group, *africanus* and *tetragnathus*, are closely related forms, very conspicuous in appearance and easily distinguished from all the other Afrotropical members of *Glamyromyrmex*. They are the members of this genus which least resemble *Smithistruma* and the construction of the head renders them immediately recognizable.

Both species are of central African origin, with *africanus* known from Gabon and *tetragnathus* from Cameroun and Angola.

Glamyromyrmex africanus sp. n.

(Fig. 27)

HOLOTYPE WORKER. TL 3.0, HL 0.82, HW 0.70, CI 85, ML 0.16, MI 20, SL 0.30, SI 43, PW 0.36, AL 0.68.

Mandibles with a broad basal lamella (partially visible as mandibles slightly opened) followed by a principal dental row of 5 large triangular teeth which are slightly recurved and evenly spaced on the strongly downcurving arch of the mandibular masticatory margin. Basalmost tooth following the lamella without a diastema, slightly smaller than the second tooth. Third tooth from the basal lamella the largest, fourth and fifth tooth slightly smaller. Distal to the principal dental row is a series of three denticles which share a common base. In profile the mandibles rapidly increasing in width from base to apex, the upper and lower borders strongly divergent, the former arching up above the level of the anterior clypeal margin, the latter shallowly concave and downcurved; apical margin as seen in profile strongly arched-convex. With the head in full-face view the anterior clypeal margin with a concave median indentation, the clypeus broad but the lateral free margins not extended into lobes and noticeably narrower than the sides of the head behind the clypeus. Sides of head evenly shallowly convex, broader behind than in front. Occipital margin extended backwards as a rounded lobe on each side of a central broad impression, the median portion of which is transverse. The margin of the occipital impression bounded on the dorsum by a continuous low rim or crest. Dorsum of head behind clypeus raised medially into a broad tumulus which is convex in both directions but does not reach the lateral margins; rather the tumulus is surrounded on all sides by more or less flat areas of cuticle. Frontal lobes and frontal carinae fused to form a continuous upper scrobe margin

which is strongly prominent laterally, conceals the scrobes from dorsal view, and is continuous with the flattened posterolateral portions of the head. Antennal scrobes deep and extensive, anteriorly divided into upper and lower compartments by the weak preocular laminae and with the small eye situated on the ventral scrobe margin. In profile the dorsal cephalic tumulus is balanced by an even more strongly prominent mid-ventral tumulus whose maximum convexity occurs at about the level of the eye and behind which the ventral surface is markedly concave. Antennal scapes short (SI 43) and feebly clavate, not bent near the base, the leading edge evenly shallowly convex and lacking projecting hairs. Dorsum of head with dense abundant decumbent to appressed fine simple hairs, shortest near the clypeus (which has only minute fine pubescence) and longest occipitally, directed anteriorly or anteromedially and densest on the lateral margins; the latter also with 3 pairs of long projecting flagellate hairs. Dorsum of head with minute shallow pits from which the hairs arise, otherwise unsculptured except for a feeble superficial shagreening in places; clypeus smooth. Sides of alitrunk sharply laterally marginate throughout, most strongly so on the pronotum where the marginations are prominent and overhang the sides. Pronotum also marginate anteriorly and with a median longitudinal ridge or carina dorsally. Dorsum of mesonotum separated from the short propodeal dorsum by a low transverse crest; metanotal groove absent. Propodeal teeth very broad basally, rapidly tapering apically and with the extreme apices overcurved. Infradental lamellae much narrower than the propodeal teeth, the latter with more than half their length standing free of the lamellae. Sides of alitrunk unsculptured except for the punctate mesopleuron. Dorsal alitrunk with a few superficial rugular vestiges on the promesonotum but only the median carina conspicuous. Lateral margination of the alitrunk with 2-3 long flagellate hairs on each side, otherwise the dorsum and margins only with fine scattered simple pilosity. Peduncle of petiole long, the node bluntly triangular in profile. Spongiform ventral process of petiole peduncle massively developed and curtain-like, about as deep as the node is high. Other spongiform material on petiole reduced to a pair of short aliform prominences situated lateroventrally when the node is viewed from above and from which a narrow crest arises which follows the posterior margin of the node. Petiole node sparsely rugulose, disc of postpetiole sparsely irregularly longitudinally costulate. Ventral spongiform appendages of postpetiole moderate, the lateral appendages narrow in dorsal view, broadest at the posterolateral angles. Anterior face of postpetiolar disc with a narrow bordering lamella, the posterior margin without spongiform material, bordered instead only by a sharp narrow and shallowly convex rim which abuts a similar but concave rim bordering the base of the first gastral tergite. First gastral tergite without basal spongiform material but with a lamellate area laterobasally, immediately behind the lateral appendages of the postpetiole; this lamellate area thrown into strong ridges which form the origins of the lateral basigastral costulae. First gastral sternite without a basal spongiform pad. Primary basigastral costulae, arising at the base of the tergite, few in number and mostly lateral in origin; more posteriorly numerous finer costulae arise which form a dense band over about one-third of the length of the tergite. Petiole, postpetiole and first gastral tergite with numerous long fine flagellate hairs. Black, the spongiform appendages pale.

Holotype worker (gold-palladium coated), **Gabon**: Makokou, berlese no. 17, x-xii. 1972, rain forest (*I. Lieberburg*) (MCZ).

The only known close relative of *africanus* is *tetragnathus*, from Cameroun and Angola. Differences to separate these two species are tabulated under *tetragnathus*.

***Glamyromyrmex tetragnathus* (Taylor) comb. n.**

(Fig. 30)

Codiomyrmex tetragnathus Taylor, 1965: 225, figs 1, 2. Holotype worker, ANGOLA: Dundo, Route Turismo, approx 7°02'S, 20°51'E, gallery forest, 28.iii.1962, no. 16888, R. Luachimo, 'berlesate by native collector' (MCZ) [examined].

WORKER. TL 2.4-2.8, HL 0.60-0.70, HW 0.49-0.58, CI 79-83, ML 0.14-0.16, MI 22-24, SL 0.25-0.28, SI 47-51, PW 0.28-0.34, AL 0.58-0.62 (4 measured).

Mandibles with a broad basal lamella followed by a row of 5 large triangular teeth which are slightly recurved and evenly spaced on the strongly downcurving arch of the apical margin. Distal to this tooth row is a series of 3 denticles which share a common base on a low process. In profile the mandibles rapidly increasing in width from base to apex, the upper and lower borders strongly divergent, the former arching up above the level of the anterior clypeal margin, the latter shallowly concave and downcurved; apical margin as seen in profile strongly arched-convex. With the head in full-face view the anterior clypeal margin with a median indentation, the clypeus broad but the lateral free margins not extended into lobes and noticeably narrower than the sides of the head behind the clypeus. General shape of head in profile and

full-face views as described for *africanus*. Antennal scapes short (SI 47–51) and feebly clavate, not bent near the base, with the leading edge more or less evenly convex and lacking projecting hairs. Clypeal dorsum with minute appressed pubescence which is directed anteriorly. Dorsum of head with anteriorly or anteromedially directed minute appressed hairs which are approximately the same length everywhere on the dorsum and no longer than the clypeal pubescence. Lateral margins of head without flagellate hairs. Clypeus smooth. Dorsum of head with minute scattered pits from which the hairs arise, otherwise unsculptured except for a feeble superficial shagreening in places. Sides of alitrunk sharply laterally marginate throughout their length, most strongly so on the pronotum where the marginations are prominent and overhang the sides. Pronotum also marginate anteriorly and with a median longitudinal ridge or carina dorsally. Dorsum of mesonotum separated from the short propodeal dorsum by a low transverse crest; metanotal groove absent. Propodeal teeth very broad basally, rapidly tapering apically and with the extreme apices suddenly upcurved. Infradental lamellae much narrower than the propodeal teeth, the latter with more than half their length standing free of the lamellae. Sides of alitrunk unsculptured except for the punctate mesopleuron and some weak peripheral sculpture round the margins of the segments. Dorsal alitrunk with some superficial rugular vestiges on the pronotum and mesonotum beside the median carina. Lateral margins of alitrunk with two pairs of long simple hairs, the first pair at the pronotal humeri, the second pair just in front of the transverse crest that separates mesonotum from propodeum. Dorsal alitrunk otherwise with only sparse appressed simple hairs which are very short. Spongiform ventral appendage of petiole peduncle massively developed and curtain-like, about as deep as the node is high. Other spongiform material on petiole reduced to short aliform prominences situated lateroventrally when the node is viewed from above. Petiole node sparsely rugulose, disc of postpetiole finely densely and quite regularly longitudinally costulate. Lateral spongiform appendages of petiole narrow in dorsal view, broadest posterolaterally. Anterior face of the postpetiolar disc with a narrow bordering lamella, the posterior margin bordered by a convex rim which abuts a similar but concave rim bordering the base of the first gastral tergite. First gastral tergite lamellate basally, not spongiform, with numerous strong basigastral costulae and with many secondary costulae arising between them on the body of the tergite. First gastral sternite without a basal spongiform pad. Petiole, postpetiole and first gastral tergite with scattered short straight simple hairs. Colour blackish brown to black.

The only known relative of *tetragnathus* is *africanus*; the two are separated as follows in the worker.

<i>africanus</i>	<i>tetragnathus</i>
Larger species with shorter antennal scapes, HW 0.70, SI 43.	Smaller species with longer antennal scapes, HW 0.49–0.58, SI 47–51.
Lateral margins of head in full-face view with 3 pairs of projecting flagellate hairs.	Lateral margins of head in full-face view without flagellate hairs.
Appressed cephalic pilosity longer posteriorly than anteriorly; much longer than the clypeal pubescence.	Appressed cephalic pilosity very short, of approximately equal length everywhere; no longer than the clypeal pubescence.
Postpetiole and first gastral tergite with numerous long fine flagellate hairs.	Postpetiole and first gastral tergite with simple sparse short straight hairs.

MATERIAL EXAMINED

Cameroun: Nkoemvon (*D. Jackson*); nr Yaounde (*G. Terron*). **Angola:** Dundo.

The *tagon*-group (Figs 25, 26, 32, 33)

Outline shape of head as Figs 25, 26. Mandibles with 8 teeth consisting of a small denticle close to the basal lamella followed by a series of 5 large teeth and an apical pair of denticles which arise from a common base. Anterior clypeal margin broadly and evenly concave or sharply indented medially. Lateral clypeal margins expanded into a lobe on each side, the outer margins of the mandibles at full closure intersecting the anterior clypeal margin some distance medially of the anterolateral corners. Head not dorsoventrally flattened, without a broad convex tumulus posteromedially on the dorsum. Posteriorly projecting rounded occipital lobes absent. Pronotum not sharply marginate laterally, the dorsum transversely flat to shallowly

convex. Cephalic sculpture behind clypeus finely and very densely reticulate-punctate, with a granular appearance. Clypeus with minute appressed pubescence.

The two species in this group, *dagon* and *sahurus*, are both known only from Rwanda. They are characterized chiefly by their dentition and their possession of a broad clypeus whose free lateral margins are convex and expanded into a lobe on each side. The character is much more strongly expressed in *dagon* than in *sahurus* and is accompanied in the former by a massive thickening of the lateral free margins of the clypeus.

Glamyromyrmex dagon sp. n.

(Figs 25, 32)

HOLOTYPE WORKER. TL 2.0, HL 0.57, HW 0.40, CI 70, ML 0.05, MI 9, SL 0.24, SI 60, PW 0.26, AL 0.52.

Mandibles appearing very short in full-face view (MI 8-9) as the apical (masticatory) margin is at a right-angle to the long axis of the head from the second tooth to the apex. Basal lamella of mandible, which is concealed by the clypeus at full closure, followed by a short diastema and a denticle. Distal to the denticle is a row of 5 large teeth which are slightly recurved, and apically two denticles which share a common base are present. In profile the upper mandibular margin curves upwards above the level of the anterior clypeal margin and the apical (masticatory) margin forms a near-vertical shallowly convex arch. Anterior clypeal margin in full-face view convex on each side of a deep median concavity, the lateral free margins of the clypeus expanded into a smoothly rounded prominent broad lobe on each side so that the outer margins of the closed mandibles intersect the anterior clypeal margin some distance medially of the anterolateral corners. Upper scrobe margins shallowly concave and feebly divergent posteriorly, the lateral margins of the occipital lobes behind this are shallowly convex and round behind into the smoothly concave occipital margin. In profile the edges of the laterally expanded clypeal lobes are greatly thickened in front of the level of the antennal insertions, the maximum thickness distinctly greater than the maximum width of the scape. Eyes present, small, situated on the ventral margin of the deep scrobe. Scaepes of moderate length (SI 60), narrowly clavate and lacking projecting hairs on the leading edges. Dorsum of head with a single pair of erect fine hairs situated on each side of the midline close to the occipital margin. Otherwise the head only with very short fine simple hairs everywhere which are appressed and directed anteriorly; flagellate long hairs absent. Clypeus with scattered minute appressed pubescence only. Dorsum of clypeus, and of head in a band immediately behind the clypeus, glassy smooth. Remainder of cephalic dorsum finely and densely reticulate-punctate. Anterior border of pronotum narrowly marginate, the sides of the pronotum immarginate anteriorly but separated from the dorsum by a blunt angle posteriorly. In profile the promesonotum dorsally forming a single convex outline which is separated from the propodeal dorsum by a small step, which appears as a transverse rim in dorsal view, the propodeum being on a slightly lower level than the mesonotum and marginate laterally. Infradental lamellae of propodeum broad, the propodeal teeth represented only by a short narrow denticle standing free of the lamella. Sides of alitrunk glassy smooth except for peripheral punctate sculpture. Pronotal dorsum unsculptured, mesonotum densely punctate, propodeum smooth anteriorly but with some punctures between the bases of the teeth. Pronotum and mesonotum each with a single pair of long erect simple hairs, the dorsum otherwise only having scattered short appressed hairs which are directed roughly towards the midline. Spongiform appendages of pedicel segments massively developed in profile. Petiole node in dorsal view unsculptured, broader than long, flanked on each side by a prominent spongiform process, the two linked across the posterior margin of the node by a narrow lamella. Disc of postpetiole glassy smooth, very broad and surrounded by spongiform or lamellate tissue on all sides. Spongiform tissue broadest posterolaterally, narrowest medially where it is contracted down to a very narrow rim along the posterior margin of the disc. Base of first gastral tergite with a spongiform strip which is thickest laterally. Basigastral costulae sparse in centre of tergite, denser laterally. Dorsal surfaces of petiole, postpetiole and gaster with sparse erect simple pilosity and also with much shorter appressed widely scattered simple hairs. Colour yellowish brown.

PARATYPE WORKER. TL 2.1, HL 0.59, HW 0.42, CI 71, ML 0.05, MI 8, SL 0.25, SI 60, PW 0.28, AL 0.56. As holotype.

Holotype worker, **Rwanda**: Rangiro, i.1976, forest humus, 1800 m (*P. Werner*) (MHN).

Paratype. 1 worker with same data as holotype (BMNH).

G. dagon is immediately recognizable as no other African species has such short mandibles or such a bizarre clypeal structure. Its only close relative is *sahurus* and characters separating the two are tabulated under the latter name.

Glamyromyrmex sahours sp. n.

(Figs 26, 33)

HOLOTYPE WORKER. TL 2.3, HL 0.56, HW 0.42, CI 75, ML 0.09, MI 16, SL 0.25, SI 57, PW 0.28, AL 0.58.

Mandibles in full-face view with the basal lamella mostly concealed by the clypeus at full closure but its margin continued as an oblique edge leading to the first tooth, which is thus some distance from the clypeal margin. Basalmost tooth small, reduced to a denticle. Distal to this is a row of 5 large teeth which are slightly recurved, and apically two denticles which share a common base are present. In profile the upper and lower mandibular margins are strongly divergent from base to apex, the dorsal margin curving upwards until it is above the level of the anterior clypeal margin and the apical (masticatory) margin forming a shallowly convex arch which is approximately at a right-angle to the long axis of the head. Anterior clypeal margin shallowly concave in full-face view, the lateral free clypeal margins expanded into a broad but shallow lobe on each side. Upper scrobe margins divergent posteriorly, straight to very shallowly concave. Posteriorly the upper scrobe margins merge with the weakly convex lateral occipital lobes which round posteriorly into the broadly shallowly concave occipital border. In profile the lateral free margins of the clypeal lobes not grossly thickened, narrower than the maximum width of the scape. Eyes present, small, situated on the ventral margin of the deep scrobe. Scapes of moderate length (SI 57–60), narrowly clavate and lacking projecting hairs on the leading edges. Dorsum of head with a pair of erect fine hairs situated close to the midline and close to the occipital margin. Head otherwise devoid of elongate hairs; lacking flagellate hairs but fairly densely clothed with curved to hooked anteriorly directed short simple hairs. Clypeus with minute appressed pubescence only. Clypeus shiny with a superficial punctulate patterning; dorsum of head behind clypeus finely but very densely and conspicuously reticulate-punctate and dull. Anterior pronotal border weakly marginate, the sides not marginate and rounded anteriorly but separated from the dorsum by a weak blunt angle posteriorly. Mesonotum not, and propodeum only weakly bluntly marginate laterally. Mesonotum separated from propodeum on dorsum by an extremely feeble ridge or crest. In profile the mesonotum slightly raised but not separated from the propodeum by a groove. Propodeal teeth vestigial to absent, not or only weakly differentiated from the infradental lamellae as minute points. Sides of alitrunk glassy smooth, without sculpture except on the extreme periphery. Pronotal dorsum unsculptured and shining; mesonotum with a smooth median longitudinal strip but punctate on each side of it; propodeum smooth anteriorly but punctate at the top of the declivity. Pronotum and mesonotum each with a single pair of long fine subflagellate hairs, otherwise only short simple appressed hairs which are directed towards the midline are present. Spongiform appendages of pedicel segments massively developed in profile. Petiole node in dorsal view unsculptured, broader than long, equipped with a strongly prominent spongiform process on each side and the two linked by a narrow lamella which runs across the posterodorsal margin of the node. Postpetiolar disc with a smooth broad median longitudinal strip but with faint shagreening on each side, the postpetiole surrounded by spongiform or lamellate material. The shallowly convex anterior margin of the postpetiole is bordered by a narrow lamella which is confluent with the lateral spongiform tissue on each side. The latter is thickest posterolaterally but narrows down to a vestigial strip posteromedially where the posterior postpetiolar margin is most strongly convex. Base of first gastral tergite with a spongiform transverse trip which narrows medially behind the posteriormost point of the postpetiole. First gastral tergite with conspicuous dense basigastral costulae grouped on each side of a median smooth area. Dorsal surfaces of petiole, postpetiole and first gastral tergite with scattered erect fine hairs and with scattered short simple appressed hairs. Colour brown.

PARATYPE WORKERS. TL 2.1–2.3, HL 0.52–0.56, HW 0.40–0.42, CI 75–78, ML 0.09, MI 16–17, SL 0.24–0.25, SI 57–60, PW 0.26–0.28, AL 0.54–0.58 (3 measured).

As holotype but the mesonotal sculpture may consist of punctures everywhere, obliterating the median clear area seen in the holotype.

Holotype worker, **Rwanda**: Rangiro, ix.1976 (P. Werner) (MHN).

Paratypes. 3 workers with same data as holotype (MHN; BMNH; MCZ).

Along with *daon*, *sahours* forms a close species-pair known only from Rwanda and characterized by the form of the mandibles and clypeus, though the modification of the latter is much more extreme in *daon* than in *sahours* (Figs 25, 26). The two species are separated as follows in the worker.

daon
CI 70–71, MI 8–9

sahours
CI 75–78, MI 16–17.

daon – cont.

Anterior clypeal margin with a deep median impression flanked on each side by a convex lobe.

Lateral free margins of clypeal lobes greatly thickened, thicker in profile than the maximum width of the scape.

Lateral portions of postpetiolar disc smooth.

sahurus – cont.

Anterior clypeal margin shallowly concave.

Lateral free margins of clypeal lobes not thickened, in profile much narrower than the maximum width of the scape.

Lateral portions of postpetiolar disc finely sculptured.

The *loveridgei*-group

(Figs 23, 24)

Outline shape of head as Figs 23, 24. Mandibles with 7–8 teeth. Either with 6 teeth plus a pair of apical denticles which share a common base (*sistrurus*), or with 5 teeth plus an apical series of 3 denticles which share a common base (*loveridgei*), or with 5 teeth plus a minute apical pair of denticles (*crypturus*). Anterior clypeal margin shallowly convex to extremely feebly evenly concave, not indented medially nor deeply concave. Lateral clypeal margins not expanded into lobes on each side, the outer margins of the mandibles at full closure intersecting the anterior clypeal margin at the anterolateral corners. Head not dorsoventrally flattened and without a posteromedian broad tumulus dorsally. Posteriorly projecting rounded occipital lobes absent. Pronotum not sharply marginate laterally, the dorsum transversely convex to approximately flat. Sculpture of head behind clypeus strongly reticulate-punctate. Clypeus with scale-like to spatulate appressed hairs. Flagellate hairs present on lateral margins of head.

G. loveridgei from Malawi, and the westerly distributed species *sistrurus* from Cameroun and *crypturus* from Ghana, have the head more strongly sculptured than in other Afrotropical representatives of the genus. Basically this sculpture is a strong dense reticulate-punctuation but a tendency to rugulation is present due to the alignment of adjacent punctures, whose walls form rugule-like ridges.

***Glamyromyrmex crypturus* sp. n.**

(Fig. 23)

HOLOTYPE WORKER. TL 2.0, HL 0.53, HW 0.37, CI 70, ML 0.10, MI 19, SL 0.21, SI 57, PW 0.24, AL 0.54.

Mandibles with a principal row of 5 enlarged teeth. Basally the mandible with a broad and extensive lamella which has in the small diastema between itself and the basalmost tooth a medially directed long broadly spatulate hair. An even longer but not so broadly spatulate hair projects medially from a point closer to the clypeus but more remote from the masticatory margin than the broadly spatulate hair. If the mandibles are fully closed (ajar in the holotype) these hairs may be difficult to see. Basalmost tooth smaller than the more strongly recurved second tooth, the second smaller than the third and fourth, the fifth slightly smaller than the fourth. Distal to the fifth tooth detail is difficult to see but there appears to be a pair of vestigial denticles. In profile the upper and lower mandibular margins are strongly divergent from base to apex and the upper margin curves up above the level of the anterior clypeal margin. The apical margin, from the second tooth to the apex, is almost at right-angles to the long axis of the head. Anterior clypeal margin transverse, the lateral free margins diverging anteriorly from the frontal lobes and with a few projecting spatulate to spoon-shaped hairs. Maximum width of clypeus greater than the width across the frontal lobes. Upper scrobe margins diverging posteriorly, the sides of the head convex and the occipital margin concave. Eyes small, situated on the ventral scrobe margin. Antennal scapes weakly clavate, the leading edges shallowly convex and equipped with apically curved spatulate hairs. Clypeus densely clothed with appressed small scale-like hairs which are distinctly shorter than the basalmost tooth. Hairs on dorsum of head immediately behind the clypeus short spatulate and appressed, but moving towards the occiput the hairs become more elevated and more narrowly spatulate, anteriorly arched or curved. At the highest point of the vertex the hairs are narrowly spatulate but further back they become simple, though still curved anteriorly. Clypeus smooth and shining, remainder of cephalic dorsum broadly and strongly reticulate-punctate. Three pairs of long flagellate hairs present; one pair on the dorsum close to the occipital margin, one pair at the occipital corners and one pair at the apices of the scrobes. Anterior border of pronotum marginate, the sides not marginate. Sides of mesonotum and propodeum marginate, the latter more strongly so than the former, the two not separated by a ridge or crest across the dorsum.

Promesonotal dorsum in profile forming a more or less even shallow convexity which is on a slightly higher level than the propodeum. Metanotal groove absent. Propodeal teeth incorporated in the infradental lamellae. Sides of alitrunk smooth except for a few longitudinal rugulae anteriorly on the pronotum. Dorsal alitrunk smooth except for some weak sculptural vestiges on the mesonotum which, however, is mostly smooth. Pronotum and mesonotum each with a single pair of long flagellate hairs, otherwise the dorsum only with scattered fine simple hairs which are arched towards the midline. Spongiform appendages massively developed in profile. Petiole node in dorsal view roughly transversely rectangular, slightly broader than long and fractionally broader behind than in front, the anterolateral angles approximately right-angular and the surface with scattered weak punctures. Spongiform material strongly prominent posterolaterally, linked across the posterior margin of the node by a broad translucent lamella. Postpetiole disc smooth and shining, surrounded on all sides by dense spongiform tissue. Posteromedially the spongiform tissue narrowing down to a slender lamella. Base of first gastral tergite with a broad transverse ridged lamellate strip which is shallowly concave anteromedially but not interrupted. Basigastral costulae short, arranged in two groups, on each side of a clear median strip; the costulae shortest near this clear area and longer laterally. Petiole dorsum with simple long fine hairs which are curved posteriorly. Postpetiole with simple fine hairs which are mostly erect or suberect and hooked or curved apically. Gaster with scattered simple erect hairs. Colour blackish brown.

Holotype worker, **Ghana**: Tafo, 29.xi.1969, ant ecology sample AES 433 (*D. Leston*) (BMNH).

Closest related to *sistrurus*, characters separating *sistrurus* and *crypturus* are tabulated under the former name.

***Glamyromyrmex loveridgei* (Brown) comb. n.**

Codiomyrmex loveridgei Brown, 1953a: 21. Holotype worker, MALAWI: N. Prov., Nyika Plateau, above Nchenachena, 5000 ft (1524 m), 1948 (*A. Loveridge*) (MCZ) [examined].

WORKER. TL 2.2, HL 0.54, HW 0.39, CI 72, ML 0.11, MI 20, SL 0.22, SI 56, PW 0.27, AL 0.54.

Mandibles with a broad basal lamella which is followed without a diastema by 5 enlarged teeth and an apical series of 3 denticles which share a common base. Upper and lower mandibular margins in profile strongly divergent from base to apex, the apical (masticatory) margin a strongly downcurved arch but the dorsal mandibular border not upcurved beyond the level of the anterior clypeal margin. In full-face view the anterior clypeal margin shallowly convex; posteriorly the clypeus narrowing to the frontal lobes and the preocular laminae visible. Upper scrobe margins divergent posteriorly from the small frontal lobes, not strongly expanded laterally. Behind the level of the scrobes the sides shallowly convex and rounding into the more or less transverse occipital border. Eyes small, situated on the ventral scrobe margin. Antennal scapes slightly curved and feebly clavate, the leading edge lacking long projecting hairs but with numerous fine apically directed simple decumbent hairs. Clypeal dorsum densely clothed with elongate flattened scale-like hairs which are directed forwards and are closely appressed to the surface. Remainder of cephalic dorsum with decumbent fine dense anteriorly arched simple hairs. Close behind the clypeal posterior margin the hairs are intermediate in shape between the scale-like clypeal pilosity and the simple cephalic hairs, being narrowly spatulate or feebly clavate apically. A laterally projecting long flagellate hair present at the apex of the antennal scrobe on each side and another at each occipital corner. Clypeus shiny and very smooth, the remainder of the head densely reticulate-punctate. Anterior border of pronotum marginate, the pronotal sides bluntly marginate posteriorly but the sides broadly rounding into the dorsum anteriorly. Mesonotum not and propodeum only weakly laterally marginate. On the dorsum the mesonotum and propodeum separated only by a change of sculpture, without a transverse ridge or crest. In profile the metanotal groove absent, the propodeal teeth triangular and confluent with the conspicuous infradental lamellae. Sides of alitrunk unsculptured except for a few strong punctures anteriorly on the pronotum and feeble peripheral sculpture dorsally and posteriorly. Dorsal surfaces of pronotum and propodeum smooth and shiny, the mesonotum densely punctate. A pair of long fine subflagellate hairs present at the pronotal humeri, and another pair on the mesonotum; otherwise the dorsal alitrunk only with scattered fine hairs which are decumbent to appressed and directed approximately towards the midline. Spongiform appendages of pedicel segments conspicuously developed in profile. In dorsal view the petiole node much broader than long, with a pair of small lateral spongiform lobes connected across the posterior margin of the node by a vestigial lamellar strip. Postpetiole in dorsal view with a narrow lamella bordering the anterior margin, the lateral spongiform tissue broad behind but fading out anteriorly; the posterior margin only with a narrow transverse lamellar strip joining the two posterolateral spongiform masses. First gastral tergite basally with a narrow transverse strip of spongy lamellar tissue which is concave and interrupted medially. Dorsal surfaces of petiole and postpetiole smooth; first gastral tergite with basal costulae dense

on each side of a median strip where they are short and sparse. Simple fine standing hairs present on dorsal surfaces of petiole, postpetiole and first gastral tergite together with shorter sparse decumbent to appressed simple hairs. Colour brown.

Known only from the holotype worker, the Malawian *loveridgei* is closest related to the West African *sistrurus* and *crypturus*. In the worker they are quickly separated by the following characters.

<i>loveridgei</i>	<i>sistrurus</i> and <i>crypturus</i>
Mandibles with 3 apical denticles sharing a common base.	Mandibles with 2 apical denticles sharing a common base.
Mesonotum densely punctate.	Mesonotum mostly or wholly smooth.
Petiole node dorsally much broader than long, the surface smooth.	Petiole node dorsally only marginally broader than long, the surface sculptured.
Disc of postpetiole in dorsal view with thick spongiform material posterolaterally, fading out to nothing anteriorly.	Disc of postpetiole in dorsal view with thick spongiform material visible all along the sides.
Basal transverse lamellate strip of first gastral tergite narrow and interrupted medially.	Basal transverse lamellate strip of first gastral tergite broad, shallowly concave medially but not interrupted.

MATERIAL EXAMINED

Malawi: Nyika Plateau, above Nchenachena (*A. Loveridge*).

Glamyromyrmex sistrurus sp. n.

(Fig. 24)

HOLOTYPE WORKER. TL 2.0, HL 0.50, HW 0.35, CI 70, ML 0.10, MI 20, SL 0.20, SI 57, PW 0.23, AL 0.52.

Mandible with a principal dental row of 6 enlarged teeth. Basal tooth of mandible slightly smaller than the second, following the basal lamella without a diastema. (The basal lamella partially visible as mandibles are not fully closed.) Second tooth distinctly smaller than the third and the third noticeably smaller than the fourth and fifth teeth which are the largest. Sixth tooth about the same size as the third, followed apically by a pair of denticles which share a common base. In profile the upper and lower mandibular margins divergent from base to apex, the apical (masticatory) margin a strongly downcurved arch but the mandibular dorsal border not upcurved so that it overlaps the level of the anterior clypeal margin. Anterior clypeal margin extremely shallowly concave, almost transverse in full-face view. Upper scrobe margins diverging evenly behind the relatively narrow frontal lobes, not strongly expanded, the preocular laminae just visible in full-face view. Sides of occipital lobes evenly shallowly convex behind the level of the scrobes, rounding to the occipital margin which is shallowly concave and lacks strongly prominent posteriorly projecting lobes. Eyes small, of about 10 ommatidia, situated on the ventral scrobe margin. Antennal scapes weakly clavate, broadest at about the midlength, with the leading edge shallowly convex and equipped with a number of very narrowly spatulate hairs which are subdecumbent to decumbent and directed towards the apex of the scape. Clypeal dorsum densely clothed with short spatulate appressed hairs. Behind the clypeus the hairs more narrowly spatulate and posteriorly becoming gradually even narrower so that by the level of the eye the hairs are simple. All cephalic hairs behind the clypeus are strongly arched forwards and subdecumbent to decumbent. Three pairs of long flagellate hairs present; one pair dorsally close to the occipital margin, one pair at the occipital corners and one pair at the apices of the scrobes. Clypeus smooth and highly polished, remainder of cephalic dorsum strongly reticulate-punctate. Pronotum marginate anteriorly but not laterally. Mesonotum and propodeum marginate laterally, the latter more sharply so than the former, the two areas not separated by a ridge or crest across the dorsum. In profile the dorsal alitrunk convex in outline, highest at the mesonotum and without trace of a metanotal groove, the mesonotum and propodeum forming an even shallow convexity. Propodeum with the teeth incorporated in the infradental lamella. Sides of alitrunk unsculptured except for anterior part of pronotum and some very weak peripheral vestiges. Pronotum and propodeum smooth dorsally, the mesonotum mostly smooth but with faint scattered punctures. Pronotum and mesonotum each with a pair of flagellate hairs. Otherwise dorsal alitrunk only with sparse simple hairs of varying length which arch across the dorsum or curve towards the midline and are subdecumbent to decumbent. Spongiform appendages of pedicel segments massively developed in profile. Petiole node rugulose on the

sides and dorsum, only very slightly broader than long in dorsal view and equipped with strongly prominent lateral spongiform appendages which are linked posteriorly by a broad lamina running across the posterior face of the node. Postpetiole smooth and shining, completely surrounded by spongiform tissue which is laminar anteriorly and posteriorly, thickest posterolaterally and narrowest medially. Base of first gastral tergite with a broad strongly ridged transverse band of lamellar spongiform material which has its anterior margin shallowly concave behind the posteromedian margin of the postpetiole. First gastral tergite with short basal costulae. Dorsal surfaces of petiole, postpetiole and first gastral tergite with simple fine hairs, some of those on the petiole subflagellate and others strongly back-curved. Colour black to blackish brown.

PARATYPE WORKERS. TL 1.9–2.0, HL 0.49–0.53, HW 0.34–0.36, CI 67–70, ML 0.10–0.11, MI 19–21, SL 0.18–0.21, SI 53–58, PW 0.22–0.25, AL 0.52–0.55 (11 measured).

As the holotype but the basal and second teeth on the mandible may be about the same size.

Holotype worker, **Cameroun**: Nkoemvon, 2.xi.1980, N49 (*D. Jackson*) (BMNH).

Paratypes. 11 workers with same data as holotype and 1 worker with same data but 6.x.1980, N34 (partially dissected to show mandibles) (BMNH; MCZ; MHN; ENSA).

Non-paratypic material examined. **Cameroun**: nr Yaounde (*G. Terron*).

The separation of *sistrurus* and its closest relative *crypturus* from *loveridgei* is tabulated under the last name. *G. sistrurus* differs from *crypturus* as follows.

<i>sistrurus</i>	<i>crypturus</i>
Mandible with 6 enlarged teeth, the basalmost following the lamella without a diastema.	Mandible with 5 enlarged teeth, with a short diastema between the basalmost tooth and the lamella.
Basal tooth of mandible not followed by a long broadly spatulate medially projecting hair before the basal lamella.	Basal tooth of mandible followed by a long broadly spatulate medially projecting hair before the basal lamella.
Lateral margins of clypeus more or less parallel anterior to the frontal lobes; clypeus narrower (Fig. 24).	Lateral margins of clypeus divergent anterior to the frontal lobes; clypeus broader (Fig. 23).
Appressed spatulate hairs on clypeus relatively large, as long as or longer than the basalmost tooth of the mandible.	Appressed scale-like hairs on clypeus minute, conspicuously shorter than the basalmost tooth of the mandible.
Arched cephalic hairs at highest point of vertex simple.	Arched cephalic hairs at highest point of vertex narrowly spatulate.

The *ravidurus*-group

(Fig. 28)

Outline shape of head as Fig. 28. Mandibles with 11 teeth, the principal dental row of 6 teeth (counting from the basalmost) is followed by 2 slightly smaller teeth and an apical series of 3 denticles which share a common base. Anterior clypeal margin weakly impressed medially. Lateral clypeal margins not expanded into a convex lobe on each side, the outer margins of the mandibles at full closure intersecting the anterior clypeal margin at the anterolateral corners. Head not dorsoventrally flattened and without a posteromedian broad tumulus. Posteriorly projecting rounded occipital lobes present. Pronotum not marginate laterally, the dorsum shallowly convex. Cephalic sculpture behind the clypeus reticulate-punctate to granular, partially concealed by the pilosity. Clypeus with scale-like appressed hairs. Flagellate hairs absent.

The single species included in this group, *ravidurus* from Cameroun, combines the general appearance of the members of the *loveridgei*-group with a more generalized mandible (11 teeth as opposed to a maximum of 8 in *loveridgei* and allies), a more specialized pilosity involving the loss of flagellate hairs and development of uniform appressed scale-like hairs all over the head, and the presence of broad rounded posteriorly projecting occipital lobes. The high dental count is the same as that noted in the *thuvidus*-group but in the latter the mandibles are by no means as strikingly arched-downcurved as in *ravidurus* and the head lacks rounded occipital lobes.

Glamyromyrmex ravidurus sp. n.

(Fig. 28)

HOLOTYPE WORKER. TL 2.1, HL 0.54, HW 0.41, CI 76, ML 0.11, MI 20, SL 0.22, SI 54, PW 0.24, AL 0.58.

Mandible with 11 teeth following the basal lamella without a diastema, the dentition consisting of a basal series of 6 relatively large teeth followed distally by 2 slightly smaller teeth and an apical series of three denticles which share a common base (from a paratype with open mandibles). Masticatory margin obscured in dorsal view by the numerous scale-like hairs arising from the blade which project medially over the teeth. In profile the mandibles strongly arched-downcurved, the upper margin strongly curved and its highest point above the level of the anterior clypeal margin. Median portion of clypeal dorsum depressed and more or less flat, the lateral margins weakly elevated. Anterior clypeal margin very feebly indented medially, almost transverse, the lateral portions of the anterior margin slightly elevated. In full-face view the sides of the head behind the level of the antennal insertions evenly divergent to the apices of the scrobes then passing through an obtuse angle and gradually converging occipitally. Rounded posteriorly projecting occipital lobes present. Mandibles, clypeus, entire cephalic dorsum and antennal segments all with numerous conspicuous appressed scale-like hairs, without other pilosity of any description. Lateral margins of head without flagellate hairs. With head in profile the eyes very small, with only 4-5 ommatidia. Scale-like hairs present on the sides of the head behind the deep scrobes and on the preocular laminae and the lateral portion of the clypeus in front of the antennal insertions. Clypeus superficially and very faintly reticulate, the cephalic dorsum weakly reticulate-granular between the scale-like hairs. Antennal scapes weakly clavate in full-face view, broadest close to the midlength and their leading edges equipped with a series of appressed scale-like hairs which lie almost nose-to-tail, the apex of one hair nearly touching the base of the next. Pronotum marginate anteriorly but not marginate laterally. Mesonotum not marginate but the short propodeum laterally angulate between sides and dorsum; the dorsum broader than long. Metanotal groove not impressed but present across the dorsal alitrunk as a narrow transverse line. In profile the dorsal alitrunk outline more or less evenly convex, highest at about the mesonotal midlength. Propodeal teeth short, upcurved at the extreme apex, confluent ventrally with the broad infradental lamellae, the latter with their free margins more or less vertical, not evenly concave. Sides of alitrunk unsculptured, with scattered scale-like hairs on sides of pronotum. Dorsum of promesonotum with superficial faint reticular patterning and scattered appressed scale-like hairs which are similar to those on the head but narrower and in general more widely spaced. Propodeal dorsum smooth and without scale-like hairs. Flagellate hairs absent from alitrunk, without pilosity of any description other than the scale-like hairs. Pedicel segments in profile with spongiform appendages enormously developed. Petiole with ventral appendage forming a deep narrow lobe anteriorly but in its posterior half the spongiform tissue is much expanded laterally so that it is clearly visible in dorsal view. Ventral spongiform appendage of postpetiole massive and base of first gastral sternite with a well-developed spongiform pad. Petiole node in dorsal view approximately as broad as long, with a broad lamellate posterior strip. Disc of postpetiole surrounded on all sides by lamellar or spongiform material, the disc broadest in front of the midlength, the sides convergent posteriorly and the posterior margin not indented medially. Base of first gastral tergite with a lamellate spongiform strip which is traversed by the basigastral costulae, the latter very short and scarcely extending onto the tergite proper. Petiole, postpetiole and gaster unsculptured, the only pilosity present on all these surfaces being appressed scale-like hairs. Posterior margins of petiole and postpetiole with a series of large scale-like hairs which overlap the lamellar strips, these hairs much larger than those on the dorsal surfaces of the petiole and postpetiole. Colour dark brown.

PARATYPE WORKER. TL 2.1, HL 0.56, HW 0.43, CI 77, ML 0.12, MI 21, SL 0.22, SI 51, PW 0.25, AL 0.60. As holotype.

Holotype worker, **Cameroun**: nr Yaounde, sample SQ (*G. Terron*) (ENSA).Paratypes. 1 worker, nr Yaounde, sample SV (*G. Terron*); 1 worker, nr Yaounde, sample YM (*G. Terron*) (BMNH; ENSA).

The combination of characters noted in the species-group diagnosis quickly separates *ravidurus* from all its Afrotropical congeners. The scale-like hairs on the head and body are very conspicuous and at first sight are the most obvious feature of this species. Only one other African species in the genus is similarly covered with scale-like hairs, *tukultus*, although several have appressed scale-like hairs on the clypeal dorsum alone.

The *thuvidus*-group

(Figs 29, 31)

Outline shape of head as Fig. 29. Mandibles with 11 teeth, the principal dental row containing 8 teeth of about the same size, not strikingly enlarged but larger than the three apical denticles. Mandibles not as strongly arched-downcurved as in preceding groups. Anterior clypeal margin transverse. Lateral clypeal margins not expanded into a convex lobe on each side, the outer margins of the mandibles at full closure intersecting the anterior clypeal margin at the anterolateral corners. Head not dorsoventrally flattened and without a dorsal posteromedian broad tumulus. Posteriorly projecting rounded occipital lobes absent. Pronotum not sharply marginate laterally, the dorsum transversely flat to shallowly convex. Cephalic sculpture behind the clypeus either finely granular or with coarse foveolate punctures. Clypeus usually with scale-like to spatulate hairs which are appressed, but with elevated pilosity in *trymalus*.

The three species included in this group, *thuvidus* from Kenya, *tukultus* from Ivory Coast and *trymalus* from Cameroun, are those members of *Glamyromyrmex* in Africa which seem closest to *Smithistruma*. At the start of this survey I was undecided about the correct generic assignment for these three species but, considering the appearance of the mandibles in profile (Fig. 31), I decided that *Glamyromyrmex* was the best generic fit that could be achieved at present. With the revision of the short mandibulate dacetines of the world at generic level the position of these species may change.

Although sharing the characters listed above two of the three species included here have radically different sculpture and pilosity from the third, which may not be closely related. In *tukultus* the mandibles and the entire cephalic dorsum are blanketed by appressed scale-like hairs, which partially conceal the underlying fine dense reticulate-punctate sculpture of the head. In contrast, *thuvidus* and *trymalus* lack this coat of scale-like hairs and have the cephalic dorsum coarsely foveolate, the foveolae being so strongly developed that the head has a cratered appearance.

***Glamyromyrmex thuvidus* sp. n.**

(Fig. 31)

HOLOTYPE WORKER. TL 1.6, HL 0.43, HW 0.29, CI 67, ML 0.08, MI 19, SL 0.19, SI 66, PW 0.21, AL 0.41.

On the mandible the first tooth following the basal lamella small, about half the size of the second tooth. Remaining teeth of the principal dental row showing some slight variation in size but none radically reduced. In profile the upper and lower mandibular margins diverging from base to apex, the upper margin weakly elevated anteriorly above the level of the anterior clypeal margin; the apical (masticatory) margin arched-downcurved. Anterior clypeal margin transverse, the lateral margins not expanded, converging behind to the convex frontal lobes, the width across which, from side to side, is only slightly less than the maximum width of the clypeus. Upper scrobe margins distinctly indented behind the frontal lobes, convex and divergent posteriorly. Occipital margin shallowly concave. Eyes vestigial, consisting of only one or two ommatidia, situated on the ventral scrobe margins and the diameter of the eye less than that of the foveolate punctures which occur on the side of the head behind the scrobe. Antennal scapes very weakly clavate, the leading edges gently convex and with apically directed fine curved short hairs. Clypeus with closely appressed short spatulate to scale-like hairs. Behind the clypeus the cephalic dorsum with fine standing hairs which are arched or curved, mostly directed towards the midline; posteriorly some of the arched hairs are directed forwards. Behind the clypeus the curved hairs are narrowly spatulate, more posteriorly they are simple but some are minutely bifurcated at the apex. Sides of head with 4 pairs of laterally projecting long flagellate hairs, the occipital margin with another pair towards the outer edges but these tend to be directed upwards. Clypeus smooth and shining. Central strip of cephalic dorsum from between the frontal lobes approximately to the highest point of the vertex mostly smooth, with a few extremely minute fine regular vestiges which are very indistinct. Dorsum behind and on each side of this area with broad coarse foveolate punctures which give the surface a cratered appearance. The head shiny and smooth between the punctures. Anterior border of pronotum marginate, the sides rounded and not marginate. Sides of mesonotum and propodeum weakly marginate, the two confluent dorsally, not separated by a transverse ridge or crest and the metanotal groove absent. Propodeal teeth mostly incorporated in the infradental lamellae, with just a minute point projecting. Sides of alitrunk smooth except for a few foveolate punctures anteriorly on the pronotum. Dorsal alitrunk smooth and shining everywhere, devoid of sculpture. Pronotum at the humeri with a pair of laterally directed long flagellate

hairs, the dorsum with two vertically directed pairs, one situated anteriorly and the other posteriorly. Mesonotum with a single flagellate pair directed vertically. Otherwise the dorsal alitrunk only with scattered fine hairs which arch towards the midline, some of these hairs minutely bifurcate apically. With the pedicel segments in profile the ventral petiolar appendage reduced to an anteriorly situated broad lobe beneath the peduncle, the lobe petering out about on a level with the highest point of the node. Lateral and ventral appendages of postpetiole large but delicate and blister-like, translucent and with minute weak veins present. Petiole in dorsal view with the node transverse, much broader than long, smooth and shining. Lateral spongiform appendages vestigial, reduced to a minute and scarcely visible strip on each side, without a transverse lamella connecting them across the posterior face of the node. Postpetiole in dorsal view smooth and shining, the blister-like appendages prominent on each side and the anteriormost parts of the ventral appendage visible, projecting in front of the anterior margin of the lateral appendage on each side. Anterior and posterior margins of postpetiolar disc bordered by a narrow lamella, the disc itself roughly trapezoidal in shape, narrowing posteriorly and with broadly rounded anterolateral corners, the anterior margin deeply concave. Base of first gastral tergite lamellar, the lamella deeply concave and almost interrupted medially. Basigastral costulae arise on each side of this concavity. Dorsal surfaces of petiole, postpetiole and first gastral tergite each with scattered fine simple hairs which are mostly erect to suberect. Colour glossy dull yellow.

PARATYPE WORKER. TL 1.6, HL 0.44, HW 0.29, CI 66, ML 0.09, MI 20, SL 0.20, SI 69, PW 0.22, AL 0.43. As holotype.

Holotype worker, **Kenya**: Embu, Kirimiri Forest, W. of Runyenje, 1550 m, 3.x.1977 (V. Mahnert & J.-L. Perret) (MHN).

Paratype. 1 worker with same data as holotype (BMNH).

G. thuvidus and *trymalus* are closely related and together are separated from *tukultus* as tabulated below. Differences between *thuvidus* and *trymalus* are given under the latter.

<i>thuvidus</i> and <i>trymalus</i>	<i>tukultus</i>
Mandibles not clothed in scale-like hairs.	Mandible clothed in scale-like hairs.
Cephalic dorsum behind clypeus with arched simple hairs, and with flagellate hairs present (5 pairs).	Cephalic dorsum behind clypeus with appressed scale-like hairs; flagellate hairs absent.
Sides of pronotum with a few anteriorly situated foveolate punctures.	Sides of pronotum unsculptured.
Ventral appendage of petiole lobiform, not running the length of the segment.	Ventral appendage of petiole massively spongiform, running the length of segment.
Petiole node much broader than long in dorsal view, the posterior margin without a transverse bordering lamella.	Petiole node about as broad as long in dorsal view, the posterior margin with a broad transverse bordering lamella.
Anterior margin of postpetiolar disc concave in dorsal view.	Anterior margin of postpetiolar disc transverse in dorsal view.

Glamyromyrmex trymalus sp. n.

HOLOTYPE WORKER. TL 1.7, HL 0.43, HW 0.30, CI 70, ML 0.10, MI 23, (antennae lost), PW 0.22, AL 0.44.

Extremely closely related to *thuvidus* and answering to the description given for that species. In particular, *trymalus* shows the same highly characteristic cephalic sculpture as *thuvidus*, having numerous broad foveolate punctures with smooth spaces between them so that the head appears cratered. This very distinctive sculpture coupled with minute size, yellow colour, and the characters noted in the species-group diagnosis serve to isolate *thuvidus* and *trymalus* from all other Afrotropical *Glamyromyrmex*. The two are separated as follows.

<i>thuvidus</i>	<i>trymalus</i>
Clypeal dorsum with appressed short scale-like to spatulate hairs.	Clypeal dorsum without appressed hairs of any description.

thuvidus – cont.

Elevated relatively long hairs absent from clypeal dorsum.
 Lateral and ventral appendages of postpetiole delicate and blister-like, translucent and with minute veins present.
 With postpetiole in dorsal view the anterior margin of the disc broadly and deeply concave.
 Basalmost tooth of mandible only half the size of the second tooth from the base.

trymalus – cont.

Elevated relatively long hairs present on clypeal dorsum.
 Lateral and ventral appendages of postpetiole conspicuously spongiform.
 With postpetiole in dorsal view the anterior margin of the disc evenly shallowly concave.
 Basalmost tooth of mandible only very slightly smaller than the second tooth from the base.

Holotype worker, **Cameroun**: nr Yaounde, sample AAU (*G. Terron*) (ENSA).

***Glamyromyrmex tukultus* sp. n.**

(Fig. 29)

HOLOTYPE WORKER. TL 1.6, HL 0.41, HW 0.29, CI 71, ML 0.10, MI 24, SL 0.16, SI 55, PW 0.20, AL 0.44.

Mandibles covered in small scale-like appressed hairs. Basalmost tooth following the basal lamella without a diastema, slightly smaller than the second tooth; all teeth after the second approximately the same size except teeth nine and ten which are much reduced. There is a tendency for alternating slightly smaller and slightly larger teeth in the principal dental row. In profile the mandibles broadening from base to apex, the upper margin not conspicuously raised above the level of the anterior clypeal margin and with a plateau-like slightly convex outline before arching steeply downwards. Anterior clypeal margin transverse. Frontal lobes not distinctly convex, their margins more or less parallel, the width across the frontal lobes from edge to edge conspicuously less than the maximum width of the clypeus; the preocular laminae plainly visible in full-face view. Sides of head behind the frontal lobes shallowly convex and divergent. Occipital margin evenly concave. Eyes small, situated on the ventral margin of the short but deep antennal scrobe. Antennal scapes in full-face view with the leading edges moderately convex but distinctly indented near the base, without projecting hairs but equipped with appressed small scale-like hairs which are also present on the funicular segments. Clypeus and entire dorsum of head densely clothed with appressed scale-like hairs which are directed anteriorly, the hairs situated more posteriorly on the head narrower and more spatulate than those sited further forwards. Head without other pilosity of any description. Clypeus smooth, the cephalic dorsum behind the clypeus finely reticulate-punctate but the sculpture largely concealed by the pilosity. Anterior pronotal border marginate, the sides not marginate. Sides of mesonotum extremely feebly marginate and sides of propodeum slightly more strongly so, the two segments confluent on the dorsum, not separated by a transverse ridge or crest; the metanotal groove absent. Propodeal teeth entirely incorporated in the infradental lamellae. Sides of alitrunk unsculptured and shining. Dorsal alitrunk smooth and shining everywhere. Pronotum with three pairs of short erect simple hairs, one pair at the humeri, one pair anterodorsally and another posterodorsally; mesonotum with a single pair of short erect hairs. Apart from these the dorsal alitrunk with decumbent to appressed small hairs which are directed towards the midline; those on the pronotum narrowly spatulate. In profile the spongiform appendages of the pedicel segments massively developed, the petiolar ventral appendage running the length of the segment, finely and densely spongiform and almost as deep as the maximum height of the node. Lateral and ventral postpetiolar appendages thick and the basisternal pad on the gaster conspicuous. Petiole node in dorsal view smooth, about as long as broad and with sharply defined anterior and posterior borders. Lamellate appendage of node continuous across the posterior margin. Disc of postpetiole smooth and shining, much broader than long and thickly surrounded at the sides by dense spongiform tissue, a lobe of which projects strongly forwards from below the disc on each side of the petiole-postpetiole junction. Anterior border of postpetiolar disc with a narrow lamellate margin. Base of first gastral tergite with a thick costulate-spongiform transverse strip, the anterior margin of which is very feebly concave medially. Basigastral costulae mostly confined to this strip, only feebly encroaching onto the tergite proper at the sides. Petiole, postpetiole and gaster with fine simple hairs, the first also with a few narrowly spatulate reclinate hairs. Colour glossy dull yellow.

PARATYPE WORKERS. TL 1.6, HL 0.42, HW 0.29–0.30, CI 69–71, ML 0.10, MI 24, SL 0.16–0.17, SI 55–59, PW 0.20, AL 0.44 (3 measured).

As holotype but infradental lamellae may have a point developed apically.

Holotype worker, **Ivory Coast**: Bingerville, 29.x.1980 (V. Mahnert & J.-L. Perret) (MHN).

Paratypes. 3 workers with same data as holotype (MHN; BMNH; MCZ).

Closest related to *thuvidus*, differences separating the species are tabulated under that name. The most obvious character separating *tukultus* from all other members of the genus except *ravidurus* is the dense covering of scale-like hairs everywhere on the head and its appendages. *G. ravidurus* is a much larger darker species than *tukultus* and the characters given in their respective species-group diagnoses will differentiate the two.

***SERRASTRUMA* Brown**

(Figs 34–44)

Serrastruma Brown, 1948: 107 [as subgenus of *Smithistruma*]. Type-species: *Strumigenys simoni* Emery, 1895a: 42, pl. 2, fig. 21, by original designation.

Serrastruma Brown; Brown, 1949a: 6. [Raised to genus.]

DIAGNOSIS OF WORKER. Afrotropical dacetine ants. Mandibles elongate-triangular (MI 26–50), serially finely and densely denticulate along the entire masticatory margin, with >20 denticles; without an apical fork of spiniform teeth. Mandibular denticles either uniformly small or with the basal 4–8 enlarged, commonly the basalmost denticles enlarged in either case. Mandibles lacking a differentiated prominent basal lamella and shallowly curved in profile. Antennae with 6 segments.

All 11 presently recognized species of *Serrastruma* are found in sub-Saharan Africa. Most are restricted to that region but a couple of species (*ludovici* and *simoni*) have successfully invaded the Malagasy region. Three species (*lujae*, *serrula* and *maynei*) have been found on the islands in the Gulf of Guinea. All nest in rotten wood, in the leaf litter or topsoil layer, or in the stumps of trees. Foraging is mainly conducted in the leaf litter or topsoil layers but individuals may ascend bushes and trees to a height of a metre or more, and *maynei* may form nests in trunks some distance above the ground. The predatory behaviour of *S. serrula* has been investigated in some detail by Dejean (1980a; 1980b).

The genus *Serrastruma* has its origins in *Smithistruma*, being derived and differentiated from that genus by the specialized form of the mandibles in *Serrastruma*. Brown (1952a: 71) has postulated an origin for *Serrastruma* in the *Smithistruma alberti*-group or *capitata*-group and maintains that the elongate basal lamella of the mandible seen in these groups has in *Serrastruma* become denticulate all along its inner free margin and has been pressed into service as part of the masticatory surface, the original smithistrumiform dentition being represented only by the apical group of denticles in *Serrastruma* and most of the length of the mandible being represented by this secondary development. This explanation effectively accounts for the mandibular form and dentition seen in *Serrastruma* and also accounts for the lack of a differentiated basal lamella in the genus, the presence of which is characteristic of *Smithistruma* and all its close relatives. The differences in mandibular form between *Serrastruma* and *Smithistruma* in the Afrotropical fauna may be tabulated as follows.

<i>Serrastruma</i>	<i>Smithistruma</i>
Mandibles elongate triangular, relatively long, MI 26–50.	Mandibles triangular to subtriangular, relatively short, MI 7–20.
Mandibles without a differentiated projecting basal lamella.	Mandibles with a differentiated projecting basal lamella (usually concealed by clypeus when closed).
Masticatory margin of mandible with >20 (usually at least 30) fine small denticles, sometimes with the basal 4–8 enlarged, often with the basalmost enlarged.	Masticatory margin of mandibles usually with 12 teeth or denticles, in one species with 16–17, the basal 5–7 of which form the principal dental row.

Serrastruma – cont.

Base of mandibles not extensively overlapped by the clypeus in full-face view, the latter with a false anterior margin above the true margin.

Smithistruma – cont.

Base of mandibles extensively overlapped by the clypeus in full-face view, the latter lacking a false anterior margin above the true margin.

Historically *Serrastruma* dates back only to 1948 when Brown first defined the group as a subgenus of *Smithistruma*. Prior to that date the members of *Serrastruma* had been treated either as belonging to *Strumigenys* (Arnold, 1917) or grouped together with *Smithistruma* in a subgenus of *Strumigenys* called *Cephaloxys* (Wheeler, 1922). Brown (1948) showed that several disparate groups were included in *Strumigenys*. He erected the genus *Smithistruma* to hold most of the short-mandibulate forms previously included in *Strumigenys* (the name *Cephaloxys* being preoccupied) and treated *Serrastruma* as a subgenus of *Smithistruma*. The next year Brown (1949a) recognized that *Serrastruma* and *Smithistruma* had differently constructed mandibles and raised the former name to full generic status.

Subsequently Brown (1952a) issued an extensive revision of *Serrastruma* which cut down the 27 named forms then in the genus to seven recognized species plus two species inquirendae. Since the publication of this revision much type-material unobtainable by Brown has become available for study, along with a great many more samples of *Serrastruma*, all of which has greatly facilitated the present investigation. Fundamentally Brown's treatment of the genus remains unchanged except for the addition of five new species and a reinterpretation of a few names, most of these belonging to forms where the type-series was not available to Brown while conducting his survey. The changes from his revision are summarized as follows. Brown's (1952a: 85) species inquirendae included the names *ludovici* and *calypso*. The types of these were not available for his study but he speculated that *ludovici* was the senior synonym of *alluaudi*. Brown has informed me that he confirmed this synonymy some time ago and my examination of the types agrees with his conclusion. As for *calypso*, Brown supposed it might be synonymous with *lotti*. However, an examination of the holotype, which was not available for study at the time of Brown's revision, shows it to be a straight synonym of *lujae*.

S. lotti and *bequaerti*, treated by Brown (1952a: 76, 80) as valid species, are now included as synonyms of *ludovici* and *lujae* respectively. Some time ago Brown informed me that he had recognized both these synonyms, and I have merely confirmed them here.

S. alluaudi st. *nigeriensis* was given by Brown (1952a: 83) as a synonym of *simoni* but a re-examination of the mandibles of the syntype-series has revealed the characteristic dentition of *ludovici*, and *nigeriensis* has now been referred to the synonymy of *ludovici*.

Brown (1952a: 75) recognized that the type-series of *raymondi* was a mixture of *alluaudi* (now *ludovici*) and *simoni*, and synonymized *raymondi* under the former name. However, the specimen labelled as holotype by Donisthorpe, the author of *raymondi*, is plainly a specimen of *simoni*, and *raymondi* is therefore transferred to the synonymy of that species.

Finally *concolor* is removed from the synonymy of *serrula* and reinstated as a valid species, for reasons given in the discussion of *concolor*, below.

In terms of number of species *Serrastruma* falls well behind *Smithistruma* and *Strumigenys*, but in terms of numbers of individuals and the range of distribution of the species *Serrastruma* far outstrips the rest. Its species are easily the most successful dacetine ants in sub-Saharan Africa and in terms of number of samples encountered in collections *Serrastruma* material amounts to more than that of all the other genera combined. It is this commonness, coupled with an innate tendency of the most widely distributed species to show variation in sculpture and size, which has been mostly responsible for the extensive synonymy.

List of Afrotropical *Serrastruma*

concolor (Santschi) sp. rev.

dotaja sp. n.

goterra sp. n.

inquilina sp. n.

***ludovici* (Forel)**

alluaudi Santschi syn. n.

alluaudi st. *nigeriensis* Santschi syn. n.

rothkirchi Wasmann

escherichi subsp. *lotti* Weber syn. n.

lujae (Forel)

reticulata Stitz
glanduscula Santschi
bequaerti Santschi **syn. n.**
gerardi Santschi
calypso Santschi **syn. n.**
aequalis Menozzi

maynei (Forel)

maynei var. *latiuscula* Forel

miccata sp. n.**serrula** (Santschi)

uelensis Santschi

simoni (Emery)

escherichi Forel
cognata Santschi
biconvexa Santschi
cognata st. *boerorum* Santschi
escherichi r. *limbata* Forel
escherichi var. *cliens* Forel
escherichi st. *cognata* var.
obscuriventris Santschi (unavailable)
escherichi st. *cognata* var.
fusciventris Santschi (unavailable)
raymondi Donisthorpe **syn. n.**

sulumana sp. n.**Key to species (workers)**

Note. The parasitic *S. inquilina*, known only from a series of females found in a nest of *lujae*, is omitted from the key.

- 1 With the head in full-face view the upper scrobe margin just behind the level of the eyes without a projecting long hair on each side 2
- With the head in full-face view the upper scrobe margin just behind the level of the eyes with a long flagellate or simple fine hair projecting on each side 5
- 2 Dorsal surfaces of head and alitrunk with very conspicuous dense thickly spatulate to scale-like coarse ground-pilosity (Figs 36, 37). Antennal scapes relatively short, SI 73–83 3
- Dorsal surfaces of head and alitrunk with inconspicuous slender very narrowly spatulate ground-pilosity. Antennal scapes relatively long, SI 116–127 4
- 3 Dorsal alitrunk sculptured. Sides of head not broadly convex posteriorly (Fig. 37). (Ivory Coast, Ghana, Nigeria, Cameroun, Annobon I., Zaire, Angola, Uganda, Tanzania) **maynei** (p. 347)
- Dorsal alitrunk glassy smooth. Sides of head broadly convex posteriorly (Fig. 36). (Cameroun) **geoterra** (p. 341)
- 4 Pronotal humeri each with a short stout clavate hair. Leading edges of scapes with projecting short clavate hairs. Mandibles shorter, MI 26, the basal 4–5 denticles suddenly and conspicuously enlarged. Metanotal groove not impressed. (Ghana) **miccata** (p. 348)
- Pronotal humeri each with a long fine flagellate hair. Leading edges of scapes with fine simple outcurved short hairs. Mandibles longer, MI 44–45, the basal 4–5 denticles not enlarged. Metanotal groove impressed. (Cameroun) **sulumana** (p. 352)
- 5 Principal sculpture of pronotal dorsum dense reticulate-punctuation, with or without overlying costulate or striate sculpture. When such overlying sculpture is present it is distinctly secondary to the dense punctate component 6
- Principal sculpture of pronotal dorsum consisting of longitudinal to oblique striae or costulae, or the surface mostly to entirely unsculptured and smooth; punctate sculpture usually absent but when present is very feeble and distinctly secondary to the striate or costulate component 9
- 6 With the head in full-face view the basal series of denticles on the mandible suddenly enlarged, broader longer and coarser than those preceding; usually this enlarged series very distinct (Fig. 34). (Extremely widespread in Afrotropical region, Madagascar, Mauritius) **ludovici** (part, p. 343)
- With the head in full-face view the basal series of denticles on the mandible not enlarged, the denticles approximately the same size throughout the length of the margin or very evenly and gradually increasing in size basally 7
- 7 Mesonotum with 3–4 pairs of short erect relatively slender hairs, the posteriormost pair situated at or close to the metanotal groove. Ground-pilosity of promesonotum strong, not reclinate, conspicuous in profile (Fig. 42). Punctate sculpture of head and alitrunk strong and sharply defined. (West and central Africa, São Tomé I.) **serrula** (p. 349)
- Mesonotum usually with a single pair of erect apically thickened to strongly clavate hairs which are situated anteriorly on the segment. Very rarely a second pair present but if so these are close to the first pair and remote from the metanotal groove. Ground-pilosity of promesonotum feeble, mostly or entirely reclinate, inconspicuous in profile (Figs 43, 44). Punctate sculpture on head and alitrunk usually fine 8

- 8 Dorsum of head behind highest point of vertex with 4 relatively slender simple standing hairs and with a further pair situated in front of the highest point of the vertex. With the head in full-face view the upper scrobe margins not indented at the site of the projecting hair. Postpetiole with more than one pair of standing hairs. (Extremely widespread in Afro-tropical region)..... *lujae* (p. 345)
- Dorsum of head behind highest point of vertex with 2–4 thickened apically clavate standing hairs; without standing pilosity in front of the highest point of the vertex. With the head in full-face view the upper scrobe margins usually conspicuously indented at the site of the projecting hair. Postpetiole with only a single pair of standing hairs. (West and Central Africa, Uganda)..... *concolor* (p. 338)
- 9 Pronotum (at the humeri) and mesonotum each with a pair of exceptionally long fine flagellate hairs (Fig. 38). First gastral tergite with only a single pair of long simple hairs, which are not thickened or clavate apically and are situated close to the base of the sclerite. (Cameroun, Gabon)..... *dotaja* (p. 339)
- Pronotum (at the humeri) with flagellate hairs but mesonotum never with such hairs. Usually the mesonotum with a single pair (very rarely 2 pairs) of stout hairs which are thickened or clavate apically (Figs 40, 41). First gastral tergite with hairs present which are thickened or clavate apically..... 10
- 10 Basal series of mandibular denticles suddenly and conspicuously enlarged (Fig. 34). With postpetiole in profile the area of the ventral spongiform lobe less than that of the exposed portion of the postpetiolar disc (Fig. 41). (Extremely widespread in Afrotropical region, Madagascar, Mauritius)..... *ludovici* (part, p. 343)
- Mandibular denticles small fine and regular to base. With postpetiole in profile the area of the ventral spongiform lobe distinctly greater than that of the exposed portion of the postpetiolar disc (Fig. 40). (Eastern and southern Africa, Nigeria, Mauritius)..... *simoni* (p. 350)

Serrastruma concolor (Santschi) sp. rev.

(Fig. 43)

Strumigenys (*Trichoscapa*) *concolor* Santschi, 1914b: 375. Syntype workers, female, GHANA: Aburi (NMB) [examined]. [Previously synonymized with *serrula* by Brown, 1952a: 81.]

WORKER. TL 2.0–2.2, HL 0.48–0.52. HW 0.40–0.46, CI 80–90, ML 0.16–0.18, MI 32–36, SL 0.30–0.33, SI 67–80, PW 0.28–0.32, AL 0.56–0.62 (12 measured).

Mandibular denticles evenly sized to the base, without a basal series of 4–8 denticles which are enlarged though the basalmost may be larger than those preceding. Upper scrobe margins well developed, with a flagellate hair at each side just behind the level of the eye and with the margin indented or impressed at the site of the hair. Width and depth of this indentation variable, usually conspicuous in full-face view but sometimes only shallow. Ground-pilosity of head short and narrowly spatulate, closely applied to the surface and indistinct. Dorsum of head behind highest point of vertex with 2 or 4 elongate standing hairs which are anteriorly curved, stout and narrowly clavate apically. Samples with only one pair of these hairs generally have the upper scrobe margins more strongly impressed at the site of the flagellate hair than do those samples with two pairs of hairs. Entire dorsum of head densely finely reticulate-punctate. Alitrunk in profile with promesonotum convex, sloping down posteriorly to the impressed metanotal groove. Propodeal dorsum convex, sloping behind to a pair of teeth which are variable in size. Infradental lamellae present on propodeal declivity. Sides of pronotum superficially punctulate to smooth, the pleurae usually smooth but in some their upper halves finely punctulate. Dorsal alitrunk finely reticulate-punctate everywhere but the intensity of sculpture on the pronotum variable and sometimes the punctures filled by a waxy superficial layer. Occasionally weak superficial rugulae, generally formed by alignment of puncture margins, may occur, but these are always distinctly secondary to the punctate sculpture. Pronotum with flagellate hairs present at the humeri. Mesonotum with a single anteriorly situated pair of standing hairs which are stout long conspicuous and clavate apically. Dorsal alitrunk otherwise only with sparse ground-pilosity which is short, inconspicuous and generally closely applied to the surface. Spongiform appendages of pedicel segments moderately developed in profile. Petiole in dorsal view usually punctate but the sculpture very faint in some specimens. Postpetiole usually superficially punctulate but almost smooth in some, with a posterior spongiform strip which abuts a similar narrow strip on the base of the first gastral tergite. Basigastral costulae present, the tergite otherwise unsculptured. Petiole and postpetiole dorsally each with a single pair of elongate stout hairs which are clavate apically, the first gastral tergite with numerous similar hairs. Colour yellow to yellowish brown.

This small species was earlier treated as a synonym of *serrula* by Brown (1952a: 81), but on examining the numerous series assigned to *serrula* it became apparent that two distinct species were in fact present. One of these matched the holotype of *serrula* (= *uelensis*) and the other the type-series of *concolor*, which is therefore returned to species rank. The two are separated by the following characters in the worker.

<i>concolor</i> (Fig. 43)	<i>serrula</i> (Fig. 42)
Mesonotum with a single anteriorly situated pair of elongate stout apically clavate standing hairs.	Mesonotum with 3 (rarely 4) pairs of more slender standing hairs which are weakly or scarcely clavate, the posteriormost pair the shortest and situated at the metanotal groove.
Petiole and postpetiole each with only a single pair of standing hairs.	Petiole usually and postpetiole always with more than one pair of standing hairs.
Ground-pilosity of head and alitrunk short sparse and inconspicuous, closely applied to the surface; the standing hairs on the cephalic dorsum very obviously longer and stouter than the ground-pilosity.	Ground-pilosity of head and alitrunk moderately long and dense, very conspicuous and elevated; the standing hairs on the cephalic dorsum only slightly longer and stouter than the ground-pilosity.
Alitrunk pleurae unsculptured at least on lower halves.	Alitrunk pleurae punctate but sometimes only superficially so.
Punctate sculpture of pronotal dorsum fine and not sharply defined.	Punctate sculpture of pronotal dorsum strong and sharply defined.

One other species is close to *concolor*, the common *lujae*, a species that shows a remarkable size range but whose diagnostic characters remain quite stable. *S. concolor* is persistently small, overlapping only the lower end of the range of *lujae*, and it differs by having 2–4 standing hairs posteriorly on the cephalic dorsum which are distinctly clavate apically, as opposed to the 6 fine hairs on the cephalic dorsum in *lujae* which are scarcely or not at all swollen apically. In *lujae* the 6 hairs are arranged in a posterior row of 4 and an anterior pair, situated just in front of the highest point of the vertex. The postpetiole in *concolor* always bears a single pair of stout hairs; in *lujae* two or more pairs occur.

I consider it possible that *concolor*, as presently constituted, may consist of two sibling species. It is noticeable that the samples with a single pair of standing cephalic hairs have the upper scrobe margins more strongly impressed at the site of the projecting hair than do those with two pairs of standing hairs. Whatever significance this may have cannot be investigated at the present time as not enough material of the two forms is available for comparison.

MATERIAL EXAMINED

Ivory Coast: Man (V. Mahnert & J.-L. Perret); Sassandra (I. Löbl). **Ghana:** Mampong (P. Room); Aburi. **Cameroun:** Mt Cameroun, Buea slope (B. Malkin); nr Yaounde (G. Terron). **Gabon:** Plateau d'Ipassa (J. A. Barra). **Zaire:** Ituri Forest, Beni Irumu (N. A. Weber); Ituri Forest, Epulu (T. Gregg); Niangara (N. A. Weber); Ruwenzori, Mwenda (J. C. Bradley). **Angola:** R. Camudembele (L. de Carvalho); R. Mussungue (L. de Carvalho); Dundo; Gubela (P. Hammond). **Chad:** Haut Mbomu (N. A. Weber). **Uganda:** Ft Portal (N. A. Weber).

Serrastruma dotaja sp. n.

(Figs 35, 38)

HOLOTYPE WORKER. TL 2.3, HL 0.53, HW 0.42, CI 79, ML 0.22, MI 42, SL 0.36, SI 86, PW 0.32, AL 0.62.

Mandibular denticles small even and regular, without a basal series of 4–8 enlarged denticles; only the basalmost denticle enlarged. Upper scrobe margins narrow and petering out posteriorly, not composed of a broad continuous lamellate granular flange; equipped just behind the level of the eye with an extremely long flagellate hair which basally projects laterally from the margin. Clypeus smooth on the disc, with appressed small spatulate hairs, the anteriormost row of spatulate hairs situated on the false margin of the clypeus and freely projecting forwards over the mandibular bases. Ground-pilosity of head to highest point of vertex consisting only of sparse narrow inconspicuous hairs which are decumbent to appressed and

directed anteriorly. Dorsum of head behind highest point of vertex with similar but slightly longer ground-pilosity and also with two pairs of anteriorly curved long simple hairs, one pair situated just behind the highest point and the other latero-occipitally. Dorsum and sides of head densely and strongly reticulate-punctate everywhere. Pronotum marginate anteriorly but laterally the sides of the alitrunk separated from the dorsum only by smoothly rounded blunt angles. In profile the pronotum and anterior part of the mesonotum forming an even shallow convexity, the posterior part of the mesonotum sloping down to the shallowly impressed metanotal groove. Propodeal dorsum curving down posteriorly to the bases of the strong propodeal teeth which are elevated and slightly upcurved. Infradental lamellae present down the depth of the propodeal declivity, its width equal to or slightly greater than the diameter of the propodeal spiracle. Sides of alitrunk glassy smooth, devoid of sculpture. Dorsal surfaces of pronotum, anterior mesonotum and propodeum glassy smooth. Posterior (sloping) portion of mesonotum smooth centrally but with some weak lateral punctulae and posteriorly with some irregular sculpture just in front of the metanotal groove. Propodeal declivity reticulate-punctate between the bases of the teeth. Pronotum and mesonotum each equipped with a pair of extremely long fine flagellate hairs, each hair arising from a small papilla. Dorsum of promesonotum otherwise only with very sparse short ground-pilosity which is subdecumbent. With the pedicel segments in profile the spongiform appendages well developed. Ventral petiolar process spongiform posteriorly but more solid and opaque anteriorly. Ventral and lateral spongiform lobes of postpetiole about equal in size, lateral appendage of petiole node smaller. In dorsal view both petiole and postpetiole smooth and very shiny, the former with a distinct spongiform strip running across the posterior face. Disc of postpetiole transversely roughly oval in dorsal view, the anterior face with a narrow transverse lamellate strip, the sides bordered with spongiform material which becomes broader posteriorly, and the posterior margin bordered with a broad spongiform strip the posterior margin of which is shallowly concave medially. Extreme base of first gastral tergite lamellate spongiform, with a continuous band of short basigastral costulae which do not run further back than the pair of long gastral hairs; remainder of tergite glassy smooth. Petiole and postpetiole each with a single pair of stout simple posteriorly curved long hairs. First gastral tergite with a single pair of simple hairs which are situated close to the base of the sclerite. Colour jet black, glossy behind the head, the appendages brown.

PARATYPE WORKERS. TL 2.3–2.5, HL 0.50–0.54, HW 0.41–0.43, CI 78–82, ML 0.20–0.23, MI 38–43, SL 0.34–0.37, SI 81–88, PW 0.31–0.34, AL 0.60–0.66 (20 measured).

As holotype but specimens from Gabon are slightly lighter in colour, blackish brown with somewhat lighter pedicel segments.

Holotype worker, **Cameroun**: Nkoemvon, 16.iii.1980 (*D. Jackson*) (BMNH).

Paratypes. **Cameroun**: 12 workers with same data as holotype; 3 workers with same data but 25.xi.1980, N52. **Gabon**: 11 workers, Plateau d'Ipassa, 6, IPA CI9 (*J. A. Barra*); 1 worker with same data but IV15, IPA 8 (BMNH; MCZ; MHN).

Non-paratypic material examined. **Cameroun**: nr Yaounde (*G. Terron*).

The presence of very long fine flagellate hairs on the mesonotum as well as on the pronotum immediately distinguishes *dotaja* from all other species as in those the mesonotum has one or more pairs of stout hairs which are thickened or clavate apically. The species *lujae*, *serrula*, *concolor* and *maynei* are also distinguished from *dotaja* by their possession of conspicuous pronotal sculpture, and *maynei*, *sulumana* and *geoterra* lack cephalic flagellate hairs. From *ludovici* samples in which the enlarged basal series of mandibular denticles is not very strongly developed *dotaja* differs in having the pleurae and propodeal dorsum smooth, as well as by having simple cephalic, petiolar, postpetiolar and gastral pilosity, all of which are clavate in *ludovici*. *S. simoni*, the closest relative of *dotaja*, is separated as follows.

dotaja (Fig. 38)

Standing hairs behind highest point of cephalic vertex simple.

Mesonotum with a pair of very long flagellate hairs similar to those on the pronotum.

Pilosity of petiole, postpetiole and gaster each of a single pair of simple curved hairs.

Pronotal dorsum glassy smooth.

simoni (Fig. 40)

Standing hairs behind highest point of cephalic vertex clavate.

Mesonotum with a pair of stout clavate hairs contrasting with the flagellate hairs on the pronotum.

Pilosity of petiole, postpetiole and gaster each of one or more pairs of clavate hairs.

Pronotal dorsum at least with scattered vestiges of sculpture.

dotaja (Fig. 38) – *cont.*

Dorsum of propodeum and of petiole node glassy smooth.

Disc of clypeus smooth (when clean).
MI 38–43; ML is 0.48–0.53×HW.

simoni (Fig. 40) – *cont.*

Dorsum of propodeum punctate, very very rarely with a smooth median area; petiole node punctate dorsally even if only feebly so.

Disc of clypeus sculptured (when clean).
MI 33–39; ML is 0.42–0.48×HW.

A single worker of *simoni* from Burundi (in MCZ) with very reduced sculpture is responsible for the qualifying 'at least' and 'very rarely' in the sculpture characters listed above. In this specimen the sculpture is more reduced than is usual in *simoni* and it is more like *dotaja* in this respect than any other sample examined. However, even in this individual the pilosity characters are absolutely those of *simoni*.

***Serrastruma geoterra* sp. n.**

(Fig. 36)

HOLOTYPE WORKER. TL 2.6, HL 0.58, HW 0.52, CI 90, ML 0.23, MI 40, SL 0.38, SI 73, PW 0.34, AL 0.74.

Mandibles with denticles very slightly enlarging basally, the increase in size minute and gradual, without a suddenly much enlarged basal series. False anterior margin of clypeus with a row of very conspicuous broad flattened hairs which project straight forwards over the real clypeal margin and the bases of the mandibles. Upper scrobe margins expanded into a very broad conspicuous lamella which runs the length of the scrobe, is slightly elevated and is of approximately equal width throughout its length. This upper scrobal lamella is so broad posteriorly that the eyes are concealed and not visible in full-face view; the margin without a pair of projecting long hairs just behind the level of the eyes. Antennal scapes feebly curved, broadened after the basal third and narrowing again apically, their leading edges with a projecting row of short broad flattened hairs which are truncated apically. Ground-pilosity of head consisting everywhere of very thick short blunt off-white to yellowish hairs which in profile can be seen to be dorsoventrally flattened and strongly curved anteriorly. Close to the occipital margin is a single pair of similarly constructed but longer, slightly more erect hairs. Eyes small, of 5–6 ommatidia. Clypeus with very feeble superficial reticular sculpture, a narrow strip behind the clypeus and following the shape of the posterior clypeal margin depressed and smooth. Behind this the head weakly reticulate-punctate, this sculpture fading posteriorly and the area between the highest point of the vertex and the occipital margin smooth except for the pits from which the hairs arise. Broad flange of upper scrobe margin densely reticulate-granular. Pronotum not marginate laterally, the humeri without flagellate hairs. Pronotum in dorsal view almost twice wider than the mesonotum, the two separated by a shallow arched-transverse impression. Metanotal groove represented by a transverse line across the dorsum but not impressed. With the alitrunk in profile the pronotal outline separated by a shallow impression from the mesonotum, the anterior half of the latter raised and on the same level as the pronotum. Behind this the mesonotum descending almost vertically and its posterior half flat or shallowly concave to the level of the metanotal groove, behind which the propodeal dorsum is shallowly convex and sloping posteriorly. Propodeal teeth triangular, with a narrow but conspicuous infradental lamella. Dorsum and sides of alitrunk glassy smooth everywhere, the propodeal declivity with reticular vestiges on its upper half. Pilosity of dorsal alitrunk as on head, the hairs curved anteriorly or medially on the pronotum and mesonotum, posteriorly on the propodeum. Mesonotum with a pair of similarly constructed but larger hairs at the point where the surface begins its sudden descent. Spongiform appendages of pedicel segments small, the subpetiolar process reduced to a thin strip and the subpostpetiolar lobe much smaller than the exposed area of the postpetiolar disc in profile. Dorsum of petiole node smooth but the peduncle and sides reticulate; posterior spongiform strip of node lamellate and narrow. Postpetiole smooth in dorsal view, posteriorly with a thin spongiform strip which abuts a similar thin strip on the base of the first gastral tergite. Basigastral costulae very short, no longer on the tergite than the width of basal spongiform strip; gaster otherwise smooth. Dorsal surfaces of petiole, postpetiole and gaster with ground-pilosity similar to that described for the head, and with paired longer more erect hairs which are thick, sturdy and broadly clavate. Colour glossy brown, the legs with dense scale-like decumbent to appressed pilosity.

PARATYPE WORKER. TL 2.7, HL 0.60, HW 0.54, CI 90, ML 0.23, MI 38, SL 0.40, SI 74, PW 0.37, AL 0.75. As holotype.

Holotype worker, **Cameroun**: nr Yaounde, sample 2513 (*G. Terron*) (ENSA).

Paratype. 1 worker with same data but sample TS (BMNH).

This very distinctive species appears closest related to *maynei*, the two having broad upper scrobe margins, conspicuous cephalic ground-pilosity, lacking flagellate hairs on the head and pronotum, lacking dense punctate pronotal sculpture, and having antennal scapes of moderate length. They are easily separated as *geoterra* has the alitrunk absolutely smooth whilst in *maynei* sculpture is present. Apart from this the alitrunk is characteristically shaped in *geoterra*, the cephalic pilosity is even broader and coarser than in *maynei*, and the sides of the head are conspicuously more convex because of the wide upper scrobe margin in *geoterra*, compare Figs 36, 37.

***Serrastruma inquilina* sp. n.**

HOLOTYPE FEMALE. TL 3.0, HL 0.65, HW 0.48, CI 74, ML 0.22, MI 34, SL 0.52, SI 108, PW 0.48, AL 0.80.

Mandibular denticles very gradually increasing in size towards base. Antennal scrobes vestigial, the upper scrobe margins not differentiated behind the level of the anterior margin of the eye; behind this point the dorsum of the head rounding into the sides. Flagellate hairs absent from the head. Clypeus glassy smooth, dorsum of head finely and densely punctate, the punctures superficial and the surface shining. Pilosity of head consisting entirely of fine simple curved hairs which are directed anteriorly except in the vicinity of the ocelli where they are directed approximately towards the mid-dorsal point. Dorsum of head without elongate standing specialized hairs. With the alitrunk in profile the propodeum unarmed, without trace of teeth. Sides of pronotum densely reticulate-punctate, the lateral portions of the mesoscutum, above the pronotum, more finely punctulate. Mesopleuron smooth except for the strip immediately below the wing insertion which is punctate. Metapleuron punctate in the upper half, smooth below. Sides of propodeum densely reticulate-punctate. Mesoscutum with a broad central smooth area but the periphery of the sclerite tending to be punctulate. Scutellum weakly punctulate, the propodeum densely reticulate-punctate. With the pedicel segments in profile spongiform appendages are absent from the petiole and very reduced on the postpetiole where they are represented only by a small lateral and ventral lobe. In dorsal view the petiole node smooth, as long as broad and lacking a transverse lamellar or spongiform strip posteriorly. Postpetiole slightly broader than long, smooth, and having a narrow lamellate strip traversing the posterior margin. First gastral tergite smooth, without trace of basal costulae. Pilosity everywhere on dorsal surfaces of alitrunk, petiole, postpetiole and gaster consisting of quite dense fine simple soft curved hairs which are subdecumbent to decumbent, pointed apically and directed approximately towards the midline on the alitrunk and posteriorly on the pedicel segments and the gaster; without long flagellate or any other specialized hairs. Colour yellow.

PARATYPE FEMALES. TL 2.9–3.1, HL 0.64–0.68, HW 0.46–0.48, CI 71–74, ML 0.20–0.22, MI 30–34, SL 0.50–0.52, SI 108–113, PW 0.46–0.48, AL 0.78–0.85 (7 measured).

As holotype, the petiole node in dorsal view may be fractionally longer than broad.

Holotype female (alate), **Zaire** ('B. Congo' on data label): S. slope of Mt Kahuzi, 1900 m, 5.ix.1957, in nest of *Serrastruma lujae* (Forel) (*E. S. Ross & R. E. Leech*) (CAS).

Paratypes. 7 females with same data as holotype (CAS; MCZ; BMNH).

This series of females, found in a nest of the common *S. lujae*, constitutes the first known socially parasitic dacetinae in the Afrotropical region. It is easily distinguished from the female of the host-species, as follows.

<i>inquilina</i>	<i>lujae</i>
Scrobes vestigial, upper scrobe margins not sharply defined behind level of anterior margin of eye.	Scrobes present, upper scrobe margin sharply defined to beyond level of posterior margin of eye.
Head without laterally projecting long fine hairs on upper scrobe margins; without specialized standing hairs on cephalic dorsum.	Head with laterally projecting long fine hairs on upper scrobe margins; with specialized standing hairs on cephalic dorsum.
Alitrunk and first gastral tergite with fine soft curved hairs only, without standing hairs.	Alitrunk and first gastral tergite without fine soft curved hairs, with standing hairs.
Pronotal humeri without flagellate hairs.	Pronotal humeri with flagellate hairs.
Propodeum unarmed.	Propodeum bidentate.
Basigastral costulae absent.	Basigastral costulae present.

inquilina – cont.

Petiole node in dorsal view as long as or slightly longer than broad, smooth, lacking a transverse spongiform strip posteriorly. Scapes long, SI >100

lujae – cont.

Petiole node in dorsal view broader than long, punctate, with a transverse spongiform strip posteriorly.

Scapes short, SI <100.

***Serrastruma ludovici* (Forel)**

(Figs 34, 41)

Strumigenys ludovici Forel, 1904b: 369. Syntype workers, MADAGASCAR: 'Madagascar meridional', 1899 (*M. Sikora*) (MHN) [examined].

Strumigenys alluaudi Santschi, 1910b: 360. Syntype workers, TANZANIA: Tanga Cave, Kulumuzi, iv.1909 (*Ch. Alluaud*) (NMB) [examined]. **Syn. n.**

Strumigenys (Trichoscapa) alluaudi st. *nigeriensis* Santschi, 1914b: 376. Syntype workers, NIGERIA: Olokemeji (*F. Silvestri*) (NMB) [examined]. [Wrongly synonymized with *simoni* by Brown, 1952a: 83.] **Syn. n.**

Strumigenys rothkirchi Wasmann, 1918: 142, pl. 2, figs 9, 10. Syntype workers, CAMEROUN: no loc., 1912 (*v. Rothkirch*) (MNHU). [Synonymized with *alluaudi* by Brown, 1952a: 75.]

Strumigenys (Cephaloxys) escherichi subsp. *lotti* Weber, 1943: 378, pl. 15, fig. 13. Syntype workers, SUDAN: Equatoria, Lotti Forest, 5.viii.1939, no. 1451 (*N. A. Weber*) (BMNH; MCZ; MRAC) [examined]. **Syn. n.**

Serrastruma alluaudi (Santschi) Brown, 1952a: 75.

Serrastruma lotti (Weber) Brown, 1952a: 76. [Raised to species.]

Serrastruma ludovici (Forel) Brown, 1952a: 85. [Species inquirenda.]

WORKER. TL 1.9–3.0, HL 0.46–0.66, HW 0.36–0.49, CI 71–80, ML 0.17–0.30, MI 35–50, SL 0.32–0.50, SI 86–115, PW 0.26–0.38, Al 0.55–0.80 (85 measured).

Basal 4–8 denticles on mandibular masticatory margin enlarged, usually very conspicuously coarser broader and longer than the preceding denticle row. In a few samples the enlarged denticles not so obvious and sometimes the enlarged series may be better developed on one mandible than on the other. Upper scrobe margins defined by a narrow flange or rim which is broadest just behind the frontal lobes and peters out posteriorly, frequently the rim not even extending to the apex of the scrobe. Upper scrobe margins each with a fine flagellate hair just behind the level of the eye. Clypeus usually finely reticulate to punctate, only rarely the sculpture reduced. Dorsum of head behind clypeus finely and densely reticulate-punctate. Ground-pilosity of cephalic dorsum of short narrow to moderately broad spatulate hairs which are decumbent and directed anteriorly. A row of longer spatulate hairs present on the false margin of the clypeus which project forwards over the bases of the mandibles. Dorsum of head with a single pair of standing stout hairs which are narrowly clavate apically, situated behind the highest point of the vertex. Pronotum narrowly marginate anteriorly, not marginate laterally. Mesonotum in profile sloping posteriorly to the impressed metanotal groove, the propodeal dorsum shallowly convex and sloping posteriorly to the propodeal teeth; these latter variable in size, usually triangular but sometimes reduced to small rounded lobes. Infradental lamella usually narrow and inconspicuous, only rarely moderately broad but sometimes vestigial. Sides of pronotum usually smooth but sometimes with sculpture, especially on the upper portions. Mesopleuron, metapleuron or both punctate, sides of propodeum punctate. Frequently the central area of the mesopleuron with sculpture reduced or absent, more rarely with the central area of the metapleuron smooth. Sculpture of pronotal dorsum very variable, ranging from almost smooth to moderately strongly sculptured. At one end of the range the pronotum is smooth except for a median longitudinal carina, at the other a number of oblique to longitudinal fine striae or costulae are present and the spaces between them may be finely punctulate. All grades between these extremes have been noted, including a few sample where the pronotum is predominantly punctate. Frequently the striate component is reduced leaving weak punctures as the predominant component, but in this case they are by no means as strongly developed nor as conspicuous as the punctures on the mesonotum. Dorsal surface of mesonotum and propodeum reticulate-punctate. Pronotum with humeral flagellate hairs. Mesonotum with a pair of stout curved standing hairs which are clavate apically. Ground-pilosity of dorsal alitrunk of short curved hairs which are sparse and subdecumbent to decumbent. With the pedicel segments in profile the spongiform appendages reduced. Petiole with a narrow ventral strip and small lateral lobe. Postpetiole with a moderately developed ventral lobe which is larger than the lateral spongiform appendage but smaller, and usually obviously smaller, than the exposed area of the postpetiolar disc. In dorsal view the petiole node reticulate to reticulate-punctate, with a narrow posterior spongiform strip. Postpetiole usually

reticulate to reticulate-punctate, rarely the sculpture reduced and superficial, bordered posteriorly by a lamellate spongiform strip which abuts a similar narrow strip on the anterior margin of the first gastral tergite. Basigastral costulae present, usually short. Petiole, postpetiole and gaster dorsally with stout standing hairs which are clavate apically. Colour yellow to mid-brown.

One of the most successful members of the genus and of the Afrotropical dacetines as a whole, *ludovici* ranges very widely over the whole continent and is also established in Madagascar and Mauritius. It is closely related to *simoni* but most *ludovici* samples are instantly distinguishable by the enlarged basal series of mandibular denticles in the latter. In those few samples where the enlargement of the denticles is not marked the differentiating characters tabulated under *simoni* will separate the two.

Apart from the diagnostic enlarged denticle series (Fig. 34) *ludovici* is separated from *dotaja* by the presence in the latter of flagellate mesonotal hairs and simple gastral hairs; from *sulumana* and *maynei* by those species' lack of cephalic flagellate hairs and strongly developed upper scrobe margins. Usually *ludovici* is distinguished from *lujae*, *serrula* and *concolor* by their blanketing reticulate-punctate pronotal sculpture, which generally is not seen in *ludovici*, but in the few populations of the latter with a predominantly punctate pronotum the enlarged basal mandibular denticles of *ludovici* will separate them. *S. miccata* shares the character of enlarged basal denticles with *ludovici* but this minute species is very easily separated by the characters noted in the discussion of the former.

In his revision of *Serrastruma* Brown (1952a) treated *ludovici* under the names *alluaudi* and *lotti*, leaving *ludovici* as a species inquirenda as he had not been able to examine the type-series. However, he speculated that *ludovici* might be the senior synonym of *alluaudi* and that *alluaudi* and *lotti* may grade into one another. A few years ago he informed me that, having examined the types of *ludovici*, he was convinced that the synonymy *ludovici* = *alluaudi* was in order, and further that the characters which he had invoked to separate *lotti* from *alluaudi* (Brown, 1952a: 86) were indeed gradient, so that that species should also fall into the synonymy of *ludovici*. The present investigation, utilizing much more material than was available to Brown, has served to confirm all these findings.

Two other changes to the synonymies listed by Brown should be mentioned here. Firstly, the name *alluaudi* st. *nigeriensis* was included by Brown in the synonymy of *simoni*, but a re-examination of the type-series of *nigeriensis* shows them to have the characteristic dentition of *ludovici* and the name is herewith transferred to the synonymy of this species. Secondly, *raymondi* was described from a mixed series of *ludovici* and *simoni* originating in Mauritius, where both are well established. As Brown (1952a: 75) pointed out the 'type' (= holotype) designated by Donisthorpe was referable to *simoni*. This is the only specimen in the entire series bearing a type-label and there seems no reason to doubt that this was the specimen chosen as holotype by Donisthorpe; thus *raymondi* is correctly referred to the synonymy of *simoni*, and not to the synonymy of *alluaudi* (= *ludovici*) where it was left by Brown.

MATERIAL EXAMINED

Guinea-Bissau: Rio Cassine (*L. Fea*). **Ivory Coast:** Sassandra (*I. Löbl*); Man (*I. Löbl*); Man (*V. Mahnert & J.-L. Perret*); Abidjan, Banco Nat. Pk. (*I. Löbl*); Banco Forest (*W. L. Brown*); Issoneu (*V. Mahnert & J.-L. Perret*); Agboville, Yapo Forest (*I. Löbl*); Anguédedou Forest Res. (*W. L. Brown*); Lamto (*W. H. Gotwald & R. Schaefer*); Sangrobo (*W. L. & D. E. Brown*); Divo (*L. Brader*). **Ghana:** Mampong (*D. Leston*); Tafo (*D. Leston*); Tafo (*B. Bolton*); Mt Atewa (*C. A. Collingwood*); Kade (*W. H. Gotwald & R. Schaefer*). **Togo:** Palimé, Klouto Forest (*Vit*). **Nigeria:** Olokemeji (*F. Silvestri*); Gambari (*B. Bolton*). **Cameroun:** Korup (*D. Jackson*); Nkoemvon (*D. Jackson*); nr Yaounde (*G. Terron*). **Gabon:** Makokou (*W. H. Gotwald*); Plateau d'Ipasa (*J. A. Barra*). **Congo:** Nkogo (*L. Fea*). **Zaire:** Irangi (*E. S. Ross & R. E. Leech*); Ruwenzori, Mwenda (*J. C. Bradley*); Ituri Forest, Beni Irumu (*N. A. Weber*); Epulu (*T. Gregg*). **Sudan:** Equatoria, Kagelu (*N. A. Weber*); Lotti Forest (*N. A. Weber*); Imatong Mts (*N. A. Weber*). **Uganda:** Kampala (*N. A. Weber*). **Tanzania:** Amani (*E. S. Ross & R. E. Leech*); Tanga Cave Kulumuzi (*Ch. Alluaud*). **Angola:** Duque de Braganca Falls (*P. Hammond*); Dundo, Carrisso Pk. (*L. de Carvalho*); Saurimo (*L. de Carvalho*). **Mozambique:** Amatongas Forest (*G. Arnold*). **Zimbabwe:** Melsetter (*R. Mussard*); Chirinda Forest (*E. S. Ross & R. E. Leech*). **South Africa:** Natal, Zululand, Eshowe (*R. E. Turner*); Eshowe (*G. Arnold*); Gillitts (*W. L. & D. W. Brown*). **Madagascar:** Perinet (*E. S. Ross*); no loc. (*Sikora*). **Mauritius:** Le Pouce Mt (*R. Mamer*); Le Pouce Mt (*W. L. Brown*); W. of Petria (*W. L. Brown*).

Serrastruma lujae (Forel)

(Fig. 44)

- Strumigenys lujae* Forel, 1902: 294 (footnote), pl. 1, fig. 1. Syntype workers, MOZAMBIQUE: Zambesi, Morrumballe (*E. Lujá*) (MHN) [examined].
- Strumigenys reticulata* Stitz, 1910: 141. Syntype workers, female, CAMEROUN: Bibundi (*Tessmann*) (MNHU). [Synonymy by Brown, 1952a: 78.]
- Strumigenys* (*Cephaloxys*) *glanduscula* Santschi, 1919: 88. Syntype workers, ZAIRE: Yambuya, 25.ii., no. 79 (*Bequaert*) (MRAC; MCZ) [examined]. [Synonymy by Brown, 1952a: 78.]
- Strumigenys* (*Xephaloxys*) [sic] *bequaerti* Santschi, 1923: 286. Syntype workers, ZAIRE: Ruwenzori, 10.vii.1914 (*Bequaert*) (BMNH; MRAC; MCZ) [examined]. **Syn. n.**
- Strumigenys* (*Cephaloxys*) *gerardi* Santschi, 1923: 287. Syntype workers, ZAIRE: Katanga, R. Kasa, Manyema, 1918 (*Gerard*) (MRAC) [examined]. [Synonymy by Brown, 1952a: 78.]
- Strumigenys* (*Cephaloxys*) *calypso* Santschi, 1923: 288, fig. 4a. Holotype worker, TANZANIA: Ouha (*Meyer*) (NMB) [examined]. **Syn. n.**
- Strumigenys* (*Cephaloxys*) *aequalis* Menozzi, 1942: 177. Syntype workers, EQUATORIAL GUINEA: Fernando Po I., Concepcion (*H. Eidmann*) (NMB; MCZ) [examined]. [Synonymy by Brown, 1952a: 78.]
- Serrastruma lujae* (Forel) Brown, 1952a: 78.
- Serrastruma bequaerti* (Santschi) Brown, 1952a: 80.
- Serrastruma calypso* (Santschi) Brown, 1952a: 85. [Species inquirenda.]

WORKER. TL 2.2–3.3, HL 0.50–0.80, HW 0.42–0.62, CI 75–86, ML 0.18–0.32, MI 33–42, SL 0.32–0.58, SI 75–100, PW 0.30–0.66, AL 0.58–0.98 (55 measured).

Mandibular denticles regular, without a suddenly enlarged basal series but sometimes the denticular row very evenly and gradually becoming slightly larger towards the base; the basalmost denticle frequently larger than those preceding. Upper scrobe margins with a long simple or weakly flagellate hair projecting laterally just behind the level of the eyes. Dorsum of head reticulate-punctate everywhere, the sculpture fine and even. Ground-pilosity of dorsal head consisting of narrowly spatulate anteriorly curved short hairs which are decumbent or closely applied to the surface. Standing pilosity of head consisting of a posterior transverse row of 4 hairs situated close to the occipital margin and a more anteriorly situated pair just in front of the highest point of the vertex. The standing hairs are usually simple and more or less cylindrical, often pointed apically but sometimes very weakly swollen at their apices. Alitrunk in profile with the promesonotum convex and sloping posteriorly to the impressed metanotal groove. Behind the metanotal groove the propodeum is shallowly convex and sloping to the teeth posteriorly. Propodeal teeth very variable in shape and size, varying from obtuse angles to strong triangular teeth. Infradental lamellae present on the propodeal declivity but often narrow. Sides of alitrunk often reticulate-punctate everywhere but with some variation in intensity. The sides of the pronotum may be only faintly sculptured and, in some cases, the mesopleuron may be partially or entirely smooth. A central smooth patch may also occur on the metapleuron. Dorsal alitrunk reticulate-punctate everywhere, the punctation on the pronotum usually fine and very dense. Sometimes the intensity of the sculpture reduced so that the punctures are less well defined than usual. Pronotum with humeral flagellate hairs present. Mesonotum with a single pair (or exceptionally with 2 pairs) of stout standing hairs situated anteriorly on the sclerite. Ground-pilosity of dorsal alitrunk of scattered finely spatulate hairs which are decumbent to appressed and inconspicuous. With the pedicel segments in profile the spongiform appendages moderately developed. In dorsal view the petiole and postpetiole both bounded posteriorly by a narrow lamellate spongiform strip, both usually punctate or finely reticulate dorsally though on the postpetiole the sculpture may be almost effaced. Base of first gastral tergite with a narrow lamellar strip and with basigastral costulae present. Petiole with one or more pairs of standing stout hairs, the postpetiole with 2 or more pairs; first gastral tergite with numerous similar hairs. Colour yellow to medium brown.

This very successful, common, widely distributed species shows a size range which is notably greater than in any other *Serrastruma*. Brown (1952a: 79) has discussed the size variation and concluded that only a single species is represented, and the present survey finds no argument with that conclusion.

The closest relatives of *lujae* are *serrula* and *concolor*, the three together sharing the characters of dense reticulate-punctate sculpture on the pronotal dorsum and lack of an enlarged series of basal denticles on the mandible. Beside these features other easily observed characters useful in separating *lujae* and its immediate allies from the other species of the genus are as follows. In *dotaja* the mesonotum is equipped with a single pair of extremely long flagellate hairs

and the gaster has only a single pair of simple hairs. In *maynei*, *sulumana* and *geoterra* the upper scrobe margins lack projecting hairs. In *simoni* the spongiform appendages of the pedicel segments are more massively developed (Figs 40, 44). In *ludovici*, beside the enlarged mandibular denticles, the head has only a single pair of standing hairs, situated posteriorly. The minute *miccata* has short mandibles, lacks projecting hairs on the upper scrobe margins and has straight clavate hairs at the pronotal humeri.

S. serrula and *concolor* are both persistently small species, only overlapping the lower end of the size range given for *lujae*. *S. serrula* is separated from *lujae* by having 3 or 4 pairs of mesonotal standing hairs and elevated ground-pilosity on the head and alitrunk. *S. concolor* has 2 or 4 clavate standing hairs on the head (as opposed to 6 relatively fine hairs in *lujae*), and has only a single pair of hairs on the postpetiole. Beside this most *concolor* specimens show a marked indentation or impression of the upper scrobe margin at the site of origin of the projecting flagellate hair.

The synonymy of *lujae* given by Brown (1952a: 78) is extended here to include the names *calypso* and *bequaerti*. *S. calypso* was included by Brown as a species inquirenda as the holotype of this form was not available for study at the time of his revision. An examination of the *calypso* holotype places it firmly in the synonymy of *lujae*. *S. bequaerti* was treated as a rather doubtful separate species by Brown (1952a: 80) who said 'This form may eventually prove to be a montane subspecies or even a synonym of *lujae*.' He has since informed me that he is now convinced that *bequaerti* and *lujae* grade together without possibility of any meaningful division being made, and I fully concur with this opinion.

S. lujae nests in rotten wood and forages there and in the leaf litter layer. In a letter William L. Brown has informed me that the prey are collembolans. Speaking of his observations in Banco Forest, Ivory Coast, made in 1963, he says 'The *S. lujae* nest was in the split end of a log and consisted of many, perhaps a thousand or more, workers and copious brood. I found the nest by following a single-file trail of workers along the top of the log, spaced out at intervals of 4–10 cm, almost every one of which carried in its jaws a dead (or at least motionless) entomobryid collembolan with furcula extended. The Collembola were about the same size as the ants carrying them, or slightly larger. In the space of about 10 minutes I counted 40 springtails being carried along the log on what appears to have been a trunk foraging trail. No other kinds of insect prey were seen being carried or lying within the dissected nest.'

MATERIAL EXAMINED

Ivory Coast: Banco Forest (*I. Löbl*); Banco Forest (*W. L. Brown*); Man (*I. Löbl*); Man (*V. Mahnert & J.-L. Perret*); Yapo Forest, Agboville (*I. Löbl*); Anguédou Forest (*W. L. Brown*); Sangrobo (*W. L. & D. E. Brown*). **Ghana:** Tafo (*C. A. Collingwood*); Tafo (*B. Bolton*); Aburi (*D. Leston*); Mamfe Scarp (*D. Leston*); Bolgatanga (*E. S. Ross & K. Lorenzen*). **Nigeria:** Gambari (*B. Bolton*). **Cameroun:** Nkoemvon (*D. Jackson*); nr Yaounde (*G. Terron*); Mt Cameroun (*L. Fea*); Mt Cameroun (*B. Malkin*); Batanga (*G. Schwab*). **Gabon:** Makokou (*W. H. Gotwald*); Plateau d'Ipassa (*J. A. Barra*). **Zaire:** Yambuya (*J. Bequaert*); Ruwenzori (*J. Bequaert*); Ruwenzori (*N. A. Weber*); Burunga (*J. Bequaert*); Katanga, Manyema (*Gerard*); Ituri Forest, Irumu (*N. A. Weber*); Ituri, Mt Hoyo (*E. S. Ross & R. E. Leech*); Albertville (*E. S. Ross & R. E. Leech*); Thysville (*E. A. Ross & R. E. Leech*); Mt Kahuzi (*E. S. Ross & R. E. Leech*); Lwiro R., Bukavu (*E. S. Ross & R. E. Leech*). **Equatorial Guinea:** Fernando Po I., Moka (*L. Fea*); Fernando Po I., Concepcion (*H. Eidmann*). **São Tomé I.:** Rib., Palma (*L. Fea*); no loc. (*Bl Malkin*). **Angola:** Gubela (*P. Hammond*); Salazar (*P. Hammond*); Duque de Braganza Falls (*P. Hammond*); Dundo (*A. Machado*); Dundo (*L. de Carvalho*); Tchimana R. (*A. Machado*). **Sudan:** Equatoria, Khor Aba (*N. A. Weber*). **Uganda:** Ruwenzori, Mubuku (*G. O. Evans*); Ft Portal (*N. A. Weber*). **Rwanda:** Rangiro (*P. Werner*). **Burundi:** Bujumbura (*A. Dejean*). **Kenya:** Embu, Irangi Forest Sta. (*V. Mahnert & J.-L. Perret*); Mau Forest (*F. Meneghetti*); Kaimosi Mission (*E. S. Ross & R. E. Leech*); **Tanzania:** Ouha (*Meyer*); Mt Meru (*E. S. Ross & R. E. Leech*); Amani (*E. S. Ross & R. E. Leech*); Uluguru Mts. Bunduki (*E. S. Ross & R. E. Leech*). **Mozambique:** Morrumballe (*E. Lujá*). **Zimbabwe:** Umtali, Melssetter (*R. Mussard*); Vumba Mts (*W. L. Brown*). **South Africa:** Cape Prov., Port St John (*R. E. Turner*).

Serrastruma maynei (Forel)

(Fig. 37)

Strumigenys (*Trichoscapa*) *maynei* Forel, 1916: 427. Syntype workers, female, male, ZAIRE: Stanleyville (= Kisangani) (Kohl) (MHN; MRAC; MCZ) [examined].

Strumigenys (*Trichoscapa*) *maynei* var. *latiuscula* Forel, 1916: 428. Syntype workers, ZAIRE: Eala, 20.viii.1912 (*R. Mayné*) (MHN; MRAC; MCZ) [examined]. [Synonymy by Brown, 1952a: 77.]

Serrastruma maynei (Forel) Brown, 1952a: 77.

WORKER. TL 2.3–3.0, HL 0.52–0.66, HW 0.44–0.54, CI 78–86, ML 0.18–0.24, MI 32–39, SL 0.34–0.42, SI 73–83, PW 0.31–0.41, AL 0.62–0.82 (45 measured).

Mandibular denticles regular, without a suddenly enlarged series of 4–8 denticles basally but often with the basalmost denticle larger than those preceding. Upper scrobe margins strongly developed into broad projecting flanges which run the length of the scrobe and do not peter out posteriorly, the margins without flagellate hairs present. Clypeus sculptured, finely punctulate to granular, with short but broad spatulate ground-pilosity and a row of longer spatulate hairs projecting forwards over the bases of the mandibles from the false anterior clypeal margin. Dorsum of head strongly reticulate-punctate, with conspicuous short but broad spatulate ground-pilosity. In profile the cephalic dorsum behind the highest point of the vertex with 4–6 stout standing hairs which are narrowly to moderately clavate apically, the variation in number occurring in single nest-series. Usually 4 such hairs are present, situated in a row in front of the occipital margin; rarely a pair is present anterior to this row. Alitrunk in profile with promesonotum shallowly convex and sloping more steeply posteriorly to the impressed metanotal groove. Propodeum convex dorsally, on a lower level than the promesonotum and terminating posteriorly in a pair of triangular teeth which are subtended by conspicuous spongiform infradental lamellae. Sides of pronotum longitudinally costulate, usually distinctly so but sometimes the costulae effaced in places or becoming weaker lower down the sides; the spaces between the costulae smooth. Pleurae and sides of propodeum densely reticulate-punctate. Pronotal dorsum longitudinally to obliquely strongly costulate, the spaces between the costulae smooth; this sculpture usually weaker in small workers than in large. Remainder of dorsal alitrunk strongly reticulate-punctate. Flagellate hairs usually absent from pronotal humeri (present in only a single specimen of those examined). Mesonotum with a single pair of curved standing clavate hairs. Ground-pilosity of dorsal alitrunk dense spatulate and very conspicuous. Spongiform appendages of pedicel segments moderately developed in profile. The petiole with a ventral lamella and small lateral processes, the postpetiole with a well developed ventral lobe and smaller lateral lobe. Petiole in dorsal view reticulate-punctate, sometimes only superficially so, with a narrow transverse spongiform strip posteriorly. Postpetiole dorsally smooth to superficially punctulate, sometimes with a suggestion of minute longitudinal striae; with a narrow posterior spongiform strip which abuts a similar strip on the base of the first gastral tergite. Basigastral costulae short. Dorsal surfaces of petiole, postpetiole and gaster with stout apically clavate hairs. Colour dull brownish yellow to mid-brown.

S. maynei is characterized by its absence of flagellate hairs, generally strong costulate pronotal sculpture, broad upper scrobe margins and conspicuous ground-pilosity; it is unlikely to be confused with any other species. In distribution it appears to be restricted to the forest zones of West and central Africa, and Uganda. Georges Terron's collection has yielded a couple of small workers from Cameroun in which the pronotal sculpture is very reduced indeed. These may represent a separate sibling species but I suspect that they are more likely to be members of the first brood of a new colony.

The closest relative of *maynei* is *geoterra*, a species which shares the characters of broad upper scrobe margins, lack of flagellate hairs and very broad conspicuous ground-pilosity. However, in *geoterra* the entire alitrunk is glassy smooth and without trace of sculpture, the upper scrobe margins are very broad and strikingly convex (compare Figs 36, 37), the cephalic ground-pilosity is even coarser than in *maynei*, there is an obvious impression separating the pronotum and mesonotum, the pronotal dorsal pilosity is strong and elevated, and the petiole node is smooth dorsally.

Although often found nesting in rotten wood in the leaf litter layer *maynei* may also nest in rot holes in trees some distance above the ground. In 1970 at Tafo in Ghana I observed a nest in a cocoa branch about 1.7 m above the ground. One of the workers returning to this nest was carrying a small nematoceran fly.

MATERIAL EXAMINED

Guinea-Bissau: Bolama (*L. Fea*). **Ivory Coast:** Lamto (*W. L. & D. E. Brown*). **Ghana:** Aburi (*D. Leston*); Wiawso (*D. Leston*); Tafo (*C. A. Collingwood*); Tafo (*B. Bolton*). **Nigeria:** Gambari (*B. Bolton*). **Cameroun:** nr Yaounde (*G. Terron*). **Equatorial Guinea:** Annobon I. (Cambridge Univ. Expd.). **Zaire:** Kisangani (*Kohl*); Eala (*R. Mayné*); Ruwenzori (*J. C. Bradley*). **Angola:** Dundo (*A. Machado*). **Uganda:** Maragambo Forest (*E. S. Ross & R. E. Leech*). **Tanzania:** Lk. Manyara (*E. S. Ross & R. E. Leech*).

Serrastruma miccata sp. n.

(Fig. 39)

HOLOTYPE WORKER. TL 1.7, HL 0.46, HW 0.32, CI 70, ML 0.12, MI 26, SL 0.37, SI 116, PW 0.24, AL 0.46.

Basal 4–5 denticles on mandibular masticatory margin suddenly and conspicuously enlarged, distinctly much coarser and broader than those preceding. Head narrow, antennal scapes long (CI and SI, above). Upper scrobe margins very feebly developed, merely an edge without a projecting lamina; flagellate hairs absent from upper scrobe margins. Clypeus finely punctulate, with curved narrowly spatulate small hairs and with an anteriorly projecting row of such hairs on the false anterior clypeal margin. Ground-pilosity of cephalic dorsum of minute anteriorly curved inconspicuous hairs which are narrowly spatulate and subdecumbent, those situated posteriorly tending to be splayed or forked at the apex. Dorsum of head without specialized standing longer hairs which are differentiated from the ground-pilosity. Dorsum of head densely reticulate-punctate everywhere. Pronotum narrowly marginate anteriorly, not marginate laterally. In dorsal view the pronotum and mesonotum separated by a shallow faint impression, the mesonotum and propodeum separated by a narrow fine transverse line. In profile the mesonotum weakly raised above the level of the pronotum and sloping shallowly downwards posteriorly. Metanotal groove a narrowly incised line, not impressed. Propodeum continuing the slope of the mesonotum posteriorly and ending in a minute triangular tooth (left tooth broken). Infradental lamellae absent. Pleurae mostly smooth, with some peripheral punctulae. Sides of pronotum with very feeble vestiges of sculpture. Pronotal dorsum with vestigial superficial reticulation, the mesonotum and propodeum finely punctulate. Flagellate hairs absent from alitrunk, the pronotal humeri with a pair of short straight hairs which are quite stout and clavate apically. Dorsal surfaces of pronotum and mesonotum with dense short ground-pilosity consisting of anteriorly or medially curved elevated hairs, those on the mesonotum appearing clavate in profile. Spongiform appendages of pedicel segments in profile very reduced, the ventral petiolar appendage represented only by a minute crest. Ventral lobe of postpetiole very small and lateral process reduced to a thin strip. Petiole node in dorsal view slightly longer than broad, superficially punctulate and with a minute transverse crest on the posterior border which represents the last vestige of the spongiform strip. Postpetiole in dorsal view marginally longer than broad and with its posterior margin sharply indented medially. Spongiform material absent laterally but posteriorly with a narrow lamelliform strip which abuts a similar narrow strip on the base of the first gastral tergite. Postpetiole punctulate-granular and the first gastral tergite with extremely fine short basal costulae. Dorsal surfaces of petiole, postpetiole and gaster with numerous short apically clavate hairs. Colour yellow.

Holotype worker, **Ghana:** Mampong, 26.i.1970 (*P. M. Room*) (BMNH).

Although sharing with *ludovici* the character of an enlarged basal series of mandibular denticles, I suspect that *miccata* has acquired it independently as otherwise the two share very few diagnostic characters. In fact *miccata* is remote from all the known species of *Serrastruma* on a number of counts. Most obvious of these is the differently shaped alitrunk (compare Figs 39–44). Whereas in all other species the posterior portion of the mesonotum slopes to an impressed metanotal groove and the promesonotum forms a surface on a higher level than the propodeum, in *miccata* the mesonotum and propodeum form a more or less uniform slope, the metanotal groove is not impressed and the promesonotum is not at a higher level than the propodeum. In *miccata* the petiole and postpetiole in dorsal view are fractionally longer than broad, whereas in all other species they are broader, in the case of the postpetiole much broader, than long. The mandibles of *miccata* are short but the scapes are long, a combination not found elsewhere in *Serrastruma*, and the lack of elongate specialized hairs on the head and dorsal alitrunk in *miccata* is not repeated elsewhere in the genus, where at least a single cephalic and a single mesonotal pair occur. These characters, along with the unique development of straight clavate hairs at the pronotal humeri in *miccata* in place of the more usual flagellate hairs, and the small size of the species, render it immediately recognizable.

Serrastruma serrula (Santschi)

(Fig. 42)

Strumigenys lujae var. *serrula* Santschi, 1910a: 390. Holotype worker, CONGO: Brazzaville (A. Weiss) (NMB) [examined].

Strumigenys serrula Santschi; Santschi, 1910b: 361. [Raised to species.]

Strumigenys (Cephaloxys) uelensis Santschi, 1923: 289, fig. 4b. Syntype workers, ZAIRE: Haut Uelé, Watsa, xi.1919 (L. Burgeon) (MRAC) [examined]. [Synonymy by Brown, 1952a: 81.]

Serrastruma serrula (Santschi) Brown, 1952a: 81.

WORKER. TL 1.9–2.3, HL 0.44–0.54, HW 0.34–0.44, CI 75–88, ML 0.15–0.18, MI 32–37, SL 0.26–0.33, SI 65–82, PW 0.24–0.30, AL 0.48–0.56 (50 measured).

Mandibular denticles evenly sized to the base or minutely and very gradually increasing in size basally, the basalmost denticle usually enlarged but never with a series of 4–8 obviously enlarged basal denticles. Upper scrobe margins regular or with a shallow impression at the site of the flagellate hair. Ground-pilosity of head narrowly spatulate, quite dense and very conspicuous, curved anteriorly and elevated, not closely applied to the surface. Dorsum of head with an occipital transverse row of 4 standing longer hairs which are usually cylindrical and tapered apically, only very rarely with their apices slightly swollen. Commonly a more anteriorly situated pair of similar hairs is present, just in front of the highest point of the vertex. All of these standing hairs are only slightly longer and stouter than the curved hairs of the ground-pilosity. Entire dorsum of head sharply and strongly reticulate-punctate. Dorsal alitrunk with the convex promesonotum sloping posteriorly to the impressed metanotal groove. Propodeal dorsum convex and sloping down to the teeth, the latter usually acutely triangular but variable in size; infradental lamellae present down the sides of the propodeal declivity. Sides of pronotum and the pleurae punctate, the punctures on the mesopleuron often more superficial and more widely spaced than elsewhere; infrequently the punctures superficial everywhere on the sides. Dorsal alitrunk strongly reticulate-punctate everywhere, the punctures sharply defined and the pronotum often with feeble longitudinal rugulae or striae which when present are very obviously secondary to the punctate component. Pronotum with elongate flagellate hairs at the humeri. Mesonotum with 3 (rarely 4) pairs of standing hairs; these are relatively slender, at most only feebly expanded apically. The posteriormost of these hairs is situated at or very close to the metanotal groove and is very variable in size. In some samples it is almost as long as the preceding mesonotal hairs but frequently is only as long as the ground-pilosity; whatever its length it is always directed posteriorly. Ground-pilosity on promesonotum quite long and conspicuous, dense and elevated, not closely applied to the surface. In profile the spongiform appendages of the pedicel segments moderately developed, the ventral appendage of the petiole may be reduced to a narrow ridge but is usually spongiform. Lateral and ventral spongiform lobes of postpetiole present. In dorsal view the surfaces of both the petiole and postpetiole reticulate to reticulate-punctate, sometimes the sculpture superficial and faint. Posterior spongiform strips of both segments narrow as is the basal strip on the first gastral tergite. Basigastral costulae present but frequently short and widely spaced, the gaster otherwise unsculptured. Petiole and postpetiole always with more than one pair of standing hairs, the gaster with numerous hairs. These vary from almost cylindrical to very weakly expanded apically, not strongly clavate. Colour dull yellow to yellowish brown.

This widespread persistently small species is related to *concolor* and *lujae*. Together the three are characterized by their lack of an enlarged basal series of mandibular denticles, presence of cephalic flagellate hairs and dense reticulate-punctate pronotal sculpture. The differences separating *serrula* and *concolor* are tabulated under the latter name.

S. serrula is separated from *lujae* by its size and pilosity. The largest specimens of *serrula* only overlap the very smallest individuals of *lujae* (*serrula* HW 0.34–0.44, SL 0.26–0.33; *lujae* HW 0.42–0.62, SL 0.32–0.58). Ground-pilosity everywhere on the head and promesonotum is relatively short, inconspicuous and closely applied to the surface in *lujae*. This gives the ant a rather smooth appearance and emphasises the long specialized hairs which stand out very conspicuously. In *serrula* the ground-pilosity is quite long and very distinctive, being markedly elevated from the surface so that the long specialized hairs which project from the ground-pilosity are by no means as distinctive in appearance. On the mesonotum long hairs are restricted to a single anteriorly placed pair in *lujae* (or very exceptionally a second pair may be present, sited very close to the first) whereas in *serrula* three pairs are generally present distributed along the length of the mesonotum and with the posteriormost pair at or very close to the metanotal groove. Finally the reticulate-punctate pronotal sculpture is usually more strongly

developed and more sharply defined in *serrula* than in *lujae* and *serrula* frequently has superimposed fine longitudinal striae or rugulae on the punctate surface.

S. serrula nests in pieces of rotting wood embedded in the leaf litter and topsoil layers, and preys on the isotomid collembolan *Folsomia candida* Willem. Its predatory behaviour has been investigated in some detail by Dejean (1980a; 1980b).

MATERIAL EXAMINED

Ivory Coast: Tai Forest (V. Mahnert & J.-L. Perret); Bingerville (V. Mahnert & J.-L. Perret); Lamto (J. Levieux); Anguédédou (W. L. Brown); Banco Forest (W. L. Brown); Divo (L. Brader). **Ghana:** Mampong (P. Room); Tafo (B. Bolton). **Cameroun:** Nkoemvon (D. Jackson); nr Yaounde (G. Terron). **Gabon:** Makokou (I. Lieberburg); Makokou (W. H. Gotwald). **Chad:** Haut Mbomu (N. A. Weber). **São Tomé I.:** Rib. Palma (L. Fea); Vista Algere (L. Fea); no loc. (J. Derron). **Congo:** Brazzaville (A. Weiss). **Zaire:** Ituri Forest, Irumi (N. A. Weber); Niangara (N. A. Weber); Hout Uelé, Watsa (L. Burgeon); Tchikapa (A. Machado). **Angola:** Salazar (P. Hammond); Duque de Braganca Falls (P. Hammond); Gubela (P. Hammond); Dundo (L. de Carvalho); Camissombo (A. Machado). **Sudan:** Equatoria, Kagelu (N. A. Weber). **Burundi:** Bujumbura (A. Dejean); Imbo Plain (A. Dejean); Bugarama (A. Dejean).

Serrastruma simoni (Emery)

(Fig. 40)

- Strumigenys simoni* Emery, 1895a: 42, pl. 2, fig. 21. Holotype worker, SOUTH AFRICA: Transvaal, Makapan, 1893 (E. Simon) (MCSN) [examined].
- Strumigenys escherichi* Forel, 1910: 261. Syntype workers, ETHIOPIA: Eritrea, Ghinda (K. Escherich) (MHN) [examined]. [Synonymy by Brown, 1952a: 82.]
- Strumigenys cognata* Santschi, 1910b: 362. Syntype workers, female, ANGOLA: Benguela, Cucala, 1910 (J. Crucher) (NMB; MRAC) [examined]. [Synonymy by Brown, 1952a: 82.]
- Strumigenys biconvexa* Santschi, 1913a: 258. Syntype workers, KENYA: Cheteni, xi.1911, st. 4 (Alluaud & Jeannel) (NMB) [examined]. [Synonymy by Brown, 1952a: 83.]
- Strumigenys cognata* st. *boerorum* Santschi, 1913a: 259. Syntype workers, SOUTH AFRICA: Zululand, Dukuduku (I. Trägårdh) (NMB) [examined]. [Synonymy by Brown, 1952a: 83.]
- Strumigenys escherichi* race *limbata* Forel, 1913c: 222. Syntype workers, ZIMBABWE: Bulawayo (G. Arnold) (MHN) [examined]. [Synonymy by Brown, 1952a: 83.]
- Strumigenys escherichi* var. *cliens* Forel, 1913d: 317. Syntype workers, ZAIRE: Katanga, Elizabethville, 1912 (Bequaert) (MHN; MRAC; MCZ) [examined]. [Synonymy by Brown, 1952a: 83.]
- Strumigenys (Trichoscapa) escherichi* st. *cognata* var. *obscuriventris* Santschi, 1914b: 376. Syntype workers, NIGERIA: Olokemeji (F. Silvestri) (NMB) [examined]. [Unavailable name.]
- Strumigenys (Trichoscapa) escherichi* st. *cognata* var. *fusciventris* Santschi, 1915: 261. [Unnecessary replacement name for *obscuriventris* Santschi.] [Unavailable name.]
- Strumigenys (Cephaloxys) raymondi* Donisthorpe, 1945: 779. Holotype worker, MAURITIUS: Corps de Garde Mt, 17.i.1944, no. 20 (R. Mamet) (BMNH) [examined]. [Wrongly synonymized with *alluaudi* by Brown, 1952a: 75. *S. raymondi* series is a mixture of *ludovici* (= *alluaudi*) and *simoni*, but holotype of *raymondi* belongs to the latter species.] **Syn. n.**
- Serrastruma simoni* (Emery) Brown, 1952a: 82.

WORKER. TL 2.4–3.0, HL 0.54–0.64, HW 0.44–0.52, CI 74–85, ML 0.20–0.22. MI 33–39, SL 0.34–0.41, SI 76–86, PW 0.28–0.36, AL 0.64–0.75 (60 measured).

Mandibular denticles small even and very regular, without an enlarged basal series but often with the basalmost denticle somewhat enlarged. Upper scrobe margins conspicuous, forming a punctulate or granular flange which extends back to the apex of the scrobe before petering out, the margins each with a single long flagellate hair arising just behind the level of the eye and projecting laterally. Clypeus sculptured on the disc, finely punctulate or granular, or sometimes feebly striate, with sparse spatulate appressed hairs. False anterior clypeal margin with a row of spatulate hairs which project forwards over the mandibular bases. Ground-pilosity of head of scattered but distinctive anteriorly directed spatulate hairs which are decumbent to appressed. Dorsum of head behind highest point of vertex with two pairs of stout standing hairs which are anteriorly curved and apically clavate. Dorsum of head densely reticulate-punctate. Pronotum not marginate laterally, the pronotum and anterior portion of mesonotum convex and on a higher level than the propodeum, the posterior portion of the mesonotum sloping steeply down to the metanotal groove which is broadly and shallowly impressed. Propodeal dorsum shallowly convex, the teeth usually broad and strongly developed, with a conspicuous infradental lamella. Alitrunk pleurae smooth,

devoid of sculpture or at most with punctulate vestiges peripherally. Sides of pronotum usually smooth but sometimes with one or two striae which extend onto the sides from the dorsum. Sculpture of pronotal dorsum variable, ranging from almost smooth with only vestiges of sculpture to quite strongly sculptured. Commonly the sculpture consists of few to several longitudinal to oblique fine costulae or striae on an almost or quite smooth surface. Variation away from this occurs either by reduction in number and intensity of the costulae or striae until the dorsum is almost unsculptured, or by intensification of the costulae or striae, or by the appearance of fine punctulation between them. However, in samples where punctulate sculpture occurs it is always very obviously secondary to the costulate or striate component, and in samples where the pronotum is smooth a median fine longitudinal carinula usually remains. Dorsal surfaces of mesonotum and propodeum finely and densely reticulate-punctate, as is the upper portion of the propodeal declivity between the teeth. Pronotum equipped at the humeri with a pair of long fine flagellate hairs, the mesonotum with a pair of stout curved hairs which are clavate apically. Ground-pilosity of promesonotum consisting of a few scattered narrowly spatulate hairs which are appressed or nearly so. Spongiform appendages of pedicel segments well developed in profile, the subpetiolar appendage running the length of the segment; the ventral and lateral spongiform lobes of the postpetiole large, the former usually somewhat larger than the latter. Petiole node in dorsal view finely reticulate-punctate, the sculpture sometimes faint, broader than long and with a conspicuous posterior collar of spongiform material. Postpetiole smooth dorsally, with spongiform material posterolaterally and with a broad posterior strip. Base of first gastral tergite bordered with a lamellate strip upon which the basigastral costulae arise and run posteriorly for a short distance on the tergite proper. Petiole and postpetiole each with a single pair of stout hairs which are clavate apically, the first gastral tergite with 1–8 pairs of such hairs. Colour ranging from yellowish brown to blackish brown.

A very successful and widely distributed species, *simoni* ranges throughout eastern and southern Africa. It has also been found in Nigeria but otherwise there are no records of its presence in West or central Africa, so this sample may represent an introduction or a mislabelled series. It is also known from Mauritius where it was most probably introduced by man.

S. simoni is separated from *dotaja* by the characters tabulated under the latter name. It is quickly distinguished from *lujae* and the related *concolor* and *serrula* by the presence in these three of dense blanketing reticulate-punctate sculpture on the promesonotum, and it is separated from *maynei*, *geoterra* and *sulumana* by those species' lack of cephalic flagellate hairs, which are very conspicuous in *simoni*. The minute *miccata* is readily separated, not only by its enlarged basal series of mandibular denticles and small size, but also by its possession of short clavate hairs at the pronotal humeri and lack of a metanotal impression. In *simoni* the long humeral flagellate hairs are obvious and the metanotal impression broad. Most samples of *ludovici* are easily distinguished from *simoni* by the presence in the former of a series of 4–8 enlarged denticles basally on the mandibular masticatory margin. However, in some *ludovici* series the denticles are not nearly so sharply defined as is usual, and these may be more difficult to tell apart. The following contrasting characters serve to separate the two, the first character noted is usually sufficient alone.

<i>simoni</i>	<i>ludovici</i>
Mandibular denticles small fine and regular to base, the basalmost may be enlarged.	Mandibular denticles with basal 4–8 enlarged.
Dorsum of head behind highest point of vertex with two pairs of standing curved clavate hairs.	Dorsum of head behind highest point of vertex with a single pair of standing curved clavate hairs.
Upper scrobe margins in full-face view forming a conspicuous flange which runs to the apex of the scrobe.	Upper scrobe margins in full-face view forming a narrow weak rim which rapidly peters out posteriorly.
Mesopleuron and metapleuron smooth except for peripheral weak sculpture.	Metapleuron and usually also mesopleuron with reticular or punctate sculpture.
With postpetiole in profile the area of the ventral spongiform lobe exceeding that of the exposed area of the postpetiolar disc (Fig. 40).	With postpetiole in profile the area of the ventral spongiform lobe usually much less than that of the exposed area of the postpetiolar disc; only rarely the two subequal (Fig. 41).

simoni – cont.

Infradental lamellae on propodeum
broad and conspicuous.
Ranges of indices, SI 76–86, CI 74–85,
MI 33–39 (ML = $0.42\text{--}0.48 \times \text{HW}$).

ludovici – cont.

Infradental lamellae on propodeum
usually narrow or vestigial.
Range of indices, SI 86–115, CI 71–80,
MI 35–50 (ML = $0.45\text{--}0.68 \times \text{HW}$).

The extensive synonymy of *simoni* is basically as Brown (1952a: 82–83) left it except for a couple of minor modifications. The name *alluaudi* st. *nigeriensis*, formerly included in the synonymy of *simoni*, has been transferred to *ludovici* as its type-series shows the characteristic dentition of that species. *S. raymondi* has been brought into the synonymy of *simoni* from that of *ludovici*. The original series of *raymondi* consisted of a mixture of both species but the holotype is a very ordinary specimen of *simoni*.

MATERIAL EXAMINED

Nigeria: Olokemeji (*F. Silvestri*). **Ethiopia:** Eritrea, Ghinda (*K. Escherich*). **Kenya:** Cheteni (*Alluaud & Jeannel*). **Burundi:** Imbo Plain (*A. Dejean*). **Uganda:** Entebbe (*G. Arnold*). **Zaire:** Shaba, Lubumbashi (*Bequaert*). **Malawi:** Lk. Nyasa, Urundi (*E. S. Ross & R. E. Leech*); Mzimba (*E. S. Ross & R. E. Leech*). **Zambia:** Kasama (*E. S. Ross & R. E. Leech*). **Mozambique:** Amatongas Forest (*G. Arnold*). **Zimbabwe:** Bulawayo (*G. Arnold*); Sawmills (*G. Arnold*); Victoria Falls (*G. Arnold*); Victoria Falls (*W. L. Brown*). **Matopos** (*G. Arnold*); Harare, Chishawasha (*A. Watscham*). **Angola:** Dundo (*A. Machado*); Benguela, Cuala (*Cruchet*). **Botswana:** Okavango, Maxwee (*A. Russell-Smith*). **South Africa:** Transvaal, Makapan (*E. Simon*); Acornhoek (*Tucker*); Natal, Dukuduku (*I. Trägårdh*); Dukuduku (*W. L. & D. E. Brown*); Durban (*H. B. Marley*); Hlabisa (*J. C. Faure*); Richards Bay (*J. C. Faure*); Sordwana (*J. C. Faure*). **Mauritius:** Corps de Garde Mt (*R. Mamet*).

Serrastruma sulumana sp. n.

HOLOTYPE WORKER. TL 2.0, HL 0.50, HW 0.33, CI 66, ML 0.22, MI 44, SL 0.40, SI 121, PW 0.23, AL 0.58.

Small narrow-headed species with relatively long mandibles and very long scapes. Mandibles slender, serially finely denticulate, the apical tooth subspiniform and the denticles becoming gradually slightly larger towards the base. Rounded angle separating masticatory and basal margins of mandible surmounted by a thin translucent crest which follows the curve and represents the remains of the basal lamella. Anterior clypeal margin translucent and convex, overhung by the false clypeal margin which is equipped with anteriorly projecting hairs. Antennal scrobes vestigial, the dorsum rounding into the sides except in front of the level of the eye where a feebly angular upper scrobe margin remains. The eyes freely visible in full-face view on the ventrolateral margins of the head because of the disappearance of the upper scrobe margins which partially or wholly obscure them in most other members of the genus. Occipital corners evenly rounded, the occipital margin shallowly concave. Antennal scapes very long and slender, subcylindrical, slightly increasing in thickness from base to apex, the leading edges only with fine curved hairs, without bizarre projecting pilosity. Ground-pilosity of head of inconspicuous curved narrowly spatulate hairs. A transverse row of 4 stouter more erect hairs present paralleling the occipital margin but the head without flagellate hairs. Dorsum of head finely and densely reticulate-punctate. Pronotum not marginate laterally, the humeri broadly rounded and each with a long fine flagellate hair. In profile the posterior half of the mesonotum descending steeply to the broadly impressed metanotal groove. Propodeal dorsum elevated behind the level of the metanotal groove then sloping shallowly backwards. Propodeal teeth elevated, long and narrowly triangular, without an infradental lamella. Sides and dorsum of alitrunk evenly and densely reticulate-punctulate everywhere. Dorsal alitrunk with inconspicuous curved narrowly spatulate pilosity, the mesonotum without standing specialized hairs such as are usually seen in *Serrastruma* species. Petiole and postpetiole reticulate-punctate everywhere, the gaster smooth and with vestigial basal costulae. Spongiform appendages of pedicel segments very reduced. In profile the subpetiolar appendage reduced to a narrow translucent strip and the subpostpetiolar lobe represented only by a thin laminar fringe around the curve of the sternite. In dorsal view the petiole and postpetiole each with minute vestiges of their respective transverse posterior spongiform strips, the best developed section being at the posterolateral angles of the postpetiole. Petiole, postpetiole and gaster dorsally with a number of erect to suberect quite stout hairs which are thickened apically. Colour pale yellow.

PARATYPE WORKER. TL not measurable as pedicel segments and gaster missing, HL 0.56, HW 0.36, CI 64, ML 0.25, MI 45, SL 0.46, SI 127, PW 0.24, AL 0.62. As holotype.

Holotype worker, **Cameroun:** nr Yaounde, sample SK (*G. Terron*) (ENSA).

Paratype. 1 worker with same data as holotype (BMNH).

A very distinctive small species of *Serrastruma* immediately separated from all its congeners by its combination of narrow head with relatively long mandibles and extremely long scapes, reduced upper scrobe margins which lack flagellate hairs, inconspicuous cephalic ground-pilosity, presence of humeral flagellate hairs but lack of specialized large hairs on the mesonotum, and vestigial spongiform tissue on the pedicel segments.

***CLADAROGENYS* Brown**

(Fig. 45)

Cladarogenys Brown, 1976: 33. Type-species: *Cladarogenys lasia* Brown, 1976: 34, figs. 1–5, A–D, by original designation.

DIAGNOSIS OF WORKER. Afrotropical dacetine ants. Mandibles elongate and narrow (MI 46), produced into long narrow projecting blades which taper apically, lacking an apical fork of spiniform teeth. Instead the mandible is equipped apically with a crowded series of small denticles and the distal two-thirds of the blade has irregularly spaced minute denticles. Proximal one-third of mandible edentate and lacking a differentiated basal lamella. Antennae with 6 segments, the scapes cylindrical. Orbicular hairs absent.

The single species included in this genus, *C. lasia*, is certainly a direct derivative of *Serrastruma*, separated only by its more specialized mandibles which, whilst appearing longer in *Cladarogenys*, are in fact within the known range of mandible relative length of *Serrastruma* (MI 26–50), and only seem longer because they are narrower. Basically the mandibles are the same as in *Serrastruma*, with a rounded angle separating the basal and masticatory margins and lacking a differentiated basal lamella, but, whereas the continuous rows of denticles on the masticatory margins are opposable in *Serrastruma* throughout the length of the blade, in *Cladarogenys* the narrowing of the blades has meant that the mandibles are only properly opposable at the extreme apex and for most of their length are separated by a gap. This has led to, or has been accompanied by, a reduction in the denticle row down the length of the blades which probably indicates that these areas are no longer used in prey seizure, this function having devolved upon the apical clump of denticles alone.

The remainder of the head and the form of the body in general agree so closely with *Serrastruma* that I doubt whether a separate genus is really necessary for *C. lasia*, and I strongly suspect that a revision of the short-mandibulate dacetine genera on a world wide basis will see the synonymy of *Cladarogenys* under *Serrastruma*. Known only from the holotype collected in Gabon, *C. lasia* has been well described and profusely illustrated by Brown (1976). The following notes (and Fig. 45) are abstracted from that original description.

***Cladarogenys lasia* Brown**

(Fig. 45)

Cladarogenys lasia Brown, 1976: 34, figs 1–5, A–D. Holotype worker, GABON: nr Makokou, Laboratoire de Primatologie et d'Ecologie Equatoriale, ix.–xii.1972, berlesate of rain forest litter and humus (*I. Lieberburg*) (MCZ).

WORKER. TL 3.2, HL 0.70, HW 0.52, CI 74, ML 0.32, MI 46, SL 0.55, SI 106, AL 0.84.

Mandibles as noted under the generic diagnosis and Fig. 45. Anterior clypeal margin prominent medially but not overlapping the bases of the mandibles. Posterodorsal margins of head forming a raised rim which extends to the posterolateral margin, expanded into a small flat truncated tubercle on each side and with a similar but smaller tubercle in front of this, just dorsal to the eye on each side. Dorsum of head densely clothed with simple fine hairs and with a long flagellate hair arising from the tubercle above the eye on each side. Dorsum of head irregularly rugulose, the spaces between the rugulae reticulate-punctate; clypeal dorsum reticulate-punctate. Posterodorsal corners of vertex with a sulcus which parallels the rim and is composed of 3–4 partially confluent foveae with concave shining bottoms. Pronotal humeri bluntly tuberculate and equipped with a pair of long flagellate hairs. Metanotal groove impressed. Pronotal dorsum shining, with quite dense shallow foveolae, the remainder of the dorsal alitrunk reticulate-punctate with superimposed rugulae, some of them enclosing irregular pits. Sides of pronotum finely punctate, mesopleuron finely punctulate and remainder of pleuron smooth; sides of propodeum reticulate-punctate. Petiole and postpetiole punctulate-rugulose. Gaster smooth with conspicuous basal costulae. Entire

dorsum of body densely clothed with fine simple pilosity, and with paired long flagellate hairs on mesonotum and petiole. Postpetiole with several and gaster with more than 30 flagellate hairs.

***EPITRITUS* Emery**

(Figs 46–48)

Epitritus Emery, 1869a: 136. Type-species: *Epitritus argiolus* Emery, 1869a: 136, fig. 1, by monotypy.

DIAGNOSIS OF WORKER. Afrotropical dacetinae ants. Mandibles elongate and linear (MI 31–48), produced into long narrow projecting blades but lacking an apical fork of spiniform teeth. Instead the mandibular apex is equipped with either a more or less vertical array of denticles or with a single apicodorsal spiniform tooth subtended by a row of denticles. Preapical teeth or denticles present or absent. Antennae 4 or 6 segmented. In all Afrotropical species the scape is strongly bent backwards and has a large anteriorly projecting subbasal lobe at the bend. Orbicular hairs present on the head. Labral lobes elongate-conical and visible in full-face view in the space enclosed by the mandibular blades.

In its modern restricted sense *Epitritus*, as redefined by Brown (1949b), contains only seven species restricted to the Old World. Bolton (1972) presented a key dealing with all the species known to that date. Prior to Brown's redefinition a number of unrelated species were associated under *Epitritus* but these were dispersed to various other genera by Brown (1948; 1949b), who also showed (Brown, 1958) that the antennae in this genus may have 4 or 6 segments (until then the known species had 4-merous antennae). Two Afrotropical species originally described in *Epitritus*, *marginatus* and *mandibularis*, which were retained there by Arnold (1917) and Wheeler (1922), were placed in a separate genus, *Miccostruma*, by Brown (1948), a generic name now synonymized under *Smithistruma*.

Apart from the four West African species dealt with here the remaining three show a wide distribution, with *argiolus* Emery from a number of Mediterranean lands, *hexamerus* Brown from Japan, and *murphyi* Taylor from West Malaysia and Sarawak. An undescribed species from Nepal is also known.

The origins of *Epitritus* appear to lie among the short-mandibulate dacetines related to *Smithistruma* rather than with the long-mandibulate allies of *Strumigenys*. Brown (1958) first postulated that *Epitritus* was a long-mandibulate genus independently derived from an ancestral short-mandibulate *Smithistruma*-like stock, and the later description of *Dysedrognathus* by Taylor (1968b) produced a plausible intermediate stage which strengthened the hypothesis.

List of Afrotropical *Epitritus*

laticeps Brown
minimus Bolton

roomi Bolton
tiglath sp. n.

Key to species (workers)

- 1 Antennae with 4 segments. Postpetiole in profile with a large spongiform ventral lobe which is as deep as the height of the postpetiolar node. Minute species, HW 0.29–0.31 (Fig. 46). (Ghana, Cameroun)..... ***minimus*** (p. 355)
- Antennae with 6 segments. Postpetiole in profile without or with a vestigial ventral lobe. Larger species, HW >0.35..... 2
- 2 Tooth at dorsal apex of mandible long and spiniform, strongly crossing over the tooth from the opposite mandible when the blades are closed; MI 35–38, HW >0.50. Area of head immediately behind the posterior clypeal margin without orbicular hairs (Fig. 47). (Ghana, Ivory Coast, Cameroun)..... ***roomi*** (p. 356)
- Tooth at dorsal apex of mandible short, not spiniform, not crossing over the tooth from the opposite mandible when the blades are closed; MI 35–48 but if MI <40 then HW only about 0.39. Orbicular hairs on head present immediately behind the posterior clypeal margin 3
- 3 Dorsal surface of each mandibular blade with two large flattened hairs arising on the distal half. Posterior half of mesonotum not humped in profile. Minute species with shorter mandibles, HW 0.39, MI 35. (Ivory Coast)..... ***tiglath*** (p. 357)
- Dorsal surface of each mandibular blade without flattened hairs arising from them. Posterior half of mesonotum distinctly humped in profile. Larger species with longer mandibles, HW >0.45, MI 42–48. (Ivory Coast, Nigeria, Cameroun)..... ***laticeps*** (p. 355)

***Epitritus laticeps* Brown**

(Fig. 48)

Epitritus laticeps Brown, 1962a: 77, figs 1–4. Holotype and paratype workers, NIGERIA: nr Zungeru on the Kaduna road, 19.xii.1956, base of dead tree, S780 (W. A. Sands) (BMNH; MCZ; USNM) [examined].

WORKER. TL 1.7–2.2, HL 0.40–0.48, HW 0.46–0.59, CI 115–125, ML 0.18–0.22, MI 42–48, SL 0.22–0.29, SI 47–50, PW 0.26–0.32, AL 0.41–0.50 (12 measured).

Mandibular blades with a single preapical denticle, situated close to the apex. Apical armament of mandible consisting of a series of 7–8 denticles, without a conspicuously elongate spiniform tooth at the dorsal end of the series. Dorsal surfaces of mandibular blades naked, without large flattened hairs arising from them. Anterior clypeal margin with 4 long strap-like spatulate hairs which project forwards, the outer pair longer than the inner; and also with a short spatulate hair close to the inner base of each mandibular blade. Clypeus shining, with numerous very small appressed spatulate hairs. Remainder of head finely densely reticulate-punctate and equipped with orbicular hairs which occur from the posterior clypeal margin to the occiput; without a large space behind the clypeus which is free of orbicular hairs. Antennae 6-segmented, the scapes strongly back-curved and with a large anteriorly directed subbasal lobe at the bend, the leading edge with a row of projecting large flattened to spoon-shaped hairs. Alitrunk in profile with the mesonotum strongly humped posteriorly, the highest point of the outline being at or just behind the mesonotal midlength. Anteriorly the mesonotum slopes down to its junction with the pronotum and posteriorly it joins the still more steeply sloped propodeal dorsum. Propodeal declivity bordered by a broad lamella, usually without teeth but rarely an angular tooth is developed, projecting posteriorly from the dorsal end of the lamella. Sides of alitrunk densely reticulate-punctate everywhere. In dorsal view the alitrunk with a very shallow and feeble impression between pronotum and mesonotum and with a distinct transverse line between mesonotum and propodeum, the entire surface densely reticulate-punctate. Alitrunk lacking bizarre pilosity but dorsally with scattered minute simple hairs. Petiole and postpetiole reticulate-punctate. In dorsal view both pedicel segments conspicuously broader than long, the postpetiole with a concave anterior face and a shallow median longitudinal impression. Spongiform appendages vestigial, reduced to a narrow posterior transverse strip on the petiole node, a similar but somewhat broader strip on the postpetiole and with a short strip on the anterior postpetiolar border which traverses the most concave part of the margin. In profile both segments lacking ventral spongiform appendages, the lateral appendage of the postpetiole very reduced and present only at the posterior angle. Dorsal surfaces of pedicel segments with minute hairs as on pronotum, the first gastral tergite with larger long strong hairs which are clavate apically; the surface of the tergite weakly reticulate-shagreened and with short feeble basal costulae. Colour medium brown.

The closest relative of *laticeps* is *tiglath*, which shows most of the characters of *laticeps* including the 6-segmented antennae, lack of a spiniform tooth dorsally in the apical armament of the mandible, orbicular hairs which occur immediately behind the clypeus and vestigial spongiform appendages on the petiole and postpetiole. Features separating the two species are as follows.

laticeps

Larger species with longer mandibles,
HW 0.46–0.59, MI 42–48.
Dorsal surfaces of mandibular blades
lacking large flattened hairs.
Subbasal lobe of scape broad and
bluntly rounded.
Mesonotum strongly swollen and
humped posteriorly.

tiglath

Smaller species with shorter mandibles,
HW 0.39, MI 35.
Dorsal surfaces of each mandibular blade
with two large flattened hairs.
Subbasal lobe of scape narrow and
narrowly rounded.
Mesonotum not swollen, not humped
posteriorly.

MATERIAL EXAMINED

Ivory Coast: Abidjan, Banco Forest (I. Löbl); Adiopodoume (V. Mahnert & J.-L. Perret); Bingerville (V. Mahnert & J.-L. Perret). Gregbeu (V. Mahnert & J.-L. Perret). **Nigeria:** Ibadan (B. R. Critchley); nr Zungeru (W. A. Sands). **Cameroun:** nr Yaounde (G. Terron).

***Epitritus minimus* Bolton**

(Fig. 46)

Epitritus minimus Bolton, 1972: 205, figs 1, 2. Holotype and paratype workers, GHANA: Eastern Region,

Akwapim Dist., Mampong, litter sample in cocoa farm, 27.vii.1970 (*P. M. Room*) (BMNH; MCZ) [examined].

WORKER. TL 1.2, HL 0.29, HW 0.29–0.31, CI 100–107, ML 0.09, MI 31, SL 0.17, SI 55–59, PW 0.20–0.21, AL 0.32 (2 measured).

Mandibles without preapical teeth and without an elongate spiniform tooth at the dorsal apex. Apical armament of mandible a more or less vertical series of 6 small denticles of which the basalmost is the largest, the prebasal approximately half this length and the upper group of 4 only about a quarter the length of the basal. Dorsal surfaces of each mandibular blade with two large flattened hairs, the distal hair slightly smaller than the proximal. Anterior clypeal margin with 4 large flattened hairs which project anteriorly, and with a pair of smaller hairs. Clypeus with minute scale-like hairs only. Dorsum of head with numerous large orbicular hairs which occur from the posterior clypeal margin to the occiput, the dorsum with a narrow median longitudinal strip which is free from such hairs. Head without any other form of pilosity. Antennae with 4 segments, the scape with a very strongly prominent subbasal lobe and fringed with large flattened to spoon-shaped projecting hairs. Eyes minute, of a single ommatidium. Anteromedian portion of clypeus shining, the remainder of the head finely and very densely punctulate-granular and dull. Promesonotum fused in profile, the point of junction marked by a slight impression. Mesonotum behind the impression shallowly convex and weakly inflated, ending posteriorly on a slightly higher level than the propodeum. Propodeal dorsum convex and sloping downwards posteriorly, without teeth or spines but the declivity margined by a conspicuous lamella on each side. Dorsum of pronotum, and to a lesser extent the mesonotum, with scattered minute stubble-like erect hairs which are shorter than the diameter of the propodeal spiracular orifice. In dorsal view the alitrunk densely and finely punctulate-granular everywhere, the shallow impression separating pronotum and mesonotum feebly visible medially, but the mesonotum and propodeum separated by a distinct transverse line. Petiole and postpetiole both broader than long in dorsal view, the latter much broader than the former; the petiole without spongiform appendages and such appendages restricted on the postpetiole to a posterior transverse strip which is broadly interrupted medially. In profile the petiole peduncle ventrally with a small anteriorly situated lamella, without spongiform material. Postpetiole in profile with moderately developed spongiform appendages posterolaterally and with a conspicuous ventral spongiform lobe. Petiole and postpetiole punctulate-granular, with sparse minute hairs such as are present on the pronotum. Gaster with short weak basal costulae, with short erect weakly clavate straight hairs. Colour dull yellow to yellowish brown.

Known only from two series, *minimus* is easily separated from its Afrotropical congeners by its 4-merous antennae, small size and strongly developed spongiform ventral lobes on the postpetiole.

MATERIAL EXAMINED

Ghana: Mampong (*P. M. Room*). **Cameroun:** nr Yaounde (*G. Terron*).

Epitritus roomi Bolton

(Fig. 47)

Epitritus roomi Bolton, 1972: 206, figs 3, 4. Holotype worker and paratype female, GHANA: Eastern Region, Akwapim Dist., Mampong, litter sample in cocoa farm, 10.iv.1970 (*P. M. Room*) (BMNH) [examined].

WORKER. TL 1.8–2.1, HL 0.42–0.47, HW 0.54–0.58, CI 120–129, ML 0.15–0.17, MI 35–38, SL 0.25–0.28, SI 45–48, PW 0.32–0.35, AL 0.46–0.52 (7 measured).

Mandibles with a single short recurved preapical tooth which is situated very close to the apex. Apical armament of mandibular blades consisting of a dorsally situated elongate spiniform tooth, which crosses the opposite mandible at full closure, subtended by an edentate or microscopically serrate lamina and ending ventrally in a denticle. Dorsal surface of each mandibular blade with two large flattened hairs arising on the distal half, the apicalmost hair the largest, the second narrower and tending to be directed towards the midline between the mandibles. Anterior clypeal margin with 4 anteriorly projecting long spatulate or strap-like hairs, the outer pair the longest. A much smaller pair of spatulate hairs also present, projecting forwards from the clypeus between the larger hairs on each side. Clypeus dully shining, equipped with minute appressed spatulate hairs. Remainder of head densely reticulate-punctate and with conspicuous large orbicular hairs. Space on head behind the clypeus free of orbicular hairs, such hairs not commencing immediately behind the posterior clypeal margin. Antennae with 6 segments, the scape with a prominent anteriorly projecting subbasal lobe and fringed with large flattened to spoon-shaped hairs on the leading edges. Alitrunk in dorsal view with a broad but shallow arched impression between pronotum and

mesonotum. Propodeum separated from mesonotum by a feebly impressed line. In profile the dorsal outline of the alitrunk is impressed at the pro-mesonotal junction and the mesonotum is convex posterior to this. Propodeum shallowly convex and sloping downwards posteriorly to the broad laminae which border the declivity. Alitrunk everywhere finely and densely reticulate-punctate and dull. Specialized hairs absent from alitrunk but the dorsum, especially on the pronotum, with a scattered stubble of minute simple hairs. Petiole and postpetiole in dorsal view both distinctly broader than long, the latter with a conspicuous median impression. Spongiform appendages restricted to a narrow lamellar strip behind the petiole node, another behind the postpetiole and one across the anterior margin of the postpetiole which is short and restricted to the median concave portion of the margin. In profile the petiole with a narrow ventral carina, the postpetiole with a vestigial ventral lobe and a larger posterolateral lobe. Pedicel segments and first gastral tergite reticulate-punctate to granular, the latter with short feeble basal costulae but equipped with a number of erect clavate hairs. Colour medium brown.

A very conspicuous species, easily separated from both its Afrotropical congeners which have 6-merous antennae by the form of the mandibles and distribution of orbicular hairs on the head. In *roomi* the mandibular apex terminates dorsally in an elongate spiniform tooth which strongly crosses over its counterpart on the opposite mandible at full closure, and the orbicular hairs do not commence immediately behind the posterior clypeal margin. In both *laticeps* and *tiglath* the mandibles do not have an enlarged spiniform tooth at the dorsal mandibular apex and the orbicular hairs commence immediately behind the posterior clypeal margin.

MATERIAL EXAMINED

Ghana: Mampong (*P. M. Room*). **Ivory Coast:** Issoneu (*V. Mahnert & J.-L. Perret*). **Cameroun:** nr Yaounde (*G. Terron*).

Epitritus tiglath sp. n.

HOLOTYPE WORKER. TL 1.4, HL 0.34, HW 0.39, CI 115, ML 0.12, MI 35, SL 0.20, SI 51, PW 0.25, AL 0.38.

Mandibles each with a single minute preapical denticle which is situated very close to the apex and may be obscured by the flattened hairs. Apical mandibular armament consisting of a series of denticles arranged in a more or less vertical row, the basalmost of which appears to be the largest. Without an elongate spiniform tooth at the dorsal end of the series. Two large flattened hairs arise from the dorsal margin of each mandibular blade on their distal halves; the hair closest to the apex is slightly smaller than the one sited nearer the mandibular midlength. Anterior clypeal margin with 4 large spatulate to strap-like hairs which project anteriorly, the outer pair, at the anterolateral angles, is the longest. A pair of much smaller spatulate hairs also projects from the anterior clypeal margin above the mandibular bases and between the larger hairs. Clypeus dully shining and with minute appressed spatulate hairs. Remainder of head reticulate-punctate to granular and densely clothed with large orbicular hairs which occur from immediately behind the posterior clypeal margin to the highest point of the vertex. Antennae with 6 segments, the scapes with a large anteriorly projecting subbasal lobe and fringed around the leading edges with large flattened to spoon-shaped hairs. Outline shape of head capsule as shown for *laticeps* (Fig. 48). Alitrunk in profile with the anterior portion of the mesonotum extremely shallowly concave, the posterior portion very weakly convex just in front of the narrowly incised metanotal groove, the mesonotum not strongly swollen or humped posteriorly. Propodeal dorsum sloping downwards posteriorly, without teeth but the declivity margined on each side by a broad finely spongiform lamella. In dorsal view the pronotum and mesonotum separated by a shallow impression, the mesonotum and propodeum separated by the conspicuous finely incised line of the metanotal groove. Entire alitrunk finely and densely reticulate-punctate, without specialized hairs but the dorsum with stubble-like microscopic erect simple hairs. Petiole node in dorsal view broader than long, bordered posteriorly by a narrow lamellate strip. Postpetiole broader than long, the anterior margin concave, the posterior margin convex and with a distinct median longitudinal impression. The posterior margin of the postpetiole with a narrow lamellate strip, the anterior margin with a short lamellate strip traversing the most concave portion of the border. Ventral surface of petiole with a narrow longitudinal ridge, the postpetiole ventrally without lamellate or spongiform lobes but posterolaterally with a small spongiform appendage. Both petiole and postpetiole reticulate-punctate to granular and equipped dorsally with minute stubble-like hairs such as are seen on the alitrunk. First gastral tergite with straight hairs which are clavate apically, the basigastral costulae short and weak; sculpture of fine reticulation or shagreening. Colour light yellowish brown.

Holotype worker, **Ivory Coast:** Tai Forest, no. 45, 12.viii.1975, in sample of *Oligomyrmex* sp. (*T. Diomande*) (BMNH).

This small species, the fourth *Epitritus* to be found in sub-Saharan Africa, is closest related to *laticeps*. Characters separating the two are tabulated under *laticeps*.

***STRUMIGENYS* F. Smith**

(Figs 49–66, 68–77)

Strumigenys F. Smith, 1860: 72. Type-species: *Strumigenys mandibularis* F. Smith, 1860: 72, by monotypy.
Labidogenys Roger, 1862: 249. Type-species: *Labidogenys lyroessa* Roger, 1862: 251, pl. 1, fig. 17, by monotypy. [Synonymy by Brown, 1959a: 38.]
Pyramica Roger, 1862: 251. Type-species: *Pyramica gundlachi* Roger, 1862: 253, pl. 1, fig. 18, by monotypy. [Synonymy by Brown, 1959a: 37.]
Proscopomyrmex Patrizi, 1946: 294. Type-species: *Proscopomyrmex londianensis* Patrizi, 1946: 295, figs 1, 2, by monotypy. [Synonymy by Brown, 1949a: 15.]
Eneria Donisthorpe, 1948: 598. Type-species: *Eneria excisa* Donisthorpe, 1948: 598, fig. 1 (= *Strumigenys loriae* Emery), by original designation. [Synonymy by Brown, 1949a: 15.]

DIAGNOSIS OF WORKER. Afrotropical dacetine ants. Mandibles extended into elongate narrow linear blades (MI 26–65) which terminate in an apical fork of two spiniform teeth arranged in a more or less vertical series, the dorsal fork tooth the longest. Intercalary teeth between the fork teeth sometimes present. Each mandibular blade with one to two preapical teeth on the inner margin. Palp formula 1,1. Eyes ventrolateral, below the antennal scrobes. Antennae with 6 segments, sometimes funicular segments 2–3 very reduced. Petiole node not bidentate dorsally. Postpetiole with spongiform appendages present. Specialized body pilosity frequently present.

By far the largest dacetine genus, *Strumigenys* has endemic species in all the zoogeographical regions except the Palaearctic, and in all regions except the Nearctic it has a greater number of species than any other dacetine genus (see table, p. 270).

Modern taxonomic understanding of *Strumigenys* depends almost entirely upon the works of Brown who, beginning in 1948, has sorted the great diversity of forms previously included in the genus and has completed a large number of descriptive, faunistic and revisionary works on *Strumigenys* and its allies, on a world wide basis. Key works in this series include Brown (1948; 1949a; 1949b; 1953a; 1954; 1959a; 1959b; 1962c; 1973c; and their included references), as well as those other papers discussed in the introductory section of the present paper.

The first revisionary treatment of Afrotropical *Strumigenys* was that of Brown (1954), who recognised 14 valid species. Prior to this date the only synthesizing studies of the genus in Africa were those of Arnold (1917) on the South African fauna, and the regional catalogue of Wheeler (1922). Each of these author's concept of *Strumigenys* included members of three genera by modern reckoning, *Strumigenys*, *Smithistruma* and *Serrastruma*; the last two of these being grouped together by Wheeler in a subgenus *Cephaloxys*. Brown (1948) realised that *Strumigenys* as thus constituted contained several discrete evolutionary lines and proceeded to split the genus into the groups which we recognize today. Collections made since Brown's (1954) revision have greatly increased the number of African species, which now stands at 41.

As Brown (1954) indicated, it seems that the entire Afrotropical fauna of the genus belongs in a single species-group, the *rogeri*-group, which has undergone an extensive adaptive radiation in sub-Saharan Africa. The core-species of the group are represented by the *faurei*-complex, and what I assume to be the most generalized character states within the complex (and thus within the group as a whole) are shown by *faurei*, *petiolata* and *rufobrunnea*, as follows.

Mandibles with two preapical teeth on each blade, the proximal of which is the largest; inner margins of blades without tumuli, lamellae or other excrescences. Apical fork of mandible without intercalary teeth, the upper spiniform tooth of the fork longer than the lower, the lower spiniform fork tooth with an extremely minute denticle or prominent angle ventrobasally which may only be visible when the mandibular apices are viewed from behind.

Preocular notch present, the eye detached anteriorly from the side of the head. A ventral preocular impression present behind and separate from the postbuccal impression, the ventral preocular impression running from the preocular notch towards the ventral midline but not reaching the midline.

Eyes relatively large, generally at least equal to the maximum width of the scape. Antennal scapes linear or slightly expanded at about the middle third, not strongly dorsoventrally flattened nor with the leading

edges strongly convex. Mesonotum depressed posteriorly, with a single pair of standing hairs; alitrunk without dense erect standing pilosity.

Upper scrobe margins bordered by a narrow lamina, sinuate or curved in full-face view.

Ground-pilosity small to minute on cephalic dorsum, smaller than the hairs lining the upper scrobe margins.

Flagellate hairs absent from head.

Dorsum of head with 6 standing hairs, arranged in a row of 4 transversely close to the occipital margin, and a more anteriorly situated pair at or close to the highest point of the vertex.

Resembling these very closely are the three species *pretoriae*, *shaula* and *dromoshaula*, which conform to the above characterization but have the upper scrobe margins diverging posteriorly almost in a straight line. In *pretoriae* the eyes are very large and the pronotal humeri lack the flagellate hairs shown in the other two. Completing the *faurei*-complex is a cluster of seven species which shows a gradual reduction and loss of the preocular notch and ventral preocular impression whilst retaining the other characters listed above. Of these seven *relahyla*, *dyshaula*, *xenohyla* and *totyla* show a small preocular notch; *adrasora* and *rukha* have the notch vestigial to absent, variably developed even in a single series; absent in *ettillax*. Also in these seven a tendency to broaden and flatten the antennal scapes is shown, perhaps best developed in *xenohyla*.

Closely related to the 13 species of the *faurei*-complex is a species-pair consisting of *bernardi* and *vazerka* which, whilst retaining most of the listed characters, have narrowed the head and lengthened the mandibles and scapes beyond the range shown by the *faurei*-complex, thus.

	CI	MI	SI
<i>faurei</i> -complex	70–83	40–54	59–77
<i>bernardi</i> + <i>vazerka</i>	65–72	50–65	79–92

In the *rogeri*-complex (*cacaoensis*, *londianensis*, *sarissa*, *rogeri*) the upper scrobe margins lack a bordering lamina, are strongly pinched in behind the frontal lobes and are concave to deeply indented above the eyes. The scapes are long and slender. *S. rogeri* forms an intermediate stage between the generalized condition shown in the *faurei*-complex and the more strongly modified remaining members of the *rogeri*-complex both in terms of the condition of the upper scrobe margin and in the dentition. In *rogeri* the mandibles are armed as defined above, but in *cacaoensis*, *sarissa* and *londianensis* intercalary teeth are present at least in the left apical fork, and the preapical teeth are modified. In *cacaoensis* the proximal preapical teeth are reduced, at most as large as the distals and usually smaller. In *sarissa* and *londianensis* the left mandible has lost its distal preapical tooth. The cephalic ground-pilosity in *rogeri* is as in *faurei* and its allies, whereas in the remaining species of the *rogeri*-complex the hairs lining the upper scrobe margins are no broader than the ground-pilosity of the dorsum.

Perhaps derived from the *rogeri*-complex the five species of the *scotti*-complex (*scotti*, *hastyla*, *zandala*, *murshila*, *helytruga*) lack a lamina on the upper scrobe margin, have elongate cylindrical scapes (SI 75–95), and have the hairs lining the upper scrobe margins slender, not or only fractionally larger than the cephalic ground-pilosity. The mandibles are as defined for the *faurei*-complex but the preocular notch is vestigial or absent and there is no ventral preocular impression in the head. The eyes are relatively large in the first three species listed but are much reduced in *murshila* and *helytruga*.

The 15 species of the *arnoldi*-complex themselves show a wide range of adaptations but appear to be derived as a unit from ancestral forms related to *relahyla* and *ettillax* in the *faurei*-complex. In the *arnoldi*-complex all species lack a preocular notch and ventral preocular impression, have the eyes very small or vestigial (much smaller than the maximum width of the scape), and show the development of conspicuous scale-like cephalic ground-pilosity. Within the complex *havilandi* and *korahyla* have retained the relatively long mandibles of the ancestral *faurei*-complex and have increased the scape length, so that their respective indices are MI 45–50, SI 80–90, as opposed to MI 26–45, SI 52–75 in the remainder of the *arnoldi*-complex. The central species of the complex, represented by *arnoldi*, *bitheria*, *omalyx*, *traegaordhi*, *mesahyla*, *stygia* and *nimbrata*, retain the mandibular dentition described for *faurei* but in *dextra*, *paranax*

and *katapelta* the distal preapical tooth of the left mandible has been lost, and in *irrorata* the distal preapical tooth of the right mandible is also missing. In all these species the antennal scapes tend to be dorsoventrally flattened and have the leading edge arched convex. This character is taken to extremes in *tetraphanes* where the leading edge of the scape is massively expanded into a forward pointing lobe. In the *arnoldi*-complex in general there is an irregular trend towards broadening the head and shortening the mandibles as one moves away from the species closest to the *faurei*-complex, as follows.

	CI	MI
<i>haviglandi</i> + <i>korahyla</i>	67–74	45–50
<i>dextra</i> + <i>paranax</i>	70–77	37–41
<i>omalyx</i> + <i>stygia</i>	74–84	35–41
<i>spathoda</i> + <i>tetraphanes</i>	77–97	26–37

It is certain that *Quadristruma emmae* represents a continuation of this trend (CI 80–85, MI 26–32), further specialized by the development of cephalic orbicular hairs and the loss of the two smallest funicular segments (numbers 2 and 3) so that the antennae have only 4 segments in all (Fig. 67). This last specialization is not shown in the species listed above, but in *nimbrata* funicular segments 2 and 3 are vestigial and often difficult to discern.

Finally the *marleyi*-complex (*marleyi* and *pallestes*), although related to the above and most probably developed from them, has a striking overall convergence to the members of the Oriental and Indo-Australian *lyroessa*-group (see Brown, 1948). As in the *arnoldi*-complex the preocular notch and ventral preocular impression are absent in the *marleyi*-complex, and the scale-like pilosity is also present on the head. The eyes, however, are relatively larger in *marleyi* and *pallestes* and the mandibular basal areas are much broadened and have an accentuated basal-external angle. Additional teeth have developed on the mandibular apical fork, growing from the ventral base of the lower spiniform fork tooth. The preapical mandibular armament is as in the *faurei*-complex. Both members of this complex are arboreal, a feature shared only with *cacaoensis* in the Afrotropical fauna.

List of Afrotropical *Strumigenys*

rogeri-group

adrasora sp. n.
arnoldi Forel
bernardi Brown
bithertia sp. n.
cacaoensis Bolton
dextra Brown
dromoshaula sp. n.
dysshaula sp. n.
ettillax sp. n.
faurei Arnold sp. rev.
hastyla sp. n.
haviglandi Forel
helytruga sp. n.
irrorata Santschi
katapelta sp. n.
korahyla sp. n.
londianensis (Patrizi)
marleyi Arnold
mesahyla sp. n.
murshila sp. n.
nimbrata sp. n.

omalyx sp. n.
pallestes Bolton
paranax sp. n.
petiolata Bernard sp. rev.
pretoriae Arnold
relahyla sp. n.
rogeri Emery
incisa Godfrey
sulfurea Santschi
rufobrunnea Santschi
rukha sp. n.
sarissa sp. n.
scotti Forel
shaula sp. n.
spathoda sp. n.
stygia Santschi
tetraphanes Brown
totyla sp. n.
traegaordhi Santschi
vazerka sp. n.
xenohyla sp. n.
zandala sp. n.

Key to species (workers)

- 1 Preocular notch present; the ventrolateral margin of the head impressed, notched or indented immediately in front of the eye, even if only feebly so (Figs 49–58, 71–74)
- Preocular notch absent; the ventrolateral margin of the head continuous to the anterior margin

- of the eye, without trace of an impression, notch or indentation immediately in front of the eye (Figs 59–66, 75–77) 21
- 2 Blade of left mandible with 1 preapical tooth 3
- Blade of left mandible with 2 preapical teeth 5
- 3 Apical fork of left mandible without an intercalary small tooth between the spiniform fork teeth. Small species with relatively slightly longer mandibles, HW 0.36–0.41, MI 55–65. (Cameroun, Gabon, Zaire, Angola) *bernardi* (part, p. 366)
- Apical fork of left mandible with an intercalary small tooth between the spiniform fork teeth (Fig. 50). Larger species with relatively slightly shorter mandibles, HW 0.50–0.70, MI 51–55 4
- 4 Pronotal humeri with straight feebly clavate stout hairs, the anterior pronotal margin without a second pair of hairs between the humeral pair. Propodeum without sharp teeth. Leading edge of scape with hairs on the proximal half directed basally (except for the 2 basalmost), hairs on the distal half directed apically. (Kenya) *londianensis* (p. 377)
- Pronotal humeri with fine flagellate hairs and the anterior pronotal margin with a second pair of stouter hairs between the humeral pair. Propodeum with sharp teeth. All hairs on leading edge of scape directed apically (Fig. 50). (Zaire, Rwanda, Burundi) *sarissa* (p. 390)
- 5 Apical fork of left mandible with a strong intercalary tooth and a denticle between the spiniform fork teeth (Fig. 49). With the head in full-face view the upper scrobe margin strongly notched above the eye. Large species, HW >0.60, with the preapical teeth about equal in size or the distal larger than the proximal. (Ghana, Nigeria) *cacaoensis* (p. 367)
- Apical fork of left mandible without intercalary tooth or denticle between the spiniform fork teeth. With the head in full-face view the upper scrobe margin continuous above the eye. Smaller species, HW <0.60, with the proximal preapical tooth larger than the distal 6
- 6 Preocular notch on each side continued onto the ventral surface of the head as a transverse impression or groove of varying length, which runs towards but does not reach the midline; this impression situated behind the post-buccal groove or impression and independent of it (Figs 71, 72) 7
- Preocular notch on each side not continued onto the ventral surface of the head, the ventral surface convex and without impressions behind the post-buccal groove or impression (Figs 73, 74) 15
- 7 Antennal scapes relatively long, SI 79–92 8
- Antennal scapes relatively short, SI 64–74 10
- 8 Mandibles more or less straight in full-face view, not conspicuously bowed outwards (Fig. 51). Larger species, HW 0.42–0.52. (Cosmopolitan tramp species, very widespread in Afrotropical region) *rogeri* (p. 387)
- Mandibles conspicuously bowed outwards in full-face view (Fig. 52). Smaller species, HW 0.36–0.41 9
- 9 Dorsum of propodeum densely reticulate-punctate and dull. (Cameroun, Gabon, Zaire, Angola) *bernardi* (part, p. 366)
- Dorsum of propodeum smooth and shining. (Ivory Coast, Ghana, Nigeria) *vazerka* (p. 397)
- 10 Eyes very large, their maximum diameter 0.23–0.24×HW or more (Fig. 53). (Botswana, South Africa) *pretoriae* (p. 385)
- Eyes smaller, the maximum diameter less than 0.20×HW 11
- 11 Pronotal humeri without flagellate hairs. (Guinea, Ivory Coast, Ghana, Nigeria, Cameroun, Gabon, Angola, Sudan, Central African Republic) *petiolata* (p. 384)
- Pronotal humeri with flagellate hairs 12
- 12 Disc of postpetiole very finely and densely longitudinally superficially sculptured. (South Africa) *faurei* (p. 371)
- Disc of postpetiole smooth and shining (when clean, frequently the surface with a waxy bloom present) 13
- 13 Distal preapical tooth of left mandible short and separated from the proximal by a distance which at least is equal to the length of the distal tooth but which is usually much more. (Guinea, Ivory Coast, Togo, Nigeria) *rufobrunnea* (p. 389)
- Distal preapical tooth of left mandible long and separated from the proximal by a distance which is distinctly much less than the length of the distal tooth 14
- 14 Extension of preocular notch on ventral surface of head forming a parallel-sided groove which is narrower than the maximum diameter of the eye; the edges of the groove sharply defined. (Zimbabwe) *shaula* (p. 392)
- Extension of preocular notch on ventral surface of head forming a broad dish-like impression

- which is at least as broad as the maximum diameter of the eye and usually broader; the edges of this impression are rounded and not sharply defined. (Burundi) **dromoshaula** (p. 369)
- 15 Eyes small, with only 8 ommatidia. Mandibles in full-face view with outer margins of blades straight. Antennal scapes with SI 79. (Angola) **helytruga** (p. 374)
- Eyes larger, with more than 8 ommatidia. Mandibles in full-face view with outer margins of blades convex, the mandibles usually bowed outwards. Antennal scapes with SI 65–77 16
- 16 Pronotal humeri without flagellate hairs. (Cameroun) **totyla** (p. 395)
- Pronotal humeri with flagellate hairs 17
- 17 In full-face view the projecting hairs on the leading edges of the scapes large and broadly spoon-shaped, about equal in size to the large broadly spoon-shaped hairs fringing the upper scrobe margins. Upper scrobe margins with a broad lamellate rim or flange (Fig. 54). (Cameroun, Zaire) **xenohyla** (p. 398)
- In full-face view the projecting hairs on the leading edges of the scapes slender, either distinctly narrower than those fringing the upper scrobe margins or with the hairs in both places conspicuously slender, spatulate to narrowly elongate spoon-shaped. Upper scrobe margins with a narrow rim or flange 18
- 18 In profile the area of the ventral postpetiolar spongiform lobe conspicuously much less than the visible area of the postpetiolar disc (Fig. 68). Infradental lamellae of propodeum very narrow or vestigial, the teeth free or nearly free of the lamellae. (Rwanda, Burundi) **adrasora** (part, p. 364)
- In profile the area of the ventral postpetiolar spongiform lobe equalling or exceeding the visible area of the postpetiolar disc. Infradental lamellae of propodeum broad, engaging half or more of the length of the teeth 19
- 19 With the postpetiole in dorsal view spongiform material is visible projecting laterally at and in front of the midlength of the disc. (Uganda, Kenya) **rukha** (part, p. 389)
- With the postpetiole in dorsal view projecting spongiform material is restricted to the apices of the posterior transverse strip and does not occur in front of the midlength of the disc 20
- 20 Basigastral costulae sparse and forming a continuous row across the tergite, without a broad clear central area and usually without secondary fine costulae arising some distance behind the basal strip of the tergite. Scapes shorter, SI 65–69. Occipital margin broadly and shallowly impressed (Fig. 57). (Cameroun, Zaire, Angola) **relahyla** (p. 386)
- Basigastral costulae dense and very obviously radiating from each side of a broad clear central area, with secondary fine costulae present which arise some distance behind the basal strip of the tergite. Scapes longer, SI 70–74. Occipital margin narrowly and deeply impressed (Fig. 55). (Zimbabwe) **dyshaula** (p. 370)
- 21 Blade of left mandible with 1 preapical tooth 22
- Blade of left mandible with 2 preapical teeth 25
- 22 Blade of right mandible with 1 preapical tooth. (Zimbabwe, South Africa) **irrorata** (p. 375)
- Blade of right mandible with 2 preapical teeth 23
- 23 Apical fork of left mandible with an intercalary denticle between the spiniform teeth. Dorsum of head without a transverse row of 4 standing hairs close to the occipital margin. Head broad, CI 85–90 (Fig. 61). (Burundi, Kenya) **katapelta** (p. 375)
- Apical fork of left mandible without an intercalary denticle between the spiniform teeth. Dorsum of head with a transverse row of 4 standing hairs close to the occipital margin and with a pair situated anterior to this row. Head narrower, CI <80 24
- 24 Pronotal humeri each with a straight stout thickly clavate projecting hair. (Cameroun, Gabon) **paranax** (p. 383)
- Pronotal humeri each with a long fine flagellate projecting hair. (Cameroun, Gabon, Angola, Central African Republic, Uganda) **dextra** (p. 368)
- 25 Ventral tooth of left mandibular apical fork with an adventitious tooth and an intermediate denticle arising from its ventrobasal surface (Fig. 59). Sides of alitrunk densely reticulate-punctate everywhere. Arboreal species 26
- Ventral tooth of left mandibular apical fork without additional teeth arising from the ventrobasal surface or at most with an extremely minute denticle-like point at the extreme base. Sides of alitrunk usually with at least the pleurae smooth and shining, not densely reticulate-punctate everywhere 27
- 26 Pronotal humeri each with a stout straight laterally directed hair which is clavate apically. Petiole node weakly transversely striate dorsally. (Ghana, Nigeria) **pallestes** (p. 383)
- Pronotal humeri without projecting hairs of any description. Petiole node punctate dorsally. (South Africa) **marleyi** (p. 378)

- 27 Pronotal humeri without flagellate hairs 28
- Pronotal humeri with flagellate hairs 31
- 28 Leading edge of antennal scape grossly expanded into an enormous anteriorly projecting lobe (Fig. 60). (Uganda, Cameroun, Gabon) *tetraphanes* (p. 395)
- Leading edge of antennal scape not expanded into a gross projecting lobe 29
- 29 Antennal scape broadest close to the base, thereafter evenly tapering to the apex (Fig. 64). Mandibles and scapes longer, head narrower, MI 48–50, SI 82–85, CI 67–71. (Cameroun) *korahyla* (p. 376)
- Antennal scape broadest at or just beyond the midlength, narrowing both proximally and distally (Fig. 63). Mandibles and scapes shorter, the head broader, MI 35–41, SI 65–75, CI 74–84 30
- 30 Postpetiolar disc smooth and shining. (Zimbabwe, Kenya) *arnoldi* (p. 365)
- Postpetiolar disc sculptured. (Kenya) *omalyx* (p. 382)
- 31 Funicular segments 2 and 3 vestigial and difficult to see so that the funiculus appears to have only 3 segments altogether. Combined length of funicular segments 2 and 3 less than half the length of segment 4 (the penultimate segment) 32
- Funicular segments 2 and 3 reduced but easily visible, the funiculus distinctly with 5 segments. Combined length of funicular segment 2 and 3 more than half the length of segment 4 33
- 32 Width of lamellate flange bordering upper scrobe margins distinctly greater than the maximum diameter of the eye, approaching the maximum width of the scape. Petiole node in dorsal view as broad as long. (Cameroun) *bithertia* (p. 367)
- Width of lamellate flange bordering upper scrobe margins distinctly less than the maximum diameter of the eye, only a fraction of the maximum width of the scape. Petiole node in dorsal view much broader than long. (Ivory Coast, Ghana) *nimbrata* (p. 381)
- 33 Disc of postpetiole sculptured 34
- Disc of postpetiole smooth and shining (when clean, frequently with a waxy bloom present) 35
- 34 Ground-pilosity of head, upper scrobe margins and leading edges of scapes of narrow spatulate hairs. Scapes slender and cylindrical, the leading edges not expanded and convex. MI 48, SI 77, CI 76. (Rwanda) *murshila* (p. 380)
- Ground-pilosity of head, upper scrobe margins and leading edges of scapes of broadly spoon-shaped or scale-like to suborbicular hairs. Scapes flattened, the leading edges expanded and convex. MI 36–40, SI 63–68, CI 80–84. (Kenya, Zimbabwe, Cameroun, Angola) *stygia* (p. 394)
- 35 Maximum diameter of eye distinctly much less than maximum width of scape 36
- Maximum diameter of eye at least equal to and usually distinctly greater than maximum width of scape 39
- 36 Mandibles and scapes very short, MI 26–30, SI 55–61 (Fig. 62). (Ivory Coast, Togo, Cameroun) *spathoda* (p. 393)
- Mandibles and scapes longer, MI 42–50, SI 70–90 37
- 37 Scapes long, SI 80–90. Proximal preapical tooth of left mandible situated close to midlength of the blade so that the distance from the basal midpoint of the tooth to the clypeal margin is less than twice the distance from the basal midpoint of the tooth to the distal base of the dorsal fork tooth (Fig. 65). (South Africa) *havilandi* (p. 373)
- Scapes shorter, SI 70–75. Proximal preapical tooth of left mandible situated far along the blade so that the distance from the basal midpoint of the tooth to the clypeal margin is more than twice the distance from the basal midpoint of the tooth to the distal base of the dorsal fork tooth 38
- 38 Dorsum of head with 6 standing hairs. Cephalic ground-pilosity much narrower on the posterior half of the head than on the anterior half, the former narrowly spatulate, the latter spoon-shaped to scale-like. Ventral spongiform lobe of postpetiole at most equal to the exposed area of the postpetiolar disc in profile. (South Africa) *traegaordhi* (p. 396)
- Dorsum of head with 4 standing hairs. Cephalic ground-pilosity spoon-shaped to scale-like everywhere, not much narrower on the posterior half of the head. Ventral spongiform lobe of postpetiole much larger than the exposed area of the postpetiolar disc in profile (Fig. 69). (Zimbabwe) *mesahyla* (p. 379)
- 39 Ventral spongiform lobe of postpetiole in profile distinctly smaller than the exposed area of the postpetiolar disc (Fig. 68). Ventral appendage of petiole not spongiform. (Rwanda, Burundi) *adrasora* (part, p. 364)
- Ventral spongiform lobe of postpetiole in profile as large as or larger than the exposed area of

- the postpetiolar disc. Ventral appendage of petiole spongiform 40
- 40 Upper scrobe margins fringed by many inconspicuous fine spatulate to narrowly spoon-shaped hairs which are the same size as the hairs of the cephalic ground-pilosity (Fig. 66). Head narrower and scapes longer, CI 64–75, SI 74–95 41
- Upper scrobe margins fringed by few conspicuous broadly spatulate to spoon-shaped large hairs which are distinctly much larger than the minute hairs of the cephalic ground-pilosity. Head broader and scapes shorter, CI 75–81, SI 59–73 43
- 41 Mandibles and scapes long, MI 46–50, SI 88–95. Petiole node in dorsal view at least as long as broad, often longer than broad. (São Tomé I., Seychelles) *scotti* (p. 391)
- Mandibles and scapes shorter, MI 42–46, SI 75–82. Petiole node in dorsal view broader than long 42
- 42 In dorsal view some or all of the hairs on the petiole, postpetiole and base of the first gastral tergite thickened or clavate. Smaller species, HW 0.34–0.39. (Ivory Coast, Nigeria, Cameroun, Gabon, Angola, Burundi) *hastyla* (p. 372)
- In dorsal view all hairs on the petiole, postpetiole and base of the first gastral tergite simple. Larger species, HW 0.42–0.44. (Annobon I.) *zandala* (p. 399)
- 43 Yellow species with longer mandibles and scapes, MI 47–49, SI 67–73. (Uganda, Kenya) *rukha* (part, p. 389)
- Blackish brown species with shorter mandibles and scapes, MI 40–43, SI 59–60. (Cameroun) *ettillax* (p. 371)

Strumigenys adrasora sp. n.

(Fig. 68)

HOLOTYPE WORKER. TL 2.4, HL 0.60, HW 0.45, CI 75, ML 0.32, MI 53, SL 0.33, SI 73, PW 0.29, AL 0.58.

Mandibles in full-face view evenly shallowly bowed outwards. Apical fork of each mandible consisting of two spiniform teeth, the upper largest, without intercalary teeth or denticles. Each mandibular blade with 2 preapical teeth, the proximal the largest. The distal tooth approximately half the length of the proximal and slightly shorter to about equal in length to the distance separating their bases. Upper scrobe margins not bordered by a projecting flange, the eyes visible in full-face view. Maximum diameter of eye slightly greater than maximum width of scape. Preocular notch present but small and shallow, not continued onto the ventral surface of the head as a transverse impression or groove. Antennal scapes slender, very shallowly curved basally, their leading edges equipped with a row of elongate narrowly spatulate hairs which are curved apically. Upper scrobe margins with an anteriorly curved row of elongate spatulate hairs which are narrow, only fractionally broader than those on the scapes. Dorsum of head with 6 standing hairs arranged in a transverse row of 4 close to the occipital margin and a more anteriorly situated pair. Cephalic ground-pilosity of inconspicuous simple short hairs anteriorly but with the hairs tending to become narrowly spatulate on the occipital lobes. Dorsum of head reticulate-punctate. Pronotal humeri each with a single long fine flagellate hair. Mesonotum with a single pair of standing hairs. Dorsal alitrunk otherwise only with sparse minute ground-pilosity which is appressed. Metanotal groove obsolete, scarcely discernible on the dorsal alitrunk and not impressed in profile. Posterior portion of mesonotum only shallowly depressed behind the level of the standing hairs. Propodeal teeth lamellate and narrowly triangular, the infradental lamella narrow, engaging one-quarter or less of the length of the tooth. Sides of pronotum with faint sculpture anteriorly and posteriorly but smooth medially. Pleurae mostly glassy smooth but with peripheral weak punctulation. Sides of propodeum below the level of the spiracle punctate. Pronotum dorsally very finely longitudinally striolate-costulate, the remainder of the dorsal alitrunk punctate. Petiole node punctate dorsally, the postpetiole mostly smooth but with faint vestiges of shagreening towards the sides. Spongiform appendages of pedicel segments very reduced, the subpetiolar strip vestigial, commencing only at the midlength of the peduncle. Ventral lobe of postpetiole small, in profile distinctly smaller than the exposed portion of the postpetiole and about the same size as the lateral spongiform lobe. In dorsal view the petiole node with a narrow posterior collar, the postpetiole with a narrow posterior strip; the sides in front of the midlength not showing projecting spongiform tissue. Base of first gastral tergite with a narrow lamellate strip from which the basigastral costulae arise. Petiole, postpetiole and first gastral tergite with stout standing hairs, most of which are thickened apically. Colour blackish brown to black.

PARATYPE WORKERS. TL 2.3–2.4, HL 0.59–0.62, HW 0.44–0.47, CI 73–78, ML 0.30–0.33, MI 50–54, SL 0.33–0.36, SI 72–77, PW 0.29–0.31, AL 0.58–0.62 (10 measured).

As holotype but in some the preocular notch is vestigial and very difficult to see, to all intents and purposes absent. In most the distal preapical tooth is as described above but in a few is distinctly shorter than the distance separating the bases of the two preapical teeth. The subpetiolar spongiform appendage

may be reduced to a small lobe under the node or reduced to a narrow short carina. In a few individuals the propodeal teeth are almost free of the infradental lamellae.

Holotype worker, **Rwanda**: Rangi, ix. 1976 (*P. Werner*) (MHN).

Paratypes. 26 workers with same data as holotype (MHN; MCZ; BMNH; ENSA).

Non-paratypic material examined. **Burundi**: Bujumbura (*A. Dejean*); Bugarama (*A. Dejean*).

The non-paratypic material is lighter than the type-series, being yellowish brown with a dark brown gaster, but otherwise matches the above description. *S. adrasora* belongs to the *faurei*-complex where it is diagnosed by its poorly defined to vestigial preocular impression, reduced spongiform appendages on the pedicel segments and narrow hairs on the upper scrobe margins. The variably developed preocular notch has led me to key this species in two places, firstly amongst the *faurei*-complex members where it really belongs, but secondly amongst the members of the *scotti*-complex towards the end of the key, where its close relatives *rukha* and *etillax* also occur. *S. adrasora* is separated from all of these forms by its reduced spongiform appendages on the pedicel segments.

Strumigenys arnoldi Forel

Strumigenys arnoldi Forel, 1913b: 114. Holotype worker, ZIMBABWE: Bulawayo, under stone in nest of *Bothroponera krugeri* (Forel) (*G. Arnold*) (MHN) [examined].

Strumigenys arnoldi Forel; Brown, 1954: 26.

WORKER. TL 2.0–2.1, HL 0.54–0.60, HW 0.39–0.46, CI 74–78, ML 0.22–0.23, MI 38–41, SL 0.30–0.32, SI 68–75, PW 0.24–0.26, AL 0.54–0.58 (3 measured).

Mandibles in full-face view broadest near the base and gradually tapering towards the apex. Apical fork of each mandible with 2 spiniform teeth, without intercalary teeth or denticles. Preapical armament of each mandibular blade of 2 teeth, the proximal preapical much longer than the distal and the distance separating their bases less than the height of the distal preapical tooth. Both preapical teeth situated in the apical third of the length of the blade. Upper scrobe margins forming a feeble rim or flange, the eyes not visible in full-face view. Eyes small, the maximum diameter distinctly less than the maximum width of the scape. Preocular notch absent, the ventral surface of the head without a preocular transverse impression or groove on each side. Antennal scapes shallowly curved in the basal third, the leading edges weakly convex and equipped with a row of apically curved spoon-shaped hairs which are about the same size as those fringing the upper scrobe margins. Dorsum of head with dense anteriorly curved hairs which are scale-like to stud-like in full-face view, the upper scrobe margins fringed with similar hairs. Dorsum of head everywhere finely and densely reticulate-punctate. Pronotal humeri without flagellate hairs. Mesonotum with a single pair of stout standing hairs. Ground-pilosity of dorsal alitrunk like that of cephalic dorsum but the hairs tending to be smaller and sparser. Posterior portion of mesonotum depressed, the metanotal groove absent. Propodeal teeth broadly triangular and conspicuous, subtended by broad sinuate infradental lamellae. Sides of alitrunk smooth except for some punctures on the upper portion of the mesopleuron. Entire dorsal alitrunk finely reticulate-punctate, on the pronotum this sculpture overlaid by some fine longitudinal rugulation. Dorsum of petiole node finely punctate, the postpetiolar disc smooth and shining. Spongiform appendages of pedicel segments well developed, the petiole with a broad ventral strip which has its ventral free margin indented before the midlength. Ventral spongiform lobe of postpetiole larger than the exposed area of the postpetiolar disc in profile and distinctly larger than the lateral spongiform lobe. Basigastral costulae short and sparse, widely spaced on each side of a broad central clear area. Petiole, postpetiole and first gastral tergite with stout standing hairs which are swollen to clavate apically. Colour dull yellow.

Within the *arnoldi*-complex the species *tetraphanes*, *korahyla*, *arnoldi* and *omalys* are characterized by lacking pronotal flagellate hairs whilst retaining the usual mandibular dentition of 2 preapical teeth on each blade. Of the four *tetraphanes* is instantly recognized by its short broad head and enormous plate-like lobate extension of the antennal scapes. *S. korahyla* has long narrow mandibles and scapes (MI 48–50, SI 82–85), and has the scapes evenly tapering from base to apex. *S. arnoldi* is separated from *omalys* by details of sculpture as in the latter the sides of the pronotum and the postpetiolar disc are strongly sculptured, and the reticulate-punctate sculpture of the pronotal dorsum is not overlaid by longitudinal rugulae. In *arnoldi*, on the other hand, the pronotal sides and postpetiolar disc are smooth, and the pronotal dorsum has longitudinal rugulae overlying the reticulate-punctate sculpture.

MATERIAL EXAMINED

Zimbabwe: Bulawayo (*G. Arnold*). **Kenya:** Eldoret (*Patrizi*).

Strumigenys bernardi Brown

Strumigenys new species, Bernard MS; Brown, 1954: 16 (described but not named).

Strumigenys bernardi Brown, 1960: 206. Holotype worker, ZAIRE: 10 miles (16 km) E. of Stanleyville (= Kisangani), iii.1948, no. 2225 (*N. A. Weber*) (MCZ) [examined]

WORKER. TL 1.7–2.1, HL 0.52–0.58, HW 0.36–0.41, CI 67–72, ML 0.30–0.36, MI 55–65, SL 0.30–0.36, SI 82–92, PW 0.22–0.26, AL 0.44–0.54 (25 measured).

Mandibles long and slender, conspicuously bowed outwards in full-face view. Apical fork of both mandibles without intercalary denticles. Left mandible usually with only a single spiniform preapical tooth (the proximal) but extremely rarely a minute almost invisible distal preapical denticle can be seen very close to the dorsal tooth of the apical fork. Right mandible with 2 preapical teeth, the proximal much longer than the distal and the latter frequently concealed by the opposing upper fork tooth when the mandibles are closed. Upper scrobe margins close together immediately behind the frontal lobes, usually feebly sinuate close to the frontal lobes and then evenly divergent behind, not concave or impressed above the eyes and without a conspicuous bordering lamella or flange. Preocular notch strongly developed and deep, the anterior portion of the eye detached from the side of the head. Preocular notch continuing onto ventral surface of head as a transverse impression. Maximum diameter of eye equal to or greater than maximum width of scape. Antennal scapes straight and slender, the leading edge with a row of apically curved narrowly spatulate hairs. Cephalic ground-pilosity of inconspicuous narrowly spatulate hairs which are curved anteriorly. Laterally projecting curved spatulate to spoon-shaped hairs which border the upper scrobe margins distinctly larger than the ground-pilosity. Vertex of head with 6 standing hairs arranged in a row of 4 close to the occipital margin and a more anteriorly situated pair. Dorsum of head finely and shallowly reticulate-punctate everywhere. Pronotal humeri each with a long fine flagellate hair and the mesonotum with a single pair of stout standing hairs. Ground-pilosity on alitrunk minute and appressed. Metanotal groove represented by a transverse line on the dorsum, not or only vestigially impressed in profile. Posterior portion of mesonotum depressed and on same level as propodeum, the latter armed with a pair of triangular teeth subtended by narrow infradental lamellae. Pleurae of alitrunk smooth and shining or at most with faint peripheral punctulae. Sides of propodeum usually punctate, less commonly virtually unsculptured. Pronotal dorsum usually with fine longitudinal rugulae which diverge posteriorly and are superimposed on a punctate ground-sculpture, but one or the other component may be emphasised so that at one extreme the pronotum is punctate dorsally and at the other almost entirely rugulose. Mesonotum and propodeum reticulate-punctate dorsally. Petiole node punctate dorsally, the postpetiole smooth or weakly sculptured, often with feeble longitudinal costulae and sometimes with vestigial punctures. Petiole with a vestigial ventral appendage which at most is represented by a narrow carina, the node posteriorly with a slender transverse collar. Ventral spongiform lobe of postpetiole moderately developed, larger than the lateral lobe in profile. In dorsal view the postpetiole with a very narrow anterior and broader posterior spongiform strip. Base of first gastral tergite with a narrow lamellar strip from which the basigastral costulae arise. Petiole, postpetiole and gaster with strong hairs which are weakly clavate apically. Colour dull yellow.

Among the Afrotropical *Strumigenys* in which the preocular notch is developed *bernardi* and *vazerka* form a close species-pair characterized by their long bowed mandibles, long scapes, lack of intercalary teeth in the mandibular apical forks, and by having the preocular notch continued as an impression on the ventral surface of the head. Most samples of *bernardi* are instantly distinguishable from *vazerka* as the former has only a single preapical tooth on the left mandibular blade whilst the latter has two. However, now and again a specimen of *bernardi* with a minute vestige of the left distal preapical tooth is found, but here *bernardi* is recognized by its reticulate-punctate propodeal dorsum, which in *vazerka* is smooth.

MATERIAL EXAMINED

Cameroun: Nkoemvon (*D. Jackson*); nr Yaounde (*G. Terron*). **Gabon:** Plateau d'Ipassa (*J. A. Barra*); Makokou (*W. H. Gotwald*); Makokou (*I. Lieberburg*). **Zaire:** Ituri Forest (*N. A. Weber*); Stanleyville (*N. A. Weber*). **Angola:** R. Kahingo; R. Chicapa, Saurimo (*L. de Carvalho*); Dundo (*L. de Carvalho*); Camudembele (*L. de Carvalho*); R. Mussungue (*L. de Carvalho*); R. Chinana (*A. Machado*); Salazar (*P. Hammond*).

Strumigenys bitheria sp. n.

HOLOTYPE WORKER. TL 1·9, HL 0·47, HW 0·37, CI 79, ML 0·20, MI 43, SL 0·28, SI 76, PW 0·22, AL 0·47.

Outer margins of mandibles very feebly convex in full-face view, broadest at about the level of the proximal preapical tooth and weakly tapering towards the base. Apical fork of 2 spiniform teeth, without intercalary teeth or denticles. Each mandible with 2 preapical teeth, the proximal of which is the largest and is situated just distal of the midlength of the blade. The distance separating the bases of the preapical teeth is less than the length of the distal preapical tooth. Anterior two-thirds of upper scrobe margins with a very conspicuous broad bordering translucent lamella or flange which is distinctly broader than the maximum diameter of the eye and approaches the maximum width of the scape. Eyes very small, with only 3–4 ommatidia, the maximum diameter of the eye distinctly less than the maximum width of the scape. Preocular notch absent, the ventral surface of the head without a transverse preocular groove or impression on each side. Antennal scapes narrow, slightly curved at the base and broadest at about the midlength, not distinctly flattened nor with the leading edges convex. Hairs fringing the leading edges of the scapes very slender, much smaller than those fringing the upper scrobe margins. Funicular segments 2 and 3 very reduced, vestigial, their combined length less than half that of the fourth (penultimate) funicular segment. Dorsum of head from posterior margin of clypeus to about the midlength densely clothed with broad conspicuous scale-like hairs. Behind this level mediodorsally are only much smaller sparse hairs but towards the sides of the occipital lobes are hairs similar in construction but smaller than those on the anterior half. Upper scrobe margins fringed with large anteriorly curved spoon-shaped hairs. Dorsum of head with 6 standing hairs arranged in a transverse row of 4 close to the occipital margin and a more anteriorly situated pair. Cephalic dorsum reticulate-punctate. Pronotal humeri each with a single fine flagellate hair. Mesonotum with a single pair of stout standing hairs. Ground-pilosity of dorsal alitrunk of small curved hairs. Posterior portion of mesonotum depressed behind the level of the standing hairs. Propodeal teeth triangular, elongate and narrow, longer than their basal width and subtended by narrow infradental lamellae. Sides of pronotum punctate, remainder of sides of alitrunk mostly smooth, with some punctate patches above and below a large smooth central area. Dorsal alitrunk reticulate-punctate, the pronotum also with some fine longitudinal rugulae. Petiole node as long as broad in dorsal view, the surface punctate. Postpetiole smooth. Spongiform appendages of pedicel segments poorly developed, the petiole with a narrow ventral strip and the node with a lateral lobe which is scarcely broader than the posterior collar. Ventral spongiform lobe of postpetiole about equal in size to the exposed area of the propodeal disc in profile. Basigastral costulae very short but stout, arising across the width of the tergite rather than on each side of a central clear area. Petiole, postpetiole and gaster with stout standing hairs which are swollen or thickened apically, colour light brown.

Holotype worker, **Cameroon**: Nkoemvon, 2.iii.1980 (*D. Jackson*) (BMNH).

Closely related to *nimbrata* and sharing the striking reduction of the second and third funicular segments seen in that species, *bitheria* is distinguished by its broad lamellate upper scrobe margins, longer distal preapical teeth, stronger pronotal sculpture, longer narrower propodeal teeth, and by possessing a petiole node which is as long as broad in dorsal view.

Strumigenys cacaoensis Bolton

(Fig. 49)

Strumigenys cacaoensis Bolton, 1971: 59, fig. 1. Holotype worker, paratype workers and female, **NIGERIA**: Gambari Exp. Sta. (Cocoa Res. Inst. of Nigeria), 10.vii.1969, rot hole in trunk of cocoa tree (*B. Bolton*) (BMNH; MCZ) [examined].

WORKER. TL 2·7–3·3, HL 0·83–0·92, HW 0·72–0·80, CI 86–91, ML 0·38–0·45, MI 44–50, SL 0·48–0·50, SI 62–67, PW 0·36–0·40, AL 0·76–0·88 (11 measured).

Apical fork of left mandible with a dorsally situated small tooth and a ventrally situated denticle between the upper and lower spiniform fork teeth. Apical fork of right mandible with an intercalary denticle only. Preapical armament of both mandibular blades consisting of a pair of teeth or denticles. In general the proximal preapical tooth is very small, reduced to a denticle, and the distal is distinctly larger, but in a few specimens the two are of approximately equal size on each blade. The usual configuration seen in the *rogeri*-group, with the distal preapical tooth distinctly smaller than the proximal, is not found in this species. Upper scrobe margins not bordered by a lamella or flange, narrowly concave and with a pinched-in appearance immediately behind the convex frontal lobes. Posterior to this the upper scrobe margins are evenly divergent then suddenly and deeply excavated above the eye, the site of this excavation directly

above the strongly developed preocular notch so that the two together form a broad deep groove running down the side of the head in front of the eye. Anterior portion of the eye detached from the head and the preocular notch continued onto the ventral surface of the head as a broad transverse impression. Antennal scapes narrow in the basal fifth than broadened, the short curved stout hairs on the leading edge directed apically and broadly spatulate to spoon-shaped. Head reticulate-punctate everywhere, the ground-pilosity of dense short broadly spatulate to scale-like hairs which are curved anteriorly and quite closely applied to the surface, the hairs bordering the upper scrobe margins no longer than those sited elsewhere on the dorsum. Vertex of head without standing hairs of any description. Pronotal humeri without projecting hairs of any description, the mesonotum bearing a single pair of stout hairs which represent the only standing pilosity on the dorsal alitrunk. Ground-pilosity of alitrunk of short sparse spatulate hairs which are closely applied to the surface. Propodeum armed with a pair of acute spines, the infradental lamellae very narrow or vestigial. Sides and dorsum of alitrunk and of pedicel segments reticulate-punctate everywhere, often with a granular appearance on the latter. Metanotal groove shallowly impressed. Spongiform appendages absent from petiole, present on postpetiole as a small ventral lobe and a narrow posterior collar. Transverse basal strip on first gastral tergite reduced to a narrow rim or carina from which the fine basigastral costulae arise. Petiole, postpetiole and gaster with stout hairs which increase in thickness from base to apex. Colour dull yellow to light yellowish brown.

This relatively large species is arboreal, nesting in rot holes in the trunks and branches of trees. It is immediately separated from all its Afrotropical congeners by its unique dentition and strongly excavated upper scrobe margins.

MATERIAL EXAMINED

Ghana: Tafo (*D. Leston*); Tafo (*C. A. Collingwood*); Tafo (*B. Bolton*); Tafo (*A. B. S. King*). **Nigeria:** Gambari (*B. Bolton*).

Strumigenys dextra Brown

Strumigenys dextra Brown, 1954: 27. Holotype and paratype workers, UGANDA: 5 miles (8 km) N. Kamapala, Kawanda Exp. Sta., 15.ii.1949, no. SS 30, soil sample under elephant grass (*G. Salt*) (MCZ) [examined].

WORKER. TL 1.6–1.8, HL 0.41–0.47, HW 0.31–0.34, CI 71–77, ML 0.16–0.19, MI 38–42, SL 0.22–0.25, SI 68–75, PW 0.21–0.24, AL 0.40–0.48 (10 measured).

Mandibles relatively slender, shallowly and evenly curved along the outer margins. Apical fork of each mandible of two teeth, without intercalary teeth or denticles. Preapical armament of left mandible of a single tooth, the right mandible with 2 preapical teeth. Upper scrobe margins concealing the eyes in full-face view. Eyes small, with only 3–5 ommatidia, the maximum diameter of the eye distinctly less than the maximum width of the scape. Preocular notch absent, the ventral surface of the head without a transverse preocular groove or impression on each side. Antennal scape shallowly curved basally, somewhat expanded in the median third, the leading edges with a row of apically curved narrow spoon-shaped hairs. Ground-pilosity of cephalic dorsum reduced, consisting of a few inconspicuous small spatulate hairs. Upper scrobe margins with a triple row of larger narrowly spoon-shaped hairs. Dorsum of head with 6 standing hairs arranged in a transverse row of 4 close to the occipital margin and a more anteriorly situated pair. Pronotal humeri each with a single fine flagellate hair. Mesonotum with a single pair of standing stout hairs which are clavate apically. Ground-pilosity of dorsal alitrunk of inconspicuous narrowly spatulate hairs like those on dorsum of head. In profile the mesonotum feebly or not depressed behind the level of the standing hairs. Propodeal teeth short and subtended by moderately developed infradental lamellae. Sides of pronotum almost smooth to weakly longitudinally rugulose. Pleurae and sides of propodeum smooth except for weak peripheral punctures. Dorsal alitrunk with sparse widely separated longitudinal rugulae on pronotum, the spaces between the rugulae smooth or with vestiges of superficial sculpture. Remainder of dorsal alitrunk reticulate-punctate. Dorsum of petiole node punctate, the postpetiole smooth. Spongiform appendages of pedicel segments only moderately developed. In profile the petiole with a narrow ventral strip and small lateral appendage on the node. Ventral spongiform lobe of postpetiole equal to or slightly smaller than the exposed area of the postpetiolar disc in profile. Basigastral costulae short but sharply defined, arising across the width of the first tergite basally, not radiating on each side of a broad central clear area. Dorsal surfaces of petiole, postpetiole and gaster with stout standing hairs which are narrowly clavate apically. Colour dull yellow.

In the *arnoldi*-complex three other species beside *dextra* have lost the distal preapical tooth of the left mandible, *irrorata*, *katapelta* and *paranax*. The first of these is distinguished from *dextra*

and the rest by also lacking the distal preapical tooth on the right mandible so that both blades have only a single preapical tooth. *S. katapelta* is the only species of the four which possesses intercalary teeth between the spiniform teeth of the apical forks, and *paranax* is easily separated from *dextra* by its possession of a straight stout projecting hair at the humeri where *dextra* has a long fine flagellate hair present.

Elsewhere in the genus *bernardi*, *sarissa* and *londianensis* also have only a single preapical tooth on the left mandible, but in all of these there is a large and very distinct preocular notch present.

MATERIAL EXAMINED

Cameroon: nr Yaounde (*G. Terron*). **Gabon:** Ile aux Singes (*J. A. Barra*). **Angola:** Dundo. **Uganda:** Kampala, Kawanda Exp. Sta. (*G. Salt*); Busnia (*N. A. Weber*). **Central African Republic:** Haut Mbomu (*N. A. Weber*).

Strumigenys dromoshaula sp. n.

HOLOTYPE WORKER. TL 2·1, HL 0·55, HW 0·41, CI 75, ML 0·27, MI 49, SL 0·29, SI 70, PW 0·27, AL 0·54.

Mandibles in full-face view stout and shallowly bowed outwards. Apical fork of each mandible of 2 spiniform teeth, without intercalary teeth or denticles. Blade of each mandible with 2 preapical teeth, the proximal much the largest in each case and the space separating the preapical teeth shorter than the length of the distal tooth; both preapical teeth situated in the apical third of the length of the blade. Upper scrobe margins bordered by a narrow rim or flange throughout their length, evenly divergent posteriorly and more or less straight rather than sinuate. Eyes of moderate size, the maximum diameter about 0·18×HW. In full-face view the eyes plainly visible and their maximum length distinctly greater than the maximum width of the scape. Preocular notch conspicuous and strongly developed, the anterior portion of the eye detached from the side of the head. Preocular notch extended onto ventral surface of head as a broad impression whose width is about equal to or slightly larger than the maximum diameter of the eye and whose margins are rounded and not sharply defined. Antennal scapes very weakly bent in the basal third and somewhat thickened in the median third, the leading edges with an apically curved row of narrow spoon-shaped hairs. Ground-pilosity of cephalic dorsum consisting of inconspicuous spatulate to spoon-shaped minute hairs, the upper scrobe margins fringed with a row of much larger very distinctive spoon-shaped hairs which are curved anteriorly. Dorsum of head posteriorly with 6 standing hairs arranged in a transverse row of 4 close to the occipital margin and a more anteriorly situated pair. In the holotype this anteriorly situated pair, close to the highest point of the vertex, is flattened to the surface, but erect in the paratypes. Dorsum of head finely and densely reticulate-punctate. Pronotal humeri each with a single fine flagellate hair, the mesonotum with a single pair of stout standing hairs. Ground-pilosity of dorsal alitrunk of minute flattened hairs which are closely applied to the surface. Posterior portion of mesonotum slightly depressed behind the level of the pairs of hairs; metanotal groove forming a line across the surface but not impressed. Propodeal teeth broadly triangular and lamellate, sharply elevated and subtended by narrow infradental lamellae. Sides of pronotum showing vestigial striolate sculpture, the pleurae smooth except for some peripheral punctation, which is best developed on the uppermost parts. Sides of propodeum finely punctate. Pronotal dorsum finely longitudinally rugulose with a few punctures visible laterally but the remainder of the dorsal alitrunk reticulate-punctate. Petiole node faintly punctulate dorsally, the sculpture almost effaced; postpetiole smooth. Spongiform appendages of pedicel segments moderately developed. Subpetiolar process consisting of a thickened cuticular longitudinal ridge which is shallowly concave ventrally and from which a narrowly lunate spongiform strip is dependent. Ventral spongiform lobe of postpetiole larger than lateral lobe, about as large as the exposed area of the postpetiolar disc in profile. In dorsal view the postpetiole node with a broad lamellate strip posteriorly which abuts a similar but narrower strip across the base of the first gastral tergite. Petiole node distinctly broader than long in dorsal view. Basigastral costulae arising from the lamellate strip on each side of a central clear area. Petiole, postpetiole and gaster with stout standing hairs which are somewhat thickened apically. Colour brownish yellow, the gaster dark brown.

PARATYPE WORKERS. TL 2·1, HL 0·54–0·55, HW 0·40–0·41, CI 74–75, ML 0·26–0·27, MI 48–49, SL 0·28–0·29, SI 68–73, PW 0·27, AL 0·52 (2 measured).

As holotype but sides of pronotum may be more obviously striolate.

Holotype worker, **Burundi:** Bugarama, 2200 m, 1976–7, under *Eucalyptus* (*A. Dejean*) (MCZ).

Paratypes. 2 workers with same data as holotype (MCZ; BMNH).

Within the 13 species of the *faurei*-complex six have the preocular notch extended onto the

ventral surface of the head as a transverse groove or impression. Of the six *pretoriae* and *petiolata* lack flagellate hairs at the pronotal humeri. *S. faurei* has the postpetiole sculptured. *S. shaula* is separated from *dromoshaula* by the key character concerning the shape of the ventral extension of the preocular notch, and *rufobrunnea* is distinguished by its dental characteristics as the distal preapical tooth is short and widely separated from the proximal.

***Strumigenys dyshaula* sp. n.**

(Fig. 55)

HOLOTYPE WORKER. TL 2.0, HL 0.53, HW 0.40, CI 75, ML 0.25, MI 47, SL 0.28, SI 70, PW 0.26, AL 0.50.

Mandibles in full-face view with the outer margins shallowly convex. Apex of each mandible with a fork of two spiniform teeth, without intercalary teeth or denticles. Preapical armament of 2 teeth on each mandible, situated in the apical third of the length of the blade, the proximal preapical tooth distinctly larger than the distal. Upper scrobe margins evenly divergent posteriorly, shallowly convex and bordered by a thin projecting rim or flange. Eyes visible in full-face view, not wholly hidden by the upper scrobe margins. Preocular notch present but only weakly developed, merely an impression in the side of the head immediately in front of the eyes; the anterior portion of the eye not detached from the side of the head. Preocular notch ending below at the ventrolateral cephalic margin, not extending onto the ventral surface of the head as a transverse groove or impression. Maximum diameter of eye greater than the maximum width of the scape. Antennal scapes very shallowly curved in the basal third, broadest just distal of the midlength, the leading edges with a row of narrow spoon-shaped hairs which are curved apically and are distinctly smaller than those on the upper scrobe margins. Occipital margin of head narrowly and deeply impressed in full-face view. Ground-pilosity of cephalic dorsum consisting of inconspicuous minute spatulate hairs which are closely applied to the surface. Upper scrobe margins with a row of large spoon-shaped hairs which are curved anteriorly and very distinct. Dorsum of head with 6 standing hairs arranged in a transverse row of 4 close to the occipital margin, and a more anteriorly situated pair. Head reticulate-punctate. Pronotal humeri each with a fine flagellate hair. Mesonotum with a single pair of standing hairs. Ground-pilosity of dorsal alitrunk of sparse closely applied hairs similar to those on the head. Posterior portion of mesonotum depressed behind the level of the standing hairs. Metanotal groove forming a line across the dorsum but not impressed in profile. Propodeal teeth triangular and subtended by infradental lamellae. Pleurae mostly smooth, with weak peripheral punctulation which is best developed laterodorsally. Sides of propodeum with a fine punctulate strip above and below the spiracle, otherwise smooth. Sides of pronotum with vestigial striolate and punctulate sculpture. Pronotal dorsum with feeble longitudinal costulae or striae, the remainder of the dorsal alitrunk finely reticulate-punctate. Dorsum of petiole node broader than long and superficially punctate, the postpetiole smooth. Spongiform appendages of pedicel segments moderately developed. In profile the petiole with a shallow ventral process which is about half as deep as the depth of the peduncle at its midlength. Lateral lobe of petiole node bluntly triangular. Ventral and lateral spongiform lobes of postpetiole about equal in size, the former about equal to the exposed portion of the postpetiolar disc in profile. In dorsal view the postpetiole with a lamellar posterior strip which abuts a similar strip traversing the base of the first gastral tergite. Basigastral costulae dense and sharply defined, radiating from each side of a central clear area which is free of costulae. Secondary costulae present which arise between the main costulae, these latter originating on the basal strip and the secondaries arising some distance behind it. Petiole, postpetiole and gaster with stout standing hairs which are broadened to narrowly clavate apically. Colour dull yellow.

PARATYPE WORKERS. TL 2.0–2.1, HL 0.54–0.56, HW 0.40–0.43, CI 74–78, ML 0.25–0.27, MI 46–48, SL 0.28–0.31, SI 70–74, PW 0.26–0.28, AL 0.50–0.54 (7 measured). As holotype.

Holotype worker, **Zimbabwe**: Victoria Falls, spray forest, rotten wood M440, 7.iii.1969 (W. L. Brown) (MCZ).

Paratypes. 8 workers and 1 female with some data as holotype (MCZ; BMNH; MHN).

Of the species possessing a preocular notch and relatively large eyes a number of forms do not have the preocular notch extended onto the ventral surface of the head as a transverse impression. Among the six species in this category *dyshaula* is distinguished by having a postpetiole whose sides are not completely lapped around by spongiform tissue, having the ventral lobe of the postpetiole well developed, having six standing hairs on the cephalic dorsum and having basigastral costulae which do not arise as a regular row across the width of the tergite but rather radiate out from each side of a central clear area.

Strumigenys ettillax sp. n.

HOLOTYPE WORKER. TL 2.0, HL 0.57, HW 0.46, CI 81, ML 0.23, MI 40, SL 0.27, SI 59, PW 0.30, AL 0.52.

Mandibles stout, the outer margins shallowly convex in full-face view and sharply incurved basally where the blades suddenly narrow to their insertions. Apical fork of each mandible with 2 spiniform teeth, without intercalary teeth or denticles. Each mandibular blade with 2 stout preapical teeth, the proximal about one-third longer than the distal and their bases separated by a distance which is slightly less than the length of the distal preapical tooth. Upper scrobe margins very feebly sinuate in full-face view, bordered by a narrow rim or flange and meeting the sides of the occipital lobes (at the scrobal apices) in an obtuse but distinct angle, the upper scrobe margins not merging smoothly into the sides of the occipital lobes. Eyes of moderate size, with 5 ommatidia across the greatest diameter and with 15 or more ommatidia in all. Maximum diameter of eye greater than the maximum width of the scape. Preocular notch absent, ventral surface of head without a transverse preocular groove or impression. Antennal scapes narrow and shallowly curved basally, expanded in the median third and with the leading edges equipped with a row of apically curved spoon-shaped hairs which are distinctly smaller than those fringing the upper scrobe margins. Ground-pilosity of cephalic dorsum of inconspicuous small flattened hairs, the upper scrobe margins with a row of large spoon-shaped hairs. Dorsum of head with 6 standing hairs, arranged in a transverse row of 4 close to the occipital margin and a more anteriorly situated pair. Dorsum of head densely reticulate-punctate. Pronotal humeri each with a fine flagellate hair. Mesonotum with a single pair of stout standing hairs which are thickened apically. Ground-pilosity of dorsal alitrunk of inconspicuous small hairs like those on the head. Posterior portion of mesonotum very slightly depressed behind the level of the pair of hairs, the metanotal groove forming a weak line across the dorsum. Propodeal teeth short and triangular, subtended by relatively broad infradental lamellae which at their broadest extend posteriorly almost as far as the apices of the teeth. Sides of pronotum feebly punctate-striolate, the pleurae and sides of propodeum mostly smooth but with some peripheral punctate sculpture. Pronotum finely and quite densely longitudinally rugulose, the remainder of the dorsal alitrunk reticulate-punctate. Dorsum of petiole node finely punctate, the postpetiole smooth. Ventral spongiform strip of petiolar peduncle narrow, broadening beneath the node. Lateral spongiform lobe of postpetiole equal to or slightly exceeding the exposed area of the disc in profile. In dorsal view the lateral spongiform material is visible, projecting beyond the outline of the sides of the postpetiole. Basigastral costulae sparse, 5-6 arising on each side of a narrow clear central area. Petiole, postpetiole and gaster dorsally with stout standing hairs which are thickened apically. Colour blackish brown.

PARATYPE WORKERS. TL 2.0, HL 0.53-0.54, HW 0.43-0.44, CI 81, ML 0.23, MI 42-43, SL 0.26, SI 59-60, PW 0.27, AL 0.50-0.52 (2 measured).

As holotype but one lighter in colour than the holotype and probably teneral.

Holotype worker, **Cameroun**: nr Yaounde, series IY (*G. Terron*) (ENSA).

Paratypes. 2 workers with same data as holotype but one series AM, the other series TR (ENSA; BMNH).

Strumigenys faurei Arnold sp. rev.

Strumigenys faurei Arnold, 1948: 226, figs 12, 12a. Syntype workers and females, SOUTH AFRICA: Natal, Zululand, Sordwana, 21.v.1946 (*J. C. Faure*) (SAM) [examined]. [Previously synonymized with *rufobrunea* by Brown, 1954: 17.]

WORKER. TL 2.2-2.3, HL 0.55-0.56, HW 0.43-0.44, CI 77-79, ML 0.25-0.26, MI 46-47, SL 0.30-0.32, SI 70-72, PW 0.25-0.27, AL 0.55-0.57 (6 measured).

Outer margins of mandibles shallowly convex, the blades weakly bowed outwards in full-face view. Apical fork of each mandible with 2 spiniform teeth, without intercalary teeth or denticles. Preapical armament of 2 teeth on each blade, the proximal spiniform and much larger than the distal. Length of left distal preapical tooth about equal to the distance separating the bases of the preapical teeth. Upper scrobe margins bordered by a narrow rim or flange, not concealing the eyes in full-face view. Maximum diameter of eye slightly greater than the maximum width of the scape. Preocular notch strongly developed, the anterior portion of the eye detached from the side of the head. Preocular notch continued onto ventral surface of head as a broad shallow impression whose margins are quite sharply defined close to the eye but are more rounded and indistinct elsewhere; the maximum width of the impression the same as or slightly more than the maximum diameter of the eye. Antennal scapes very feebly bent in the basal third, broadest at about the midlength and the leading edges equipped with a row of apically curved spatulate to narrowly spoon-shaped hairs which are distinctly smaller and finer than those on the upper scrobe margins. Ground-pilosity of head of minute spatulate hairs which are curved, inconspicuous and closely applied to

the surface. Upper scrobe margins with a row of projecting large anteriorly curved narrowly spoon-shaped hairs. Dorsum of head with 6 standing hairs arranged in a transverse row of 4 close to the occipital margin and a more anteriorly situated pair. Dorsum of head reticulate-punctate. Pronotal humeri each with a single fine flagellate hair. Mesonotum with a pair of stout standing hairs. Ground-pilosity of alitrunk similar to that on the head but the hairs sparse. Posterior half of mesonotum depressed behind the level of the pair of hairs and with a shallow transverse impression at the base of the slope, behind which the remainder of the mesonotum rises slightly to the level of the propodeum. Metanotal groove forming a transverse line on the dorsum, extremely weakly impressed. Propodeal teeth triangular and subtended by an infradental lamella. Sides of pronotum feebly punctate. Pleurae smooth except for sparse peripheral punctures and a patch on the upper half of the mesopleuron which is punctate. Pronotal dorsum finely longitudinally rugulose with weak punctures between the rugulae posteriorly. Remainder of dorsal alitrunk reticulate-punctate. Petiole node in dorsal view finely punctate, twice broader than long. Postpetiole with the disc finely and densely longitudinally costulate except for the posteromedian area which is smooth. Subpetiolar process reduced to a very thin laminar strip. Ventral spongiform lobe of postpetiole slightly larger than the lateral lobe but smaller than the exposed area of the postpetiolar disc in profile. In dorsal view the postpetiole with a thin transverse laminar strip posteriorly which abuts a similar but even narrower strip across the base of the first gastral tergite from which the fine but sharply defined basigastral costulae arise. Petiole, postpetiole and gaster with standing hairs which are broadened apically. Colour dull yellow.

Close to the West African *rufobrunnea* but slightly larger and evenly yellow in colour, *faurei* also differs by having the postpetiole densely costulate, the subpetiolar process very reduced, the petiole node twice broader than long dorsally, and the ventral preocular impression broader and less sharply defined.

Included by Brown (1954) as a synonym of *rufobrunnea*, I consider *faurei* to be sufficiently distinct to be regarded as a separate species on the strength of the characters noted above.

MATERIAL EXAMINED

South Africa: Natal, Sordwana (*J. C. Faure*); St Lucia Lake (*J. C. Faure*); Richards Bay (*J. C. Faure*); Dukuduku Forest Res. (*W. L. & D. E. Brown*).

Strumigenys hastyla sp. n.

HOLOTYPE WORKER. TL 2.0, HL 0.52, HW 0.38, CI 73, ML 0.23, MI 44, SL 0.29, SI 76, PW 0.24, AL 0.52.

Mandibles slender in full-face view, the outer margins evenly and very shallowly curved, the blades only slightly tapering from their broadest point near the base to the apex. Apical fork of each mandible with 2 spiniform teeth, without intercalary teeth or denticles. Each mandible with 2 preapical teeth which are stout and situated within the apical quarter of the length of the blade, the proximal tooth slightly longer and thicker than the distal. The preapical teeth on each blade close together so that the length of the distal tooth is more than twice the distance which separates their bases. Upper scrobe margins shallowly divergent and evenly curved, confluent with the sides of the occipital lobes through an even smooth curve in full-face view. Eyes quite large, with about 15 ommatidia, the maximum diameter of the eye distinctly greater than the maximum width of the scape. Preocular notch absent, the ventral surface of the head without a preocular transverse groove or impression on each side. Antennal scapes slender and almost cylindrical, very shallowly curved in the basal third, their leading edges with a row of apically curved slender hairs which are somewhat flattened to very feebly and narrowly spoon-shaped, smaller than the hairs fringing the upper scrobe margins. Cephalic ground-pilosity of numerous narrowly spatulate to slender spoon-shaped hairs, the upper scrobe margins fringed with a row of similar or very slightly larger hairs. Dorsum of head with 6 standing hairs, arranged in a transverse row of 4 close to the occipital margin and a more anteriorly situated pair. Dorsum of head reticulate-punctate. Pronotal humeri each with a single fine flagellate hair. Mesonotum with a single pair of standing hairs. Ground-pilosity of dorsal alitrunk like that of head but the hairs smaller and more widely scattered. Mesonotum shallowly depressed behind the level of the pair of hairs. Propodeal teeth triangular and subtended by conspicuous infradental lamellae. Sides of pronotum weakly rugulose. Pleurae and sides of propodeum mostly smooth but with punctate areas around the periphery. Pronotum dorsally finely longitudinally rugulose, the spaces between the rugulae superficially punctate. Remainder of dorsal alitrunk reticulate-punctate. Dorsum of petiole node reticulate-punctate, the propodeum smooth. Spongiform appendages of pedicel segments well developed, the petiole with a broad ventral strip and a distinct lateral lobe on the node, the postpetiole with large ventral and lateral spongiform lobes. In dorsal view the disc of the postpetiole appears surrounded by spongiform tissue on all sides as the lateral and ventral lobes project beyond the outline of the disc. Basigastral costulae arise on the first tergite on each side of a central clear area. Dorsal surfaces of petiole, postpetiole and gaster with

standing hairs, some or all of which are thickened or flattened apically in dorsal view. Colour brownish yellow.

PARATYPE WORKERS. TL 1.8–2.0, HL 0.49–0.52, HW 0.36–0.38, CI 73–75, ML 0.22–0.23, MI 43–45, SL 0.28–0.29, SI 76–78, PW 0.22–0.24, AL 0.48–0.52 (3 measured). As holotype.

Holotype worker, **Burundi**: Bujumbura, 1977, no. 17 (*A. Dejean*) (BMNH).

Paratypes. 3 workers with same data as holotype (BMNH; MCZ).

Non-paratypic material examined. **Ivory Coast**: Mongaga (*V. Mahnert & J.-L. Perret*); Dropleu (*V. Mahnert & J.-L. Perret*); Man (*V. Mahnert & J.-L. Perret*); Banco Forest (*I. Löbl*); Anguédédou (*W. L. Brown*); Nzi Noua (*W. L. & D. E. Brown*). **Nigeria**: Gambari (*B. Bolton*). **Cameroun**: Victoria (*B. Malkin*); nr Yaounde (*G. Terron*). **Gabon**: Plateau d'Ipassa (*J. A. Barra*). **Angola**: Gubela (*P. Hammond*); Dundo (*L. de Carvalho*). **Burundi**: Imbo Plain (*A. Dejean*).

Variation in this non-paratypic material is as follows. TL 2.0–2.1, HL 0.48–0.54, HW 0.34–0.39, CI 70–74, ML 0.21–0.24, MI 42–46, SL 0.27–0.31, SI 76–82, PW 0.22–0.25, AL 0.48–0.56 (18 measured). The pronotum in some is wholly reticulate-punctate dorsally, the fine longitudinal rugulae seen in the type-series being suppressed. Much of the West African material is darker in colour, medium brown, so that the cephalic ground-pilosity is more conspicuous.

S. hastyla is one of three very closely related species in the *scotti*-complex. Along with *scotti* and *zandala*, *hastyla* is characterized by the form of the mandibles, the elongate almost cylindrical scapes, the relatively slender fringing hairs on the upper scrobe margins (which are only slightly or not at all larger than the cephalic ground-pilosity), the large eyes, lack of a preocular notch and ventral preocular groove or impression, and evenly rounded sides of the head which round into the upper scrobe margins without trace of an angle. These three species are very similar and difficult to separate. *S. scotti* is the largest of the three and has relatively long mandibles and scapes; it also tends to have the petiole node longer than broad in dorsal view whereas in the other two the node is very obviously broader than long. The measurements compare as follows.

	HL	HW	MI	SI
<i>scotti</i>	0.62–0.70	0.42–0.46	46–50	88–95
<i>zandala</i>	0.59–0.61	0.42–0.44	43–45	75–81
<i>hastyla</i>	0.48–0.54	0.34–0.39	42–46	76–82

As can be seen, *hastyla* is the smallest species of the three in absolute terms. It also differs from *zandala* as the gastral hairs are simple in the latter but mostly flattened or thickened apically in *hastyla*.

Strumigenys havilandi Forel

(Figs 65, 70)

Strumigenys havilandi Forel, 1905: 13. Syntype workers, SOUTH AFRICA: Natal, 5300 ft (1615 m) (*Haviland*) (MHN; BMNH) [examined].

Strumigenys havilandi Forel; Brown, 1954: 25.

WORKER. TL 2.5–2.6, HL 0.62–0.68, HW 0.44–0.50, CI 69–74, ML 0.28–0.33, MI 45–50, SL 0.36–0.40, SI 80–90, PW 0.28–0.32, AL 0.62–0.68 (13 measured).

Mandibles in full-face view slender and almost straight, broadest basally and evenly tapering towards the apex. Apical fork of each mandible with 2 spiniform teeth, without intercalary teeth or denticles. Each mandibular blade with 2 spiniform preapical teeth, the distal only slightly shorter than the proximal and the distance separating their bases distinctly less than the length of the distal preapical tooth. Eyes small, with only 4–5 ommatidia, their maximum diameter much less than the maximum width of the scape. Preocular notch absent, the ventral surface of the head without a transverse preocular groove or impression. Antennal scapes elongate and relatively narrow, SI 80–90, matched only by *korahyla* in the *arnoldi*-complex. The scapes only shallowly and very gently curved, slightly expanded beyond the curve and with their leading edges having an apically directed row of narrow spoon-shaped hairs which are about the same size as those fringing the upper scrobe margins. Ground-pilosity of cephalic dorsum of numerous but inconspicuous narrowly spoon-shaped hairs, the upper scrobe margins fringed by a row of hairs which are the same as those on the dorsum of the head. Occipital margin dorsally with a transverse row of 4 short

curved standing hairs and a pair of similar but even shorter hairs situated anterior to this row. Dorsum of head reticulate-punctate. Pronotal humeri each with a single fine flagellate hair. In this species the hair appears to be very delicate and easily lost by abrasion. Mesonotum with a single pair of standing hairs. Ground-pilosity of dorsal alitrunk of numerous small curved spatulate to spoon-shaped hairs similar to those on the head but slightly smaller. Metanotal groove a transverse line across the dorsum, weakly impressed in profile. Propodeal teeth slender and triangular, subtended by a broad infradental lamella on each side. Sides of alitrunk smooth, with only peripheral punctuation present. Pronotal dorsum finely superficially longitudinally rugulose, the rugulae low and inconspicuous, frequently with faint punctures between them. Remainder of dorsal alitrunk finely reticulate-punctate. Petiole node reticulate-punctate dorsally, the postpetiole smooth. Postpetiole distinctly swollen and inflated, subglobular. Spongiform appendages of petiole consisting of a fairly broad ventral strip and a narrow posterior collar. Postpetiole in profile with the lateral lobe much reduced, obviously smaller than the ventral spongiform lobe, and the latter itself relatively small, smaller than the exposed area of the postpetiolar disc in profile. Basigastral costulae short but distinct. Dorsal surfaces of petiole, postpetiole and gaster with standing short hairs which are expanded apically. Colour yellow.

In the *arnoldi*-complex *havilandi* is characterized by its long scapes, the structure of its mandibles and the form of its inflated postpetiole and spongiform appendages. It resembles the two closely related species *traegaordhi* and *mesahyla* but, apart from the mandibular character quoted in the key, may be separated from both by its long scapes and form of the postpetiole and its appendages; compare Figs 69, 70.

MATERIAL EXAMINED

South Africa: Natal (*Haviland*); Natal, Gillitts (*W. L. & D. E. Brown*).

Strumigenys helytruga sp. n.

HOLOTYPE WORKER. TL 2.2, HL 0.59, HW 0.43, CI 73, ML 0.29, MI 49, SL 0.34, SI 79, PW 0.26, AL 0.55.

In full-face view the mandibular blades approximately straight. Apical fork of each mandible with 2 spiniform teeth, without intercalary teeth or denticles. Preapical armament of 2 teeth on each blade, the proximal only fractionally longer than the distal and with both teeth situated in the apical third of the length of the blade. Upper scrobe margins evenly divergent posteriorly and without a bordering rim or flange, posteriorly grading evenly into the sides of the head. Preocular notch vestigially present, represented only by a feeble indentation of the ventrolateral margin immediately in front of the eye, the notch not extended onto the ventral surface of the head as a transverse groove or impression. Eye relatively small, about $0.12 \times HW$ and with 8 ommatidia, the maximum diameter of the eye about equal to the maximum width of the scape or fractionally larger. Antennal scapes slender and roughly cylindrical, shallowly curved basally and with their leading edges equipped with a row of apically curved narrow spatulate hairs. Ground-pilosity of head consisting of quite dense conspicuous spatulate hairs which are broader than those on the leading edges of the scapes. Upper scrobe margins without larger hairs but fringed with spatulate hairs the same size and shape as those on the dorsum. Elongate standing hairs on cephalic dorsum restricted to a single pair situated close to the midline near the occipital margin. Dorsum of head reticulate-punctate. Pronotal humeri each with a single fine flagellate hair. Mesonotum with a single pair of standing stout hairs. Ground-pilosity of dorsal alitrunk of sparse narrowly spatulate hairs. Posterior portion of mesonotum shallowly depressed behind the level of the hairs. Metanotal groove represented by a feebly impressed line. Propodeal teeth triangular and subtended by conspicuous infradental lamellae. Sides of alitrunk mostly smooth but with some punctate sculpture dorsally and posteriorly. Pronotal dorsum longitudinally sparsely rugulose, with feeble superficial punctures between the rugulae. Mesonotum and propodeum densely punctate. Dorsum of petiole node punctate, the postpetiole smooth. In profile the petiole with a well-developed spongiform ventral strip and a narrow lateral lobe. Postpetiole with large ventral and lateral lobes. In dorsal view the petiole node with a broad posterior spongiform strip, the postpetiole with spongiform material projecting beyond the sides and posteriorly with a laminar transverse strip connecting the spongiform lateral lobes. Transverse basal strip of first gastral tergite laminar, the basigastral costulae arising from it sharply defined but sparse and short, with only 4 or 5 on each side of a central clear area. Petiole, postpetiole and gaster dorsally with stout standing hairs which are thickened apically. Colour dull brownish yellow.

Holotype worker, **Angola:** Bruco, 26.ii.-2.iii.1972, forest litter (*P. Hammond*) (BMNH).

A member of the *scotti*-complex, *helytruga* is separated from its four close relatives (*scotti*, *hastyla*, *murshila* and *zandala*) by its retention of a vestigial preocular notch and relatively very

small eyes. Of the five species only *murshila* has eyes which approach the small size seen in *helytruga*, but here the preocular notch is absent, the mandibles are conspicuously bowed outwards, the cephalic dorsum has six standing hairs, the postpetiole is sculptured and the distal preapical tooth of the left mandible is less than half the length of the proximal.

Strumigenys irrorata Santschi

Strumigenys irrorata Santschi, 1913a: 257 (diagnosis in key). Holotype worker, SOUTH AFRICA: Natal, Zululand, Lake Sibayi (*I. Trägårdh*) (NMB) [examined].

Strumigenys irrorata Santschi; Santschi, 1914c: 29, fig. 5 (description).

Strumigenys irrorata Santschi; Brown, 1954: 33.

WORKER. TL 1.9–2.1, HL 0.47–0.54, HW 0.38–0.43, CI 76–83, ML 0.19–0.23, MI 40–43, SL 0.24–0.28, SI 62–70, PW 0.24–0.27, AL 0.50–0.56 (10 measured).

Apical fork of each mandibular blade with 2 spiniform teeth, without intercalary teeth or denticles. Preapical armament of a single spiniform tooth on each blade which corresponds to the proximal preapical tooth in related species; the distal preapical teeth lost. Upper scrobe margins strongly divergent behind the frontal lobes, the eyes not visible in full-face view. Eyes very small, conspicuously much smaller than the maximum width of the scape. Preocular notch absent, the ventral surface of the head without a preocular transverse groove or impression. Scapes short, weakly curved, their anterior margins shallowly convex and equipped with a row of short spoon-shaped to scale-like hairs. Ground-pilosity of cephalic dorsum of dense short spoon-shaped hairs which are broad and appear scale-like in full-face view. Hairs fringing the upper scrobe margins the same as those on the dorsum, and about equal in size to the projecting hairs on the leading edges of the scapes. Dorsum of head with 6 standing hairs, arranged in a transverse row of 4 close to the occipital margin and a more anteriorly situated pair. Dorsum of head densely reticulate-punctate. Pronotal humeri each with a single long fine flagellate hair. Mesonotum with a single pair of stout standing hairs which are weakly clavate apically. Ground-pilosity of dorsal alitrunk of sparse small hairs which are spatulate to narrowly spoon-shaped. Propodeal teeth subtended by broad infradental lamellae. Metanotal groove not impressed. Sides of alitrunk mostly smooth, sometimes with vague traces of sculpture on the pronotal sides and usually with weak punctulae on the pleurae and propodeum. Pronotal dorsum longitudinally rugulose, the rest of the dorsal alitrunk punctate. Dorsum of petiole node punctate, the postpetiole smooth and shining. Spongiform appendages of pedicel segments well developed, the petiole with a broad ventral spongiform strip and the postpetiole with large ventral and lateral lobes. Basigastral costulae short but sharply defined. Dorsal surfaces of petiole, postpetiole and gaster with stout standing hairs which are weakly clavate apically. Colour medium to dark brown.

Immediately recognized by its unique (in Africa) preapical dentition, *irrorata* is the only member of the *rogeri*-group having a single preapical tooth on each mandibular blade. The usual count in the group is 2 preapical teeth on each blade but a few species have one left and two right preapical teeth.

MATERIAL EXAMINED

Zimbabwe: Umtali, Melsetter (*R. Mussard*). **South Africa:** Natal, Lake Sibayi (*I. Trägårdh*); Gillitts, nr Durban (*W. L. & D. E. Brown*); Town Bush, nr Pietermaritzburg (*W. L. & D. E. Brown*).

Strumigenys katapelta sp. n.

(Figs 61, 76)

HOLOTYPE WORKER. TL 2.1, HL 0.51, HW 0.46, CI 90, ML 0.20, MI 39, SL 0.27, SI 59, PW 0.27, AL 0.56.

Mandibles short and conspicuously bowed outwards in full-face view. Apical fork of each mandible consisting of a long spiniform tooth dorsally, a smaller spiniform tooth ventrally and an intercalary denticle between the two longer teeth. Blade of left mandible with a single long spiniform preapical tooth, the proximal; right mandible with a similar proximal preapical tooth and with a very small distal preapical tooth also present. Head broad, the upper scrobe margins strongly divergent and the eyes not visible in full-face view. Eyes small, with only 3–4 ommatidia, their maximum diameter distinctly much less than the maximum width of the scape. Preocular notch absent, the ventral surface of the head without a preocular transverse groove or impression. Antennal scapes short and curved, their anterior margins flattened and expanded in the median third, broadest at the midlength; their convex leading edges with a row of shallowly spoon-shaped to flattened large broad hairs. Cephalic ground-pilosity of inconspicuous short stubby flattened hairs which are closely applied to the surface; without the scale-like or broadly

spoon-shaped hairs usually seen in the *arnoldi*-complex. Upper scrobe margins fringed by similar small hairs, these hairs distinctly very much smaller than those on the leading edges of the scapes. Dorsum of head with a row of 4 standing hairs close to the occipital margin, without a further pair of hairs situated close to the highest point of the vertex. Dorsum of head reticulate-punctate. Pronotal humeri without flagellate hairs, instead each with a projecting straight stout hair which is thickened and flattened apically, directed laterally and slightly elevated. Mesonotum with a single pair of stout standing hairs. Ground-pilosity of dorsal alitrunk of small hairs similar to those on the head. Metanotal groove represented by a line across the dorsum. Propodeal teeth short and triangular, subtended by infradental lamellae whose free margins are concave. Sides of alitrunk smooth except for weak punctures around the periphery. In dorsal view the pronotum sharply marginate anteriorly, weakly longitudinally rugulose and with feeble punctures between the rugulae. Mesonotum reticulate-punctate. Propodeal dorsum smooth anteriorly but punctate posteriorly and between the teeth. Dorsum of petiole node almost smooth, with only the faintest vestiges of reticular patterning; postpetiole smooth. Spongiform appendages of pedicel segments well developed. The petiole in profile with a ventral strip and triangular lateral lobe. Postpetiole with large ventral and lateral spongiform lobes, the former larger than the exposed area of the postpetiolar disc in profile. In dorsal view the disc of the postpetiole surrounded on all sides by projecting spongiform tissue. Basigastral costulae short but sharply defined. Petiole, postpetiole and gaster dorsally with stout standing hairs. Colour brownish yellow.

PARATYPE WORKERS. TL 2.0–2.2, HL 0.50–0.53, HW 0.44–0.46, CI 88–90, ML 0.20–0.21, MI 38–40, SL 0.26–0.27, SI 57–60, PW 0.25–0.28, AL 0.54–0.56 (4 measured). As holotype.

Holotype worker, **Burundi**: Bujumbura, 1977, no. 42 (*A. Dejean*) (BMNH).

Paratypes. 4 workers with same data as holotype (BMNH; MCZ).

Non-paratypic material examined. **Kenya**: Embu, Kirimiri Forest W. of Runyenje (*V. Mahnert & J.-L. Perret*); Mau Forest (*V. Mahnert & J.-L. Perret*).

The non-paratypic material from Kenya answers to the description of the holotype but shows the following size range. HL 0.52–0.55, HW 0.43–0.48, CI 85–87, ML 0.20–0.23, MI 38–41, SL 0.26–0.30, SI 58–63 (5 measured).

The *arnoldi*-complex has only four species in which the distal preapical tooth of the left mandible has been lost, *katapelta*, *irrorata*, *dextra* and *paranax*. *S. katapelta* is easily separated from the other three as it is the only species to have an intercalary denticle between the apical fork teeth. Apart from this it separates from *irrorata* as that species has also lost the distal preapical tooth of the right mandible; from *dextra* as that species has flagellate hairs at the pronotal humeri; and from *paranax* as that species is much smaller, with a narrower head and longer antennal scapes.

Strumigenys korahyla sp. n.

(Fig. 64)

HOLOTYPE WORKER. TL 2.3, HL 0.62, HW 0.44, CI 71, ML 0.30, MI 48, SL 0.36, SI 82, PW 0.29, AL 0.60.

Mandibles slender and moderately long, the blades broadening slightly from base to apex in full-face view, not bowed outwards. Apical fork of each mandible of 2 spiniform teeth, without intercalary teeth or denticles. Preapical armament of 2 teeth on each mandible, the proximal tooth about one-third longer than the distal and the distance separating their bases equal to or slightly greater than the length of the distal preapical tooth. Upper scrobe margins bordered by a broad translucent rim or flange, the eyes not visible in full-face view. Eyes very small, with only 4–5 ommatidia, their maximum diameter distinctly less than the maximum width of the scape. Preocular notch absent, the ventral surface of the head without a preocular groove or impression on each side. Antennal scapes long and slender, approximately straight, very narrow in the basal eighth then with the anterior margin suddenly broadened. Beyond this the scape evenly tapering towards the apex. Leading edges of scapes with a series of small apically curved spoon-shaped hairs which are very obviously much smaller than those on the upper scrobe margins. Dorsum of head from the posterior clypeal margin to the midlength with large anteriorly curved shallowly spoon-shaped hairs which appear scale-like in full-face view. Similar but even larger hairs are present fringing the upper scrobe margins. Behind the midlength of the head the hairs of the cephalic ground-pilosity are much smaller and contrast with the larger anterior hairs. Dorsum of head with a transverse row of 4 clavate standing hairs close to the occipital margin, and with a pair of similar but smaller hairs close to the highest point of the vertex (this abraded in the holotype but present in the paratypes). Dorsum of head densely punctate, the

walls of the punctures aligned in places on the occipital lobes and showing as fine rugulae. Pronotal humeri hairless. Mesonotum with a single pair of clavate hairs. Metanotal groove represented by a faint line across the dorsum, extremely weakly impressed in profile. Mesonotum slightly depressed behind the level of the hairs, the base of the declivous portion forming a shallow transverse impression. Propodeal teeth triangular and acute, subtended by narrow infradental lamellae. Sides of pronotum sculptured, remainder of sides of alitrunk smooth except for weak peripheral punctures. Pronotal dorsum longitudinally rugulose, the remainder of the dorsal alitrunk reticulate-punctate. Dorsum of petiole node reticulate-punctate, the postpetiole smooth. Spongiform appendages of pedicel segments moderately developed. In profile the petiole with a straight ventral strip and small lateral appendages. Postpetiole with a small lateral spongiform lobe and a slightly larger ventral lobe, the latter, however, slightly smaller than the exposed area of the postpetiolar disc in profile. In dorsal view the postpetiolar disc about 1.5× broader than the petiole node. Basigastral costulae short and widely spaced, but sharply defined. Dorsal surfaces of petiole, postpetiole and gaster with stout clavate hairs. Colour brownish yellow.

PARATYPE WORKERS. TL 2.2–2.3, HL 0.61–0.64, HW 0.41–0.43, CI 67, ML 0.30–0.32, MI 49–50, SL 0.35–0.36, SI 84–85, PW 0.27–0.28, AL 0.58–0.60 (2 measured). As holotype.

Holotype worker, **Cameroun**: nr Yaounde, series MT (*G. Terron*) (ENSA).

Paratypes. 2 workers with same data as holotype but one series OV, the other series EP (ENSA; BMNH).

Among the species of the *arnoldi*-complex, characterized by their small to minute eyes, lack of a preocular notch and ventral preocular impression, and scale-like cephalic ground-pilosity, only two species have elongate mandibles and scapes. These two, *korahyla* and *havilandi*, compare with the remaining 11 species of the complex as follows.

	MI	SI
<i>havilandi</i>	45–50	80–90
<i>korahyla</i>	48–50	82–85
remainder of <i>arnoldi</i> -complex	26–45	52–75

Apart from this *korahyla* is characterized within the *arnoldi*-complex by its complete preapical dentition of 2 teeth on each mandible, lack of intercalary or adventitious teeth in the mandibular apical fork, lack of pronotal flagellate hairs at the humeri, slender antennal scapes and hairs on the leading edges of the scapes which are much smaller than those on the upper scrobe margins.

Strumigenys londianensis (Patrizi)

Proscopomyrmex londianensis Patrizi, 1946: 295, figs 1, 2. Syntype workers, KENYA: Londiani, q. 2260 m.s.m., 4.ix.1943 (*S. Patrizi*); and Mau Forest, 16.i.1946 (*Meneghetti*) (BMNH; MCZ) [examined].

Strumigenys (*Proscopomyrmex*) *londianensis* (Patrizi) Arnold, 1948: 227.

Strumigenys londianensis (Patrizi); Brown, 1954: 14.

WORKER. TL 3.5–4.2, HL 0.84–0.92, HW 0.62–0.70, CI 74–77, ML 0.44–0.47, MI 51–52, SL 0.52–0.58, SI 82–87, PW 0.38–0.44, AL 0.82–0.94 (8 measured).

Apical fork of left mandible with a small intercalary tooth between the upper and lower fork teeth; right apical fork without an intercalary tooth. Blade of left mandible with a single spiniform preapical tooth present (the proximal); blade of right mandible with 2 preapical teeth, a larger proximal and a smaller distal tooth which is situated close to the apical fork and may be hidden by the opposing left apical fork when the mandibles are fully closed. Upper scrobe margins not bordered by a continuous projecting lamina, close together on anterior third of head, the eyes clearly visible in full-face view. Upper scrobe margins concave immediately behind the convex frontal lobes, with a pinched-in appearance. Behind this the scrobe margins shallowly concave above the eyes and then diverging posteriorly. Preocular notch deep and strongly developed, the anterior portion of the eyes detached from the side of the head. Preocular notch continued onto the ventral surface of the head as a conspicuous broad transverse impression. Antennal scapes roughly cylindrical, very slightly broadened in the median third and with a characteristic arrangement of strong hairs projecting from the leading edge. The basalmost 1–3 (usually 2) projecting hairs are curved apically, the next 3–4 are curved basally and the distalmost 3–4 are curved apically. Ground-pilosity of head short, broadly spatulate to scale-like everywhere and curved anteriorly. In profile the vertex usually with a single pair of stout standing hairs which are weakly clavate, but these are easily lost by abrasion. Dorsum of head reticulate-punctate. Pronotal humeri each with a long stout straight hair which is

remiform to weakly clavate apically. Mesonotum with a single pair of shorter stout straight hairs which are somewhat more strongly clavate apically; the dorsal alitrunk otherwise without standing pilosity but with sparse narrowly spatulate appressed ground-pilosity. In profile the posterior portion of the mesonotum sharply depressed below the level of the anterior portion and pronotum, forming a single surface with the propodeum. Metanotal groove absent. Propodeum without differentiated angular teeth, instead the infradental lamellae merely bulge slightly and form blunt angles dorsally. Sides of alitrunk mostly punctate but with some smooth shining areas on the pleurae. Dorsal alitrunk predominantly punctate but the pronotum generally with a few posteriorly divergent rugulae superimposed on the punctures. Petiole node weakly punctulate dorsally, the postpetiole generally smooth but sometimes with the weakest vestiges of punctulate sculpture visible. Spongiform appendages of petiole represented by a thin ventral strip and a narrow posterior collar on the node. Postpetiole in profile with moderately well-developed ventral and lateral spongiform lobes and in dorsal view with a very narrow anterior and posterior spongiform strip. Basigastral costulae short and sparse, radiating from the narrow basal spongiform strip of the first tergite. Petiole, postpetiole and gaster dorsally with stout strong hairs which are clavate apically. Colour light brown, gaster darker.

A relatively large and easily recognized species, *londianensis* is known only from Kenya. Together with its close relative *sarissa*, *londianensis* is characterized by its distinctive mandibular dentition, deep preocular notch and detached dye. The only species coming close to *londianensis* and *sarissa* is *bernardi*, but this is a smaller species with relatively long mandibles which lacks intercalary teeth in the apical fork. The other two are separated as follows.

londianensis
 HW 0.62–0.70, HL 0.84–0.92.
 Some hairs on leading edge of antennal scape curved basally.
 Vertex of head in profile with a single pair of stout clavate standing hairs, the cephalic ground-pilosity short and broadly spatulate.
 Pronotal humeri with stout straight hairs which are clavate apically.
 Anterior pronotal margin between the humeral hairs without other standing hairs.
 Propodeum without triangular teeth.

sarissa
 HW 0.50–0.60, HL 0.72–0.82.
 All hairs on leading edge of antennal scape curved apically.
 Vertex of head in profile without standing hairs, the cephalic ground-pilosity elongate, dense and narrowly spatulate.
 Pronotal humeri with elongate fine flagellate hairs.
 Anterior pronotal margin between the humeral hairs with a pair of stouter standing hairs; rarely with two pairs.
 Propodeum with triangular teeth.

MATERIAL EXAMINED

Kenya: Londiani (*S. Patrizi*); Nyandura, Njabini (*V. Mahnert & J.-L. Perret*); Mt Elgon Nat. Pk., Koitoboa Peak (*V. Mahnert*).

Strumigenys marleyi Arnold

Strumigenys havilandi race *marleyi* Arnold, 1914: 31, fig. 10. Syntype workers, SOUTH AFRICA: Natal, Durban, ii.1914, 'in nest of *Pheidole punctulata*' (*F. B. Marley*) (SAM) [examined].
Strumigenys marleyi Arnold; Arnold, 1926: 286. [Raised to species.]
Strumigenys marleyi Arnold; Brown, 1954: 24.

WORKER. TL 2.4–2.5. HL 0.62–0.66, HW 0.48–0.50, CI 75–77, ML 0.22–0.24, MI 35–37, SL 0–30–0.32, SI 60–63, PW 0.28–0.31, AL 0.62–0.66 (2 measured).

Mandibles in full-face view broad basally and narrowing to the apex, with an exaggerated basal external angle and with a basal internal rounded lamina, both of which serve to increase the basal width of the blades. Apical fork of left mandible without intercalary teeth but the lower spiniform fork tooth with an adventitious tooth arising from its ventral basal surface which is about half the length of the lower fork tooth, and with a minute denticle between this adventitious tooth and the lower fork tooth. Apical armament of right mandible as left but the minute denticle may be absent. Both mandibular blades with 2 preapical teeth set close to the apex, the proximal of these larger than the distal. Upper scrobe margins shallowly convex and divergent from just behind the frontal lobes. Preocular notch absent. Eyes large, their maximum diameter distinctly greater than the maximum width of the scape. Ventral surface of head without a preocular transverse groove or impression. Antennal scapes weakly curved in the basal third, broadest at about the midlength, the leading edge shallowly convex and with a series of apically curved

spoon-shaped hairs. Dorsal surfaces of scapes with numerous short spatulate to narrowly spoon-shaped hairs present. In full-face view the cephalic dorsum densely clothed with conspicuous short scale-like to spoon-shaped hairs which are curved anteriorly; those hairs bordering the upper scrobe margins no larger than those on the dorsum. Cephalic dorsum without simple standing hairs of any description. Head finely but sharply punctate everywhere. Pronotal humeri without projecting hairs of any description, the mesonotum without standing hairs. Dorsal alitrunk only with short hairs similar to but sparser than those on the head. In profile the pronotum and mesonotum forming a single even convexity, the posterior portion of the mesonotum not suddenly depressed. Metanotal groove present across the dorsum as a very feebly impressed line, the impression visible in profile but extremely shallow and narrow. Propodeal teeth broad, laminar and confluent through most of their length with the broad sinuate infradental lamellae, both the teeth and the laminae appearing reticulate or even spongiform. Entirety of sides and dorsum of alitrunk densely punctate to reticulate-punctate. Spongiform appendages of pedicel segments strongly developed. Ventral appendage of petiole in profile deeper than the depth of the peduncle at its midlength and abruptly truncated posteriorly, the end of the spongiform appendage occurring directly below the highest point of the node. Lateral spongiform lobe of petiole large. Ventral spongiform lobe of postpetiole in profile large, its area distinctly greater than the exposed area of the postpetiolar disc. Lateral postpetiolar lobe almost as large as the ventral. Petiole node punctate dorsally, the postpetiole smooth. Posterior face of petiole node bordered by a translucent lamella. Postpetiolar disc in dorsal view with projecting spongiform tissue present all down the sides, posteriorly with a narrow translucent laminar strip. Base of first gastral tergite with a narrow laminar transverse strip, the basigastral costulae radiating from the lateral portions of this strip, on each side of a central clear area. Petiole, postpetiole and gaster with numerous stout standing hairs which are thickened apically. Colour yellowish brown.

Together with *pallestes*, *marleyi* forms a close species-pair characterized by their broad-based mandibles, distinctive apical mandibular armament, complete set of preapical teeth, relatively large eyes, absence of a preocular notch and completely reticulate-punctate sides to the alitrunk. The following characters separate the two species.

pallestes
HW 0.38–0.44, HL 0.52–0.58.
Pronotal humeri with a single straight hair which is clavate apically and is directed laterally.
Promesonotum at each side bordered by a longitudinal row of 4–5 short clavate standing hairs.
Metanotal groove not impressed.
Dorsum of petiole node weakly transversely striate.
Pronotal dorsum with longitudinal rugular sculpture.

marleyi
HW 0.48–0.50, HL 0.62–0.66.
Pronotal humeri without projecting hairs of any description.
Promesonotum not bordered by a row of standing hairs.
Metanotal groove feebly impressed.
Dorsum of petiole node punctate.
Pronotal dorsum reticulate-punctate, without rugular sculpture.

Strumigenys mesahyla sp. n.

(Fig. 69)

HOLOTYPE WORKER. TL 2.0, HL 0.57, HW 0.41, CI 75, ML 0.25, MI 43, SL 0.32, SI 75, PW 0.26, AL 0.58.

Apical fork of each mandible with 2 teeth, without intercalary teeth or denticles. Preapical armament of 2 teeth on each blade, the proximal longer than the distal and both teeth situated in the apical quarter to third of the length of the blade. Upper scrobe margins bordered by a narrow rim or flange which is broadest behind the frontal lobes and slowly peters out posteriorly; the eyes not visible in full-face view. Eyes very small, with only 4 ommatidia, the maximum diameter of the eye less than the maximum width of the scape. Preocular notch absent, the ventral surface of the head lacking a preocular transverse groove or impression. Scapes relatively slender, only moderately broadened in the median third and evenly shallowly curved in the basal third. Leading edges of scapes with an apically curved row of shallowly spoon-shaped hairs. Ground-pilosity of cephalic dorsum everywhere of broad flattened to spoon-shaped hairs which are curved anteriorly and which appear scale-like in full-face view. These hairs approximately the same size everywhere on the dorsum, not becoming much smaller on the posterior half. Hairs fringing the upper scrobe margins the same shape and size as those on the dorsum. Four stout standing hairs which are thickened apically are present in a transverse row close to the occipital margin; there is no pair of standing

hairs situated anterior to this row. Dorsum of head reticulate-punctate. Pronotal humeri each with a single long flagellate hair, the mesonotum with a single pair of stout standing hairs. Ground-pilosity of alitrunk of sparse scale-like hairs which are similar to those on the head but smaller. Metanotal groove represented by a faint line across the dorsum, the mesonotum sharply depressed behind the level of the pair of hairs. Propodeal teeth narrowly triangular and acute apically, confluent in their basal halves with the shallowly convex broad infradental lamellae. Sides of alitrunk mostly smooth, with vestigial traces of rugular sculpture anteriorly on the pronotum and with scattered peripheral patches of punctures on the pleurae and propodeum. Pronotal dorsum longitudinally rugulose, the remainder of the dorsal alitrunk punctate. Petiole node punctate dorsally, the postpetiole smooth and shining. Spongiform appendages of pedicel segments well developed. In profile the petiole with a broad ventral strip which projects into a lobe below the spiracle, and with a lateral lobe on the node. Postpetiole with large lateral and ventral spongiform lobes, the latter much larger than the exposed area of the postpetiolar disc in profile. Basigastral costulae sparse but quite sharply defined, arising on each side of a broad central clear area. Petiole, postpetiole and gaster with stout standing hairs which are thickened apically. Colour yellow.

PARATYPE WORKER. TL 2.1, HL 0.52, HW 0.41, CI 79, ML 0.22, MI 42, SL 0.30, SI 73, PW 0.24, AL 0.54.

As holotype but the infradental lamella of the propodeum not as evenly convex as indicated in Fig. 69 and the ventral spongiform lobe of the petiole more broadly triangular and only narrowly spongiform in front of the lobe.

Holotype worker, **Zimbabwe**: Bulawayo, Hillside, 8.ii.1914, in nest of *Solenopsis* sp. (*G. Arnold*) (BMNH).

Paratype. 1 worker, **Zimbabwe**: Victoria Falls, spray forest, iii.1969 (*W. L. Brown*) (MCZ).

The closest relative of *mesahyla* is *traegaordhi*, known only from South Africa. Details separating the two are tabulated under the latter name.

Strumigenys murshila sp. n.

(Fig. 77)

HOLOTYPE WORKER. TL 2.3, HL 0.58, HW 0.44, CI 76, ML 0.28, MI 48, SL 0.34, SI 77, PW 0.27, AL 0.58.

Mandibular blades slender and shallowly but distinctly bowed outwards in full-face view. Apical fork of each mandible with a pair of spiniform teeth, without intercalary teeth or denticles. Two preapical teeth present on each blade, the proximal longest and the distal tooth on the left mandible slightly smaller than that on the right. Length of left distal preapical tooth about equal to the distance separating its base from that of the proximal preapical tooth. Upper scrobe margins narrow anteriorly, the preocular laminae prominent, strongly divergent and evenly convex posteriorly but without a projecting bordering rim or flange. Eyes only partially visible in full-face view. Eyes very small, with only 5–6 ommatidia, their maximum diameter less than the maximum width of the scape. Preocular notch and ventral preocular transverse impression absent. Antennal scapes slender and more or less cylindrical, very weakly bent near the base where they are slightly narrowed. Leading edges of scapes equipped with a row of apically curved narrow spatulate hairs. Ground-pilosity of cephalic dorsum and hairs bordering the upper scrobe margins the same; hairs approximately the same length and thickness on all parts of the head, curved and narrowly spatulate, conspicuous. Upper scrobe margins without a row of much broader larger hairs which contrast with the ground-pilosity. Dorsum of head with 6 standing hairs, arranged in a transverse row of 4 close to the occipital margin, and a more anteriorly situated pair close to the highest point of the vertex. Dorsum of head sharply reticulate-punctate. Pronotal humeri each with a long fine flagellate hair. Mesonotum with a single pair of stout standing hairs. Sparse ground-pilosity of dorsal alitrunk of slender spatulate hairs which are shorter and narrower than those on the head. Metanotal groove a narrow transverse impression across the dorsum. In profile the anterior mesonotum slightly raised above the level of the posterior pronotum. Posterior portion of mesonotum depressed behind the level of the standing hairs, the metanotal groove impressed and the propodeum raised and convex behind the groove. Propodeal teeth narrowly triangular, the infradental lamellae narrow, confluent with only the basal third or so of the tooth. Sides of pronotum, extreme upper portions of the pleurae and propodeum punctate, the sides of the alitrunk otherwise smooth. Entire dorsal alitrunk reticulate-punctate, the pronotum also with a few weak overlying rugulae which are irregularly longitudinal. Petiole node punctate dorsally, the postpetiole longitudinally costulate-rugulose. Spongiform appendages of pedicel segments strongly developed. In profile the petiole with a curtain-like ventral process, the postpetiole with large lateral and ventral lobes of which the latter is larger than the exposed area of the postpetiolar disc in profile. Disc of postpetiole surrounded on all sides by spongiform material in dorsal view, the lateral spongiform lobes strongly prominent at the sides and the

posterior transverse strip broad. Basal strip of first gastral tergite lamellate spongiform, the basigastral costulae arising from it almost parallel and only weakly directed towards the midline, not conspicuously radiating from the lateral portions of the strip. Petiole, postpetiole and first gastral tergite with standing hairs which are slightly thickened apically. Colour brownish yellow, the gaster somewhat broader than the head and alitrunk.

Holotype worker, **Rwanda**: Rangiro, 10.vii.1973, 1800 m (*P. Werner*) (MHN).

Known only from the holotype *murshila* is nonetheless a very distinctive species of the *scotti*-complex characterized by its cephalic pilosity, small eyes and lack of a preocular notch, sculptured postpetiole and slender antennal scapes.

***Strumigenys nimbrata* sp. n.**

HOLOTYPE WORKER. TL 1.5, HL 0.43, HW 0.31, CI 72, ML 0.18, MI 42, SL 0.22, SI 71, PW 0.20, AL 0.37.

Outer margins of mandibles shallowly convex in full-face view, the blades narrowing basally and broadest at about the midlength. Apical fork of each mandible with 2 spiniform teeth, without intercalary teeth or denticles. Each mandible with 2 preapical teeth, a larger proximal tooth which is situated very close to the midlength of the blade, and a smaller distal preapical tooth which is close to the apical fork. The distance separating the bases of these two teeth is distinctly greater than the length of the distal preapical tooth. Upper scrobe margins with a narrow inconspicuous bordering rim or flange which is distinctly narrower than the maximum diameter of the eye. Eyes small, with only 4 ommatidia, the maximum diameter equal to or slightly less than the maximum width of the scape. Preocular notch absent, the ventral surface of the head without a preocular transverse groove or impression. Antennal scapes slender at the base and very weakly curved, the medial third slightly expanded and the leading edges with a row of apically curved narrow spoon-shaped hairs which are smaller than those fringing the upper scrobe margins. Funicular segments 2 and 3 vestigial and difficult to see, the separation of the two segments almost invisible and the length of segments 2 and 3 together less than half the length of segment 4 (the penultimate segment); under low magnification or in poor light the funiculus appears to consist of only 3 segments rather than the usual 5. Dorsum of head from posterior clypeal margin to about the midlength with conspicuous narrowly spoon-shaped pilosity which is curved anteriorly, and a double to triple row of these hairs border the upper scrobe margins. Behind the midlength the hairs are much smaller and sparser, narrow and inconspicuous; the pilosity of the two areas contrasting strongly. Dorsum of head with 6 standing hairs arranged in a transverse row of 4 close to the occipital margin and a more anteriorly situated pair. Dorsum of head reticulate-punctate. Pronotal humeri each with a single long fine flagellate hair. Mesonotum with a single pair of stout standing hairs. Ground-pilosity of dorsal alitrunk of sparse small hairs which are closely applied to the surface. Metanotal groove a feeble transverse line on the dorsum which is minutely impressed. Dorsum of mesonotum very shallowly concave in profile behind the level of the standing hairs, not sharply depressed. Propodeal teeth small and narrowly triangular, the infradental lamellae very narrow and pentering out ventrally, broadest where they join the teeth. Sides of alitrunk unsculptured. Pronotal dorsum very weakly and irregularly longitudinally rugulose, the remainder of the dorsal alitrunk and the petiole node reticulate-punctate. Postpetiole smooth in centre of disc but elsewhere with faint superficial reticulation. Spongiform appendages of pedicel segments much reduced, the peduncle of the petiole with a narrow ventral strip and the lateral lobe of the node minute. Petiole node broader than long in dorsal view. Ventral spongiform lobe of postpetiole smaller than the exposed area of the postpetiolar disc in profile. Basigastral costulae widely spaced and short, but sharply defined. Petiole, postpetiole and gaster with stout standing hairs which are thickened apically. Colour dull yellow to brownish yellow.

PARATYPE WORKERS. TL 1.5–1.8, HL 0.42–0.46, HW 0.31–0.35, CI 72–77, ML 0.17–0.20, MI 40–45, SL 0.22–0.24, SI 68–73, PW 0.19–0.23, AL 0.35–0.43 (12 measured).

As holotype, the eyes with 4–6 ommatidia and the sculpture showing some variation in intensity. The postpetiole may be as described above, or wholly smooth, or even have a few faint longitudinal rugulae towards the outer edges of the disc.

Holotype worker, **Ivory Coast**: Tai Forest, 17.x.1980 (*V. Mahnert & J.-L. Perret*) (MHN).

Paratypes. 31 workers and 1 female with same data as holotype (MHN; BMNH; MCZ; ENSA).

Non-paratypic material examined. **Ivory Coast**: Banco Forest (*I. Löbl*); Banco Forest (*W. L. Brown*); Divo (*L. Brader*); Monogaga (*V. Mahnert & J.-L. Perret*); Tai Forest (*V. Mahnert & J.-L. Perret*); Languedou (*V. Mahnert & J.-L. Perret*); Adiopodoume (*V. Mahnert & J.-L. Perret*). **Ghana**: Tafo (*B. Bolton*).

The size range of the non-paratypic material is HL 0.42–0.48, HW 0.31–0.37, CI 73–77, ML 0.17–0.21, MI 40–44, SL 0.22–0.26, SI 69–71. All this material matches the holotype. *S. nimbrata* is easily diagnosed by its very reduced funicular segments 2 and 3. Other characters aiding its recognition within the *arnoldi*-complex include the cephalic pilosity, position of the proximal preapical teeth and size of the distals, development of the infradental lamellae and spongiform appendages, and minute size. The only other species sharing the character of very reduced funicular segments is *bithertia*, but in this species the flange bordering the upper scrobe margins is very broad, the distal preapical tooth of the mandible is longer, the pronotal dorsum has distinct punctate sculpture between the rugulae, the petiole node is as broad as long in dorsal view and the propodeal teeth are much longer than in *nimbrata*.

***Strumigenys omalyx* sp. n.**

(Fig. 63)

HOLOTYPE WORKER. TL 2.3, HL 0.57, HW 0.45, CI 79, ML 0.23, MI 40, SL 0.31, SI 69, PW 0.26, AL 0.58.

Mandibles in full-face view of approximately the same width to the proximal preapical tooth, not evenly tapering from base to apex. Apical fork of 2 spiniform teeth on each mandible, without intercalary teeth or denticles. Each mandibular blade with 2 preapical teeth, the proximal much longer than the distal in each case. Upper scrobe margins with a narrow bordering rim or flange, the eyes not visible in full-face view. Eyes small, with only 5–6 ommatidia, the maximum diameter of the eye conspicuously much less than the maximum width of the scape. Preocular notch absent, the ventral surface of the head without a transverse preocular groove or impression. Antennal scapes shallowly bent at about the basal third, somewhat dorsoventrally flattened and broadest at about the midlength, their leading edges distinctly convex and equipped with a row of apically curved large spatulate to spoon-shaped hairs which are as large as or slightly larger than those fringing the upper scrobe margins. Dorsum of head in full-face view clothed with broad scale-like to stud-like hairs which do not decrease in size posteriorly on the dorsum. Cephalic dorsum with a transverse row of 4 stout standing hairs close to the occipital margin, without a more anteriorly situated pair close to the highest point of the vertex. Head densely and strongly reticulate-punctate everywhere. Pronotal humeri without flagellate hairs, lacking projecting hairs of any description. Mesonotum with a single pair of stout standing hairs which are broadly clavate apically. Ground-pilosity of dorsal alitrunk of sparse scattered scale-like hairs. Metanotal groove feebly marked across the dorsum but not impressed. Propodeal teeth triangular, broad in profile and confluent for approximately their basal halves with the broad sinuate infradental lamellae. Sides of pronotum densely reticulate-punctate, the pleurae and sides of the propodeum smooth except for peripheral puncturation. Dorsal alitrunk densely reticulate-punctate everywhere, the pronotum not overlaid by longitudinal rugulae. Dorsum of petiole node reticulate-punctate, the postpetiolar disc longitudinally striolate to punctate-striolate, the sculpture denser towards the sides of the disc than at the centre. Spongiform appendages of pedicel segments well developed, the ventral spongiform lobe of the postpetiole larger than the lateral lobe and equal to or slightly larger than the exposed area of the postpetiolar disc in profile. Basigastral costulae arising on each side of a central clear area. Petiole, postpetiole and first gastral tergite with standing stout hairs which are clavate apically. Colour light brown.

PARATYPE WORKERS. TL 2.0–2.4, HL 0.49–0.60, HW 0.41–0.46, CI 75–80, ML 0.19–0.23, MI 35–40, SL 0.26–0.32, SI 65–71, PW 0.24–0.28, AL 0.49–0.60 (15 measured).

As holotype but in some the postpetiolar disc is more strongly sculptured, the central portion reticulate-punctate and the lateral portions striolate.

Holotype worker, **Kenya**: Tana R., Sankuri, 160 m, 18.x.1977 (V. Mahnert & J.-L. Perret) (MHN).

Paratypes. 42 workers and 4 females with same data as holotype (MHN; BMNH; MCZ; ENSA).

Non-paratypic material examined. **Kenya**: Lamu, nr Witu (V. Mahnert & J.-L. Perret).

Closest related to *arnoldi* and sharing that species' lack of pronotal flagellate hairs whilst retaining a complete mandibular dentition of 2 preapical teeth on each blade. *S. omalyx* is separated from *arnoldi* by the presence in the former of sculptured pronotal sides and postpetiolar disc, and a lack of longitudinal rugulae on the pronotal dorsum. In *arnoldi* the pronotum is smooth laterally, the disc of the postpetiole is smooth and longitudinal rugulae are present on the pronotal dorsum.

Strumigenys pallestes Bolton

(Fig. 59)

Strumigenys pallestes Bolton, 1971: 62, figs 2, 3. Holotype worker, paratype workers and female, GHANA: Eastern Region, New Tafo, Cocoa Res. Inst. Ghana, mossy rot hole in trunk of cocoa tree, 22.vii.1970 (B. Bolton) (BMNH; MCZ) [examined].

WORKER. TL 2.0–2.2, HL 0.52–0.58, HW 0.38–0.44, CI 70–77, ML 0.18–0.21, MI 32–36, SL 0.24–0.26, SI 57–62, PW 0.24–0.30, AL 0.52–0.60 (20 measured).

Mandibles in full-face view broad basally and tapering towards the apices, the inner margin with a large basal lamellate lobe whose apex is directed posteriorly and is concealed by the clypeus when the mandibles are closed. External margins of mandibles with an accentuated basal angle, the blades enclosing a central vacuity at full closure, the vacuity broadest distally and tapering towards the base. Apical fork of each mandible consisting of a pair of spiniform teeth, lacking intercalary teeth or denticles. Ventral margin of lower fork tooth with a smaller adventitious tooth arising near its base, and with a minute denticle present basally between this adventitious tooth and the lower fork tooth. Each mandibular blade with 2 preapical teeth, the proximal the longest. Eyes not visible in full-face view, concealed by the projecting upper scrobe margins. Preocular notch absent, the ventral surface of the head without a preocular groove or impression. Eyes moderate in size, with 5–6 ommatidia in the greatest diameter, their maximum diameter equal to or only fractionally less than the maximum width of the scape. Antennal scapes weakly curved basally, slightly expanded and broadest at about the midlength, their leading edges with a row of curved spoon-shaped small hairs. Dorsum of head densely clothed with short broad flattened hairs which appear scale-like to short spatulate in full-face view, the upper scrobe margins densely fringed by hairs similar in shape and size to those on the leading edges of the scapes. Dorsum of head with a transverse row of 4 short standing hairs close to the occipital margin. Head reticulate-punctate everywhere. Pronotal humeri each with a laterally projecting straight clavate hair. Lateral margins of promesonotal dorsum with a row of 4–5 clavate hairs on each side, the first 1–2 of these curve towards the midline, the remaining 3 are more or less straight. Ground-pilosity of dorsal alitrunk like that on head but the hairs sparser, frequently somewhat smaller and slightly more elevated. Metanotal groove absent. Mesonotum not depressed posteriorly, instead the promesonotum forming a single more or less evenly curved surface in profile. Propodeal teeth subtended by broad convex infradental lamellae. Sides of alitrunk uniformly reticulate-punctate everywhere. Pronotal dorsum longitudinally rugulose, usually with punctures between the rugulae. Remainder of dorsal alitrunk densely reticulate-punctate. Dorsum of petiole node weakly transversely striate, the postpetiole smooth. Spongiform appendages of pedicel segments large, the petiole ventrally with a spongiform strip which is as deep as the peduncle. Ventral spongiform lobe of postpetiole distinctly larger than the exposed area of the postpetiolar disc in profile, and larger than the lateral lobe. In dorsal view the postpetiole narrow, only slightly broader than the petiole. Basigastral costulae dense, radiating on each side of a central clear area. Dorsal surfaces of petiole, postpetiole and gaster with numerous short standing hairs which are clavate apically. Colour dull yellow to brownish yellow.

In the Afrotropical region only *pallestes* and *marleyi* share the strange mandibular shape and odd dentition described above. The characters separating these two species are listed under *marleyi*.

S. pallestes is one of the very few arboreal species of *Strumigenys* known from Africa. All the series listed below were collected from rot holes in tree trunks or branches, or from isolated workers wandering on the bark of a tree.

MATERIAL EXAMINED

Ghana: Tafo (B. Bolton); Baudua (*D. Leston*). Nigeria: Gambari (B. Bolton); Gambari (B. Taylor).

Strumigenys paranax sp. n.

HOLOTYPE WORKER. TL 1.8, HL 0.47, HW 0.34, CI 72, ML 0.19, MI 40, SL 0.25, SI 74, PW 0.23, AL 0.46.

Mandibles slender and shallowly curved along their external borders, tapering gradually from base to apex. Apical fork of each mandible of 2 teeth, without intercalary teeth or denticles. Left mandibular blade with only 1 preapical tooth (the proximal), right mandible with 2 preapical teeth present. Upper scrobe margins gradually divergent, the eyes partially visible in full-face view. Eyes small, with only 4 ommatidia, their maximum diameter less than the maximum width of the scape. Preocular notch absent, the ventral surface of the head without a transverse preocular groove or impression. Antennal scapes shallowly curved in the basal third, only slightly broadened medially; the leading edges equipped with a row of apically curved spoon-shaped hairs which are slightly smaller than those fringing the upper scrobe margins.

Ground-pilosity of head reduced and sparse, consisting of inconspicuous small flattened hairs. Upper scrobe margins with a double or triple row of large spoon-shaped hairs which are curved anteriorly and are much more conspicuous than the ground-pilosity. Dorsum of head with 6 standing hairs arranged in a transverse row of 4 close to the occipital margin and a more anteriorly situated pair. Cephalic dorsum reticulate-punctate. Pronotal humeri each with a single straight stout hair which is clavate apically, without the elongate fine flagellate hair usually seen in this position. Mesonotum with a single pair of short broadly clavate standing hairs. Ground-pilosity of dorsal alitrunk consisting of small flattened hairs which are closely applied to the surface, similar to those found on the head. Metanotal groove a transverse line on the dorsum, weakly impressed in profile. Mesonotum in profile not sharply depressed behind the level of the pair of hairs, instead the dorsum of the mesonotum forming a more or less even slope to the metanotal groove. Propodeal teeth small and triangular, subtended by infradental lamellae. Sides of alitrunk smooth except for peripheral punctures round the pleurae and propodeum. Dorsum of pronotum with widely spaced longitudinal rugulae, the remainder of the dorsal alitrunk reticulate-punctate. Petiole node punctate, the postpetiole smooth. Spongiform appendages of pedicel segments small, the petiole with only a very narrow ventral strip and the ventral spongiform lobe of the postpetiole smaller than the exposed area of the postpetiolar disc in profile. Basigastral costulae short but sharply defined, arising across the width of the tergite rather than radiating from each side of a broad central clear area. Petiole, postpetiole and gaster dorsally with stout clavate standing hairs. Colour brownish yellow.

PARATYPE WORKERS. TL 1.7–1.8, HL 0.45–0.46, HW 0.32–0.34, CI 70–74, ML 0.17–0.19, MI 37–41, SL 0.24–0.25, SI 73–75, PW 0.22–0.24, AL 0.42–0.46 (4 measured).

As holotype but some have the mesonotal dorsum shallowly concave in profile.

Holotype worker, **Cameroun**: Nkoemvon, 1979 (*D. Jackson*) (BMNH).

Paratypes. **Gabon**: 1 worker, Ile aux Singes, IS 1–4 (*J. A. Barra*) (MCZ). **Cameroun**: 1 worker, Fo Tabe, 19.i.1937 (no collector's name) (BMNH).

Non-paratypic material examined. **Cameroun**: nr Yaounde (*G. Terron*).

Of the four *arnoldi*-complex species in which only a single preapical tooth is present on the left mandible, *irrorata* is identified by its possession of only a single preapical tooth on the right mandible also, and *katapelta* by its possession of intercalary small teeth between the teeth of the apical mandibular fork. Of the two species remaining, which have 2 preapical teeth on the right mandible and lack intercalary teeth, *dextra* is recognized by having a long fine flagellate hair at each of the pronotal humeri, whilst *paranax* has a stout straight strongly clavate hair in this position.

Strumigenys petiolata Bernard sp. rev.

(Figs 58, 71)

Strumigenys petiolata Bernard, 1952: 254, figs 14 H–J. Syntype workers, GUINEA: Mt Nimba, 700 m, in territory in forest (*Villiers*) (not found in MNHN; presumed lost). [Previously synonymized with *rufobrunnea* by Brown, 1954: 17.]

WORKER. TL 2.0–2.5, HL 0.54–0.68, HW 0.40–0.53, CI 75–83, ML 0.24–0.32, MI 44–50, SL 0.28–0.36, SI 64–72, PW 0.25–0.32, AL 0.50–0.64 (38 measured).

Mandibles in full-face view with the outer margins shallowly convex, the blades feebly bowed outwards. Apical fork of each mandible consisting of a pair of spiniform teeth, without intercalary teeth or denticles. Preapical armament of each mandibular blade of 2 teeth, the proximal spiniform and the longest in each case. Right distal preapical tooth usually larger than the left. Upper scrobe margins shallowly sinuate in full-face view and bordered by a narrow rim or flange throughout their length. Eyes visible in full-face view, their maximum diameter equal to or greater than the maximum width of the scape. Preocular notch present and strongly developed, the anterior portion of the eye detached from the side of the head. Preocular notch continued onto ventral surface of head as a transverse groove which is narrower than the maximum diameter of the eye and which usually has quite sharply defined margins. Antennal scapes not or only extremely shallowly bent basally, broadest at about the midlength and their leading edges equipped with a row of apically curved narrowly spoon-shaped hairs which are slightly smaller than those on the upper scrobe margins. Cephalic ground-pilosity of minute inconspicuous spatulate to spoon-shaped hairs which are closely applied to the surface. Upper scrobe margins with a row of anteriorly curved large spoon-shaped hairs. Dorsum of head with 6 standing hairs which are arranged in a transverse posterior row of 4 close to the occipital margin and a more anteriorly situated pair. Head finely and usually very sharply

reticulate-punctate but in some samples the sculpture is less intensely developed, the punctures not so sharply incised. Pronotal humeri lacking flagellate or any other kind of outstanding hair. Mesonotum with a single pair of stout standing hairs. Ground-pilosity of alitrunk of minute hairs similar to those on the cephalic dorsum. Posterior half of mesonotum sharply depressed behind the level of the standing hairs. Metanotal groove represented by a line across the dorsum but not or only very feebly impressed. Propodeal teeth triangular and subtended by an infradental lamella on each side. Sides of alitrunk with the pleurae smooth except for peripheral punctulae which are best developed dorsolaterally. Sides of propodeum above and behind the spiracle punctulate. Sides of pronotum varying from smooth to very weakly striolate, sometimes also with vestigial punctures. Pronotal dorsum usually finely longitudinally striolate or costulate, often with fine superficial punctures between the longitudinal sculpture. Frequently the costulae or striae are poorly defined and the punctures more conspicuous, and in some samples dense punctures constitute the principal component. Dorsal alitrunk behind pronotum densely reticulate-punctate. Petiole node punctate dorsally, the postpetiole often with some fine longitudinal striolae but these are very variable in development and frequently are absent. Petiole with a narrow ventral spongiform strip whose depth is less than half the depth of the peduncle at its midlength. Sides of petiole node with a small triangular appendage. Ventral spongiform lobe of postpetiole usually marginally larger than the lateral lobe in profile. Petiole, postpetiole and gaster with standing hairs. Colour often uniform, varying in shade from yellow to dark brown or even blackish brown; sometimes with the gaster considerably darker in colour than the head and alitrunk.

One of the most successful and widely distributed *Strumigenys* of the Afrotropical region, *petiolata* nests in rotten wood, under the bark of more recently fallen timber, in log mould, or sometimes directly into the soil. The workers forage singly in the topsoil, leaf litter or in rot tunnels in wood.

As I have not been able to find the types of *petiolata* my interpretation of this name and its application to this common species must remain somewhat shadowed with doubt. The interpretation is based on Bernard's insufficient original description and figure and supplemented by the notes in Brown's (1954) revision, in which he treated *petiolata* as a synonym of *rufobrunea*. Since that time considerably more material has been amassed and it was noted that Brown's *rufobrunea* consisted of more than one species. In particular a number of West African samples with pronotal flagellate hairs, narrower heads and overall smaller size, were found to match the *rufobrunea* types perfectly, and the South African *faurei* type (also included as a synonym of *rufobrunea* by Brown) has also proved to be a separate species. This left the common species which lacked pronotal flagellate hairs, and which formed the bulk of Brown's concept of *rufobrunea*, with the possible available name of *petiolata*, now applied here. Admittedly Bernard's description could apply to any of the names mentioned above but his figure does not show pronotal flagellate hairs and neither are such hairs mentioned in the description. Because of this, and because the species is so common in West Africa, I have decided that the name *petiolata* is most probably applied to the following material, with the diagnostic characters described above.

MATERIAL EXAMINED

Ivory Coast: Man (V. Mahnert & J.-L. Perret); Tai Forest (V. Mahnert & J.-L. Perret); Issoneu (V. Mahnert & J.-L. Perret); Sassandra (I. Löbl); Banco Forest (I. Löbl); Divo (L. Brader); Gagnoa (L. Brader). **Ghana:** Enchi (D. Leston); Legon (D. Leston); Tafo (D. Leston); Tafo (B. Bolton); Tafo (C. A. Collingwood); Mampong (P. Room); Mt Atewa (B. Bolton). **Nigeria:** Ibadan (A. Russell-Smith); Gambari (B. Bolton); Apoje (B. Taylor). **Cameroun:** Nkoemvon (D. Jackson); nr Yaounde (G. Terron); Batanga (G. Schwab). **Gabon:** Makokou (I. Lieberburg); Makokou (W. H. Gotwald); Plateau d'Ipassa (J. A. Barra); Ile aux Singes (J. A. Barra). **Central African Republic:** Haut Mbomu (N. A. Weber). **Angola:** Dundo (L. de Carvalho); R. Chicapa (L. de Carvalho). **Sudan:** Khor Aba (N. A. Weber).

Strumigenys pretoriae Arnold

(Fig. 53)

Strumigenys pretoriae Arnold, 1949: 267, fig. 8. Syntype workers, SOUTH AFRICA: Transvaal, Pretoria, 22.i.1946 (E. K. Hartwig) (SAM) [examined].

Strumigenys pretoriae Arnold; Brown, 1954: 15.

WORKER. TL 2.3–3.0, HL 0.59–0.70, HW 0.43–0.54, CI 71–77, ML 0.26–0.31, MI 40–44, SL 0.33–0.40, SI 69–77, PW 0.27–0.33, AL 0.58–0.70 (5 measured).

Mandibular blades broad and powerful, the outer margins shallowly convex. Apical fork of each mandible of 2 teeth, without intercalary teeth or denticles. Each mandibular blade with 2 preapical teeth, crowded close to the mandibular apex, the proximal teeth larger than the distal. Upper scrobe margins in full-face view constricted immediately behind the frontal lobes; behind the constriction diverging posteriorly in an almost straight line on each side which passes directly above the inner margin of the eye on each side so that the latter is clearly visible in full-face view. Eyes very large, larger than in any other Afrotropical *Strumigenys*, their maximum diameter 0.23–0.24×HW; in full-face view the maximum eye diameter more than twice the width of the scape at its broadest. Preocular notch present, the anteriormost portion of the eye detached from the side of the head. Preocular notch continued onto ventral surface of head as an extensive impressed area. Antennal scapes quite slender, very feebly bent in the basal third, the leading edges with a row of apically curved spoon-shaped hairs. Dorsum of head clothed with short broad spoon-shaped hairs which are curved anteriorly and appear scale-like in full-face view. Hairs bordering the upper scrobe margins the same as those on the cephalic dorsum but slightly larger. Vertex of head with 4 simple standing hairs arranged in a transverse row close to the occipital margin, without a pair situated anterior to this row. Dorsum of head densely reticulate-punctate. Pronotal humeri without flagellate or any other kind of projecting hairs. Mesonotum with a single pair of standing hairs. Ground-pilosity of dorsal alitrunk of small broadly spoon-shaped to scale-like hairs, like those on the head but not so dense. In profile the posterior portion of the mesonotum slightly depressed, the metanotal groove minutely impressed. Propodeal teeth lamellate, subtended by broad infradental lamellae which are confluent with the basal margins of the teeth for about half of their length. Central areas of pleurae smooth but peripherally with punctate sculpture. Sides of pronotum with faint striolate markings. Pronotal dorsum finely longitudinally rugulose, the remainder of the dorsal alitrunk finely reticulate-punctate. Petiole node superficially reticulate-punctate, the postpetiole smooth or with traces of faint longitudinal costulae or striolae. Spongiform appendages of pedicel segments strongly developed. In profile the petiole with a large ventral strip which is almost as deep as the peduncle at its midlength; the lateral lobe extensive. Ventral and lateral lobes of postpetiole large and spongiform, the former larger than the exposed area of the postpetiolar disc in profile. Sides of postpetiole surrounded by projecting spongiform material in dorsal view. Base of first gastral tergite with a lamellate transverse strip from the more lateral portions of which the dense and sharply defined basigastral costulae arise. Petiole, postpetiole and gaster with standing hairs which are more or less simple or slightly expanded apically. Colour dull yellow to light yellowish brown.

S. pretoriae is immediately separated from its Afrotropical congeners by its very large eyes; no other species even approaches the ocular development seen here. Its closest relatives are *shaula*, *dromoshaula* and *dyshaula* but in all of these the pronotal humeri are equipped with flagellate hairs and the cephalic dorsum lacks the dense scale-like ground-pilosity characteristic of *pretoriae*.

MATERIAL EXAMINED

Botswana: Maxwee (A. Russell-Smith). **South Africa:** Transvaal, Nelspruit (M. Samways); Pretoria (E. K. Hartwig).

Strumigenys relahyla sp. n

(Figs 57, 74)

HOLOTYPE WORKER. TL 2.0, HL 0.56, HW 0.41, CI 73, ML 0.24, MI 43, SL 0.28, SI 68, PW 0.26, AL 0.52.

Apical fork of mandibles with 2 spiniform teeth, without intercalary teeth or denticles. Preapical armament of 2 teeth on each blade, the proximal longest, the distal about as long as, or slightly longer than, the distance separating the bases of the preapical teeth. Outer margins of mandibles shallowly convex in full-face view and the occipital margin broadly concave. Upper scrobe margins with a very narrow bordering rim or flange, the eyes mostly visible in full-face view. Maximum diameter of eye about 0.15×HW, slightly greater than the maximum width of the scape. Preocular notch present, narrow but distinct, the anterior portion of the eye not detached from the side of the head and the preocular notch not extended onto the ventral surface of the head as a transverse groove or impression. Antennal scapes feebly bent basally, broadened in the middle third, the leading edge equipped with a row of narrow spoon-shaped hairs which are smaller than those fringing the upper scrobe margin. Cephalic ground-pilosity of inconspicuous small spatulate hairs, the upper scrobe margins with a projecting row of large anteriorly curved spoon-shaped hairs. Dorsum of head with 6 standing hairs arranged in a transverse row of 4 close to the occipital margin and a more anteriorly situated pair. Dorsum of head finely reticulate-punctate.

Pronotal humeri each with a single long fine flagellate hair. Mesonotum with a single pair of stout standing hairs. Ground-pilosity of dorsal alitrunk of fine spatulate hairs similar to those on the head. Posterior portion of mesonotum depressed behind the level of the pair of hairs, with a shallow transverse impression immediately behind the descending slope. Remainder of mesonotum and dorsum of propodeum convex. Metanotal groove forming a transverse line on the dorsum. Propodeal teeth lamellate, confluent for slightly more than half their length with the conspicuous infradental lamellae. Sides of alitrunk unsculptured except for some faint scratch-like costulae on the pronotum and some feeble peripheral punctulation on the pleurae and propodeum. Pronotal dorsum longitudinally finely costulate-rugulose, the remainder of the alitrunk punctate. Dorsum of petiole node shallowly punctate, the postpetiole smooth. Spongiform appendages of pedicel segments moderately developed, the petiole with a thin ventral strip and small lateral lobe. Ventral spongiform lobe of postpetiole larger than the lateral lobe and larger than the exposed area of the postpetiolar disc in profile. Basigastral costulae relatively sparse, without secondary costulae arising between those which have their origins on the basal gastral strip. Petiole, postpetiole and gaster dorsally with standing hairs. Colour yellowish brown, the gaster darker.

PARATYPE WORKERS. TL 1.9–2.0, HL 0.54–0.56, HW 0.40–0.41, CI 73–76, ML 0.23–0.24, MI 43–44, SL 0.26–0.28, SI 65–68, PW 0.25–0.27, AL 0.51–0.54 (4 measured). As holotype.

Holotype worker, **Angola**: Duque de Braganca Falls, 12.iii.1972, riverbank (*P. Hammond*) (BMNH).

Paratypes. 4 workers with same data as holotype (BMNH; MCZ).

Non-paratypic material examined. **Cameroun**: nr Yaounde (*G. Terron*). **Zaire**: Ituri Forest, Beni-Irumu (*N. A. Weber*). **Angola**: Dundo (*L. de Carvalho*); R. Camudembele (*L. de Carvalho*); R. Mussungue (*L. de Carvalho*); Dundo (*A. Machado*).

Size range of non-paratypic material is HL 0.50–0.53, HW 0.36–0.41, CI 72–77, ML 0.22–0.24, MI 44–46, SL 0.25–0.27, SI 66–69 (10 measured). Resembling the holotype but with variable colour ranging from uniform pale brown, through medium brown with the gaster darker, to uniform dark brown. The size of the ventral spongiform lobe of the postpetiole shows some variation but is always at least as large as the exposed area of the disc in profile. The distal preapical teeth of the mandibular blades are usually as described above but in a few samples they are shorter than the distance separating the bases of the two preapical teeth. *S. relahyla* belongs to a small aggregation of species in which the preocular notch is present but small, and is not extended onto the ventral surface of the head as a groove or impression. Of the species thus defined *relahyla* is distinguished by a lack of specialized characters when compared to the others. In *totyla* the pronotal humeri lack flagellate hairs; in *xenohyla* the scape hairs are very large and spoon-shaped, like those on the upper scrobe margins; in *adrasora* the spongiform appendages of the petiole and postpetiole are much reduced; in *rukha* the spongiform appendages are strongly developed; and in *dyshaula* the head is more narrowly and deeply impressed at the occipital margin.

Strumigenys rogeri Emery

(Figs 51, 72)

Strumigenys rogeri Emery, 1890: 68, pl. 7, fig. 6. Holotype worker, ST THOMAS I. (West Indies) (MCSN) [examined].

Strumigenys incisa Godfrey, 1907: 102 [attributed to Forel]. Syntype workers, GREAT BRITAIN: Scotland, Edinburgh, hothouse in Royal Botanic Garden, 10.vi.1904 (*R. Godfrey*) (BMNH) [examined]. [Synonymy by Donisthorpe, 1915: 341.]

Strumigenys sulfurea Santschi, 1915: 261. Syntype workers, GABON: Samkita (*F. Faure*) (NMB) [examined]. [Synonymy by Brown, 1954: 20.]

Strumigenys rogeri Emery; Brown, 1954: 20.

WORKER. TL 2.3–2.8, HL 0.58–0.74, HW 0.42–0.52, CI 69–75, ML 0.31–0.40, MI 51–58, SL 0.36–0.46, SI 82–89, PW 0.27–0.32, AL 0.58–0.68 (40 measured).

Mandibular blades almost straight and at full closure nearly parallel, not obviously bowed outwards. Apical fork of each blade with 2 spiniform teeth, without intercalary teeth or denticles. Preapical armament of 2 teeth on each blade, set in the distal third of the blade's length; the proximal preapical teeth larger than the distals. Upper scrobe margins narrowly concave immediately behind the frontal lobes, with a pinched-in appearance in full-face view. Behind this the upper scrobe margins feebly divergent to the level of the eye and relatively close together, sometimes even shallowly concave directly above the eye, then

diverging strongly to the scrobal apices. Eyes plainly visible in full-face view, the preocular notch strongly developed and the anterior portion of the eye detached from the side of the head. Preocular notch continued onto the ventral surface of the head as a broad impression which runs transversely immediately in front of the level of the eye, but not reaching the ventral midline. Antennal scapes long and slender, approximately straight, the leading edges equipped with a row of narrowly spatulate hairs which are angled towards the apex. Dorsum of head with short narrowly spatulate ground-pilosity which is directed anteriorly, the upper scrobe margins with a row of larger anteriorly curved spoon-shaped hairs. With the head in profile the dorsum with 6 standing hairs which are arranged as a row of 4 transversely close to the occipital margin and a more anteriorly situated pair. Dorsum of head reticulate-punctate. Pronotal humeri each with a long fine flagellate hair and the mesonotum with a single pair of stout standing hairs. Otherwise the dorsal alitrunk without standing hairs, the ground-pilosity of sparse narrow hairs which are closely applied to the surface. With the alitrunk in profile the posterior portion of the mesonotum sharply depressed, the metanotal groove represented by a transverse line across the dorsum but not or only minutely impressed. Propodeal teeth triangular and subtended by narrow infradental lamellae. Sides of alitrunk sometimes completely smooth but usually the propodeum punctulate and the pronotum with faint traces of striolate or costulate sculpture anteriorly. Pronotal dorsum longitudinally striolate or costulate on a finely punctate surface, but in some the costulae may be very feeble and indistinct; the median costula is usually stronger and more sharply defined than any other and in many samples forms a weak median longitudinal carina at least on the anterior half of the pronotum. Remainder of dorsal alitrunk reticulate-punctate. Dorsum of petiole node weakly reticulate-punctate, the postpetiole generally smooth but sometimes with vague sculptural vestiges. Petiole in profile with a spongiform ventral strip and the node with a transverse collar posteriorly. In profile the postpetiole with large ventral and lateral spongiform lobes. In dorsal view the postpetiole with a posterior spongiform strip which abuts a similar but narrower strip on the base of the first tergite. Basigastral costulae sparse but sharply defined. Dorsal surfaces of petiole, postpetiole and gaster with stout standing hairs which are weakly swollen apically. Colour dull yellow to light medium brown.

Among the members of the *rogeri*-complex in which the preocular notch is strongly developed and extends onto the ventral surface of the head as a transverse groove or impression, *rogeri* is characterized by its simple dentition (without intercalary teeth in the apical fork and with a full complement of preapical teeth), relatively long straight mandibles, long antennal scapes, presence of pronotal flagellate hairs, and presence of characteristically shaped upper scrobe margins which lack a projecting laminar rim or flange.

S. rogeri is a well known and very efficient tramp species, probably of West African origin but very widely distributed in the tropics by human commerce. It has also been recorded from hothouses and other constantly heated buildings in the temperate zone. Brown (1954) gives observations on the biology of *rogeri* which were made by Wilson in Cuba. In West Africa the species usually nests in rotten wood on the ground or under the bark of larger fallen trunks or branches, but on occasion it will nest directly in the soil or in wood which has crumbled almost to powder. The Neotropical distribution of *rogeri* is summarized by Brown (1962*b*) and Kempf (1972), and the Pacific distribution by Wilson & Taylor (1967).

MATERIAL EXAMINED

Afrotropical material. **Ivory Coast:** Tai Forest (V. Mahnert & J.-L. Perret); Bingerville (V. Mahnert & J.-L. Perret); Languedou (V. Mahnert & J.-L. Perret); Issoneu (V. Mahnert & J.-L. Perret); Sassandra (I. Löbl); Man (I. Löbl); Sangouine (I. Löbl); Divo (L. Brader); Banco Forest (W. L. Brown); Nzi Noua (W. L. & D. E. Brown). **Ghana:** Tafo (B. Bolton); Tafo (D. Leston). **Nigeria:** Gambari (B. Bolton). **Cameroun:** Nkoemvon (D. Jackson); nr Yaounde (G. Terron). **Gabon:** Samkita (F. Faure); Plateau d'Ipassa (J. A. Barra); Makokou (I. Lieberburg). **Angola:** Gubela (P. Hammond); R. Chicapa (L. de Carvalho); Cossa (L. de Carvalho). **Burundi:** Bujumbura (A. Dejean).

Other regions. **Solomon Is:** Guadalcanal (E. S. Brown). **Hawaii** (F. X. Williams). **New Hebrides:** Santo (L. Weatherill); Port Vila (L. Weatherill). **Wallis Is:** Uvea (G. Hunt). **Fiji Is:** Viti Levu (W. L. & D. E. Brown). **Malaysia:** Sarawak, Gunong Mulu Nat. Pk. (B. Bolton). **Great Britain:** Scotland, Edinburgh (R. Godfrey). **West Indies:** St Thomas I.; Montserrat (N. A. Weber); Dominica (N. A. Weber). **Cuba:** Trinidad Mts (W. M. Mann); Soledad (W. M. Mann). **Puerto Rico:** Mayaquez (M. R. Smith); Como Springs (W. M. Wheeler); El Yunque (E. O. Wilson). **Jamaica:** St Ann Parish (M. Fiske); James Hill. **Trinidad:** Tumpuna Res. (J. Noyes); Pitch Lake (N. A. Weber). **Haiti:** Moca (Russo); Mts N. of Jacmel (W. M. Mann). **Panama:** Barro Colorado I. (A. Newton). **Guiana:** R. Mazaruni (N. A. Weber). **Ecuador:** Pichincha, St Domingo (S. & J. Peck). **Seychelles:** Cousin I. (G. M. Bathe).

Strumigenys rufobrunnea Santschi

Strumigenys rufobrunnea Santschi, 1914b: 373. Lectotype female (designated by Brown, 1954: 17), and paralectotype worker, GUINEA: Conakry (*F. Silvestri*) (NMB) [examined].

Strumigenys rufobrunnea Santschi; Brown, 1954: 17.

WORKER. TL 1.8–2.0, HL 0.48–0.53, HW 0.36–0.40, CI 73–76, ML 0.22–0.25, MI 45–48, SL 0.25–0.29, SI 69–74, PW 0.23–0.25, AL 0.42–0.49 (12 measured).

Mandibles in full-face view with the outer margins shallowly convex, the blades slightly bowed outwards. Apex of each mandible with 2 spiniform fork teeth, without intercalary teeth or denticles. Preapical armament of each mandible of 2 teeth, the proximal spiniform and longer than the distal; in general the distal preapical tooth of the left mandible slightly shorter than that of the right. Distance separating the bases of the preapical teeth on the left mandible at least as great as the length of the distal preapical tooth and usually greater. Upper scrobe margins shallowly sinuate rather than straight, bordered by a narrow rim or flange throughout their length. Eyes of moderate size, not concealed by the upper scrobe margins and visible in full-face view, their maximum diameter greater than the maximum width of the scape. Preocular notch present and strongly developed, the anterior portion of the eye detached from the side of the head. Preocular notch extended onto the ventral surface of the head as a transverse impression in front of the eye. Antennal scapes very shallowly bent in the basal third, slightly expanded in the median third and broadest at about the midlength. Leading edges of scapes with a row of apically curved hairs which are spatulate to narrowly spoon-shaped and conspicuously smaller than the hairs bordering the upper scrobe margins. Ground-pilosity of cephalic dorsum of inconspicuous small spatulate hairs which are closely applied to the surface, the upper scrobe margins with a very obvious row of larger broadly spoon-shaped hairs which are curved anteriorly. Dorsum of head with 6 standing hairs arranged in a transverse row of 4 close to the occipital margin and a more anteriorly situated pair. Dorsum of head reticulate-punctate. Pronotal humeri each with a single fine flagellate hair. Mesonotum with a single pair of standing hairs, the dorsal alitrunk otherwise with only sparse appressed minute pilosity similar to that which forms the cephalic ground-pilosity. Posterior portion of mesonotum depressed behind the level of the standing hairs. Metanotal groove present as a line across the dorsum which is not or only very feebly impressed. Propodeal teeth triangular and subtended by a moderately developed infradental lamella which is confluent with the tooth for about half its length. Sides of pronotum showing vestigial costulate or striolate sculpture, or traces of punctures which are almost effaced. Pleurae smooth except for some peripheral punctulation. Pronotal dorsum finely longitudinally costulate or rugulose, sometimes with feeble punctures between the costulae. Remainder of dorsal alitrunk densely reticulate-punctate. Dorsum of petiole node densely and quite strongly reticulate-punctate, the node itself slightly broader than long but not a narrow transverse rectangle. Postpetiole smooth or rarely with vestiges of longitudinal striolate sculpture laterally. Spongiform appendages of pedicel segments moderately developed, the ventral petiolar strip spongiform but usually confined to the posterior two-thirds of the length. Ventral spongiform lobe of postpetiole fractionally larger than the lateral lobe. Basigastral costulae sharply defined. Petiole, postpetiole and gaster dorsally with stout standing hairs which are swollen to feebly clavate apically. Colour usually with head and alitrunk medium brown, the gaster darker brown, but uniformly dark individuals also occur.

In Brown's (1954) study of the African *Strumigenys* he synonymized two names, *petiolata* and *faurei*, under *rufobrunnea*. Since then a considerable amount of material has been amassed and it now appears that each of these names represents a separate species, not for the reasons put forward by their original authors but based upon characters which have only become apparent as the number of samples available for study has increased. The bulk of the material referred by Brown to *rufobrunnea* belongs in fact to *petiolata*, quickly separable as it lacks flagellate hairs at the pronotal humeri. The remainder is split between the genuine West African *rufobrunnea* and the South African *faurei*, known at present only from Natal, both of which possess humeral flagellate hairs. Characters separating these two are given under *faurei*.

MATERIAL EXAMINED

Guinea: Conakry (*F. Silvestri*). **Ivory Coast:** Lamto (*W. H. Gotwald*); Man (*V. Mahnert & J.-L. Perret*); Adiopodoume (*V. Mahnert & J.-L. Perret*). **Ghana:** Legon (*D. Leston*); Mampong (*P. Room*). **Togo:** Palimé, Kpime Forest (*Vit*). **Nigeria:** Gambari (*B. Taylor*).

Strumigenys rukha sp. n.

HOLOTYPE WORKER. TL 2.4, HL 0.60, HW 0.45, CI 75, ML 0.28, MI 47, SL 0.33, SI 73, PW 0.29, AL 0.58.

Mandibular blades with their outer margins shallowly convex, feebly bowed outwards in full-face view. Mandibular apices each with a fork of 2 teeth, without intercalary teeth or denticles. Each blade with preapical armament of 2 teeth, the proximal the longest. Distal preapical tooth of left mandible longer than the distance separating its base from that of the proximal preapical tooth. Upper scrobe margins evenly divergent posteriorly, the eyes visible in full-face view. Maximum diameter of eye about equal to or very slightly greater than the maximum width of the scape, the eye with 14–15 ommatidia. Preocular notch present but vestigial, represented only by an inconspicuous shallow indentation of the ventrolateral margin immediately in front of the eye; the preocular notch not continued onto the ventral surface of the head as a transverse groove or impression. Antennal scapes very shallowly curved in the basal third, the median third expanded to about twice the basal width. Leading edges of scapes equipped with an apically curved row of slender spatulate hairs which are smaller than the projecting hairs fringing the upper scrobe margins. Ground-pilosity of cephalic dorsum of inconspicuous short flattened to spatulate curved hairs, the upper scrobe margins fringed by an anteriorly curved row of much larger hairs which are spatulate to narrowly spoon-shaped. Dorsum of head with 6 standing hairs arranged in a transverse row of 4 close to the occipital margin and a more anteriorly situated pair. Cephalic dorsum reticulate-punctate. Pronotal humeri each with a fine flagellate hair. Mesonotum with a single pair of stout standing hairs. Ground-pilosity of dorsal alitrunk of sparse inconspicuous hairs similar to those on the head. Posterior portion of mesonotum depressed behind the level of the pair of hairs. Metanotal groove represented by a feebly marked line across the dorsum, not impressed. Propodeal teeth short and broadly triangular, subtended by a broad infradental lamella on each side which is confluent with the tooth for half or more of its length. Sides of alitrunk mostly smooth, the pronotal sides with vestigial superficial reticulate markings and the pleurae with faint peripheral punctures. Pronotal dorsum longitudinally finely costulate-rugulose, the remainder of the dorsal alitrunk punctate. Petiole node punctate dorsally, the postpetiole smooth and shining. Spongiform appendages of pedicel segments well developed, the petiole ventrally with a broad spongiform strip which follows a basal low broad translucent triangular lobe. Ventral spongiform lobe of postpetiole larger than the lateral lobe and larger than the exposed area of the postpetiolar disc in profile. Petiole node in dorsal view transversely rectangular, with a posterior transverse lamella. Postpetiole surrounded on all sides with spongiform material, the lateral and ventral lobes projecting beyond the outline of the disc and visible in dorsal view. First gastral tergite with a narrow basal strip from which the sharply defined basigastral costulae arise. Petiole, postpetiole and gaster dorsally with standing stout hairs. Colour yellow.

PARATYPE WORKERS. TL 2.3–2.4, HL 0.57–0.60, HW 0.44–0.46, CI 75–79, ML 0.27–0.28, MI 47–49, SL 0.30–0.33, SI 67–73, PW 0.28–0.30, AL 0.56–0.60 (10 measured).

As holotype but in some the mesonotum with a shallow transverse impression at the base of the descending portion of the sclerite. The translucent lobe at the base of the petiole ventrally is very variable in shape and size. In most workers it is a triangular to rounded lobe but in some is much reduced and rarely it may be absent. The preocular notch, weakly developed at best, may be undetectable.

Holotype worker, **Kenya:** Embu, Kirimiri Forest, W. of Runyenje, 1550 m, 3.x.1977 (V. Mahnert & J.-L. Perret) (MHN).

Paratypes. 42 workers and 2 females with same data as holotype (MHN; BMNH; MCZ; ENSA).

Non-paratypic material examined. **Kenya:** Embu, Kirimiri Forest (V. Mahnert & J.-L. Perret). **Uganda:** Ft. Portal (N. A. Weber).

S. rukha is most closely related to *adrasora*, *relahyla*, and *dyshaula*. It is easily separated from the first of these as in *adrasora* the spongiform appendages of the pedicel segments are small, the ventral postpetiolar lobe being smaller than the exposed portion of the postpetiolar disc in profile. In *rukha* the spongiform appendages are better developed than in *dyshaula* and *relahyla*, but in *dyshaula* the distal preapical tooth of the left mandible is much more slender than the proximal and only about half of its length, whereas in *rukha* the distal preapical tooth of the left mandible is only marginally narrower than the proximal and is three-quarters or more of its length. In *relahyla* the mandibles are slightly shorter (MI 43–46) and stouter than in *rukha* (MI 47–49) and the preocular notch is much more strongly impressed.

Strumigenys sarissa sp. n.

(Fig. 50)

HOLOTYPE WORKER. TL 2.9, HL 0.72, HW 0.52, CI 72, ML 0.38, MI 53, SL 0.46, SI 88, PW 0.33, AL 0.74.

Apical fork of each mandible of 2 spiniform teeth, the fork of the left mandible with an intercalary small

tooth between the upper and lower spiniform teeth; right apical fork without an intercalary tooth. Blade of left mandible with a single preapical tooth, the proximal; right mandibular blade with 2 preapical teeth, a spiniform proximal (which is equal in size to that on the left blade) and a much smaller distal preapical tooth which is situated very close to the apical fork and is hidden from view by the right dorsal fork tooth when the mandibles are closed. Upper scrobe margins irregular in full-face view, not fringed by a lamina throughout their length. Behind the convex frontal lobes the upper scrobe margins are sharply concave and have a pinched-in appearance. Posterior to this the upper scrobe margins expand and diverge, are shallowly concave above the eyes so that the latter are clearly visible, and diverge more strongly behind this. Preocular notch deep and strongly developed, the anterior portion of the eye detached from the side of the head. Preocular notch continued onto ventral surface of head as a shallow but broad impression. Antennal scapes elongate and narrow, subcylindrical and with all the hairs on the leading edges directed apically. Ground-pilosity of head everywhere of fairly dense narrowly spatulate hairs which are curved anteriorly, the hairs fringing the upper scrobe margins not noticeably larger than those elsewhere on the vertex. In profile the vertex lacking larger prominent hairs which project above the ground-pilosity. Entire cephalic dorsum finely punctate. Pronotal humeri each with a long fine flagellate hair and the curved anterior margin of the pronotum between the flagellate hairs with a pair of shorter but stouter erect simple curved hairs. Mesonotum with a pair of strong standing hairs, the dorsal alitrunk otherwise without standing pilosity except that in a few paratypes a second pair of simple erect hairs may occur on the pronotum. Ground-pilosity of dorsal alitrunk of sparse curved narrow hairs which are closely applied to the surface. In profile the pronotum and anterior mesonotum high and convex, the posterior mesonotum and propodeum depressed. Metanotal groove not impressed. Propodeum with a pair of triangular teeth which are subtended by narrow infradental lamellae. Sides of alitrunk feebly punctate peripherally, the main area of the pleurae smooth. Dorsal alitrunk punctate everywhere. Dorsum of petiole punctate, the postpetiole showing vestigial punctate sculpture. Petiole in profile without a ventral spongiform appendage, with a narrow posterior collar on the node. Postpetiole with a moderate ventral spongiform lobe and a smaller lateral lobe. In dorsal view the postpetiole with a narrow posterior spongiform strip. Base of first gastral tergite with a narrow transverse strip, with numerous fine basal costulae. Petiole, postpetiole and gaster dorsally with strong standing pilosity which is clavate apically. Colour light brown.

PARATYPE WORKERS. TL 2.9–3.2, HL 0.72–0.82, HW 0.50–0.60, CI 68–75, ML 0.38–0.44, MI 53–55, SL 0.46–0.52, SI 83–92, PW 0.30–0.38, AL 0.74–0.80 (15 measured).

As holotype but some with a second pair of simple hairs on the pronotum which are sited beside the flagellate hairs. Postpetiolar sculpture may be intense so that the disc is as strongly punctate as the petiole, and the basigastral costulae may be more strongly defined. The petiole ventrally usually lacks a spongiform appendage but in some a very narrow strip may be present.

Holotype worker, **Burundi**: Bujumbura, no. 82, 1977 (*A. Dejean*) (BMNH).

Paratypes. **Burundi**: 1 worker with same data as holotype; 2 workers with same data but no. 86. **Rwanda**: 17 workers and 1 female, Kayove, 2100 m, 15.v.1973 (*P. Werner*); 4 workers with same data but 25.v.1973; 2 workers with same data but 23.iv.1973; 2 workers, Kamiranzovu, 1900 m, i.1976 (*P. Werner*) (BMNH; MHN; MCZ; ENSA).

Non-paratype material examined. **Zaire**: Lwiro (*P. J. Curtis*).

In the Afrotropical region the characteristic apical and preapical dentition where an intercalary tooth is present in the left apical fork but not in the right, and the left blade has one preapical tooth but the right blade has two, is restricted to the two species *sarissa* and *londianesis*. Details for separating them are tabulated under the latter name.

Strumigenys scotti Forel

(Fig. 75).

Strumigenys scotti Forel, 1912: 159. Syntype workers, SEYCHELLE IS: Silhouette, Mare aux Cochons, 1000 ft (305 m), 1905 (*H. Scott*) (BMNH; MHN) [examined].

Strumigenys scotti Forel; Brown, 1954: 23.

WORKER. TL 2.4–2.6, HL 0.62–0.70, HW 0.42–0.46, CI 64–70, ML 0.30–0.33, MI 46–50, SL 0.39–0.42, SI 88–95, PW 0.26–0.29, AL 0.60–0.66 (8 measured).

Mandibles in full-face view with the outer margins shallowly and evenly convex, the width of the blade approximately constant from the level of the proximal preapical tooth to near the base where the mandibles are somewhat narrowed. Apical fork of each mandible of 2 stout teeth, without intercalary teeth or

denticles. Each mandible with 2 stout preapical teeth which are situated in the apical third of the length of the blade. The proximal preapical teeth slightly longer than the distal, the distals longer than the distance separating the bases of the preapical teeth. Upper scrobe margins evenly and shallowly convex, rounding cleanly into the sides of the occipital lobes without trace of an angle, the two together forming a single evenly curved surface in full-face view. Upper scrobe margins not bounded by a rim or flange, the eyes clearly visible in full-face view. Eyes large, with about 20 ommatidia, the maximum diameter of the eye distinctly greater than the maximum width of the scape. Preocular notch absent, the ventral surface of the head without a transverse preocular groove or impression. Antennal scapes long slender and subcylindrical, only very feebly curved near the base and with their leading edges equipped with a row of slender small hairs which curve towards the apex and which are slightly flattened or spoon-shaped apically. Cephalic dorsum densely clothed with curved narrow spatulate to spoon-shaped ground-pilosity, the upper scrobe margins fringed with a dense row of hairs which are the same shape and size as those on the dorsum. Cephalic dorsum with 6 simple standing hairs arranged in a transverse row of 4 close to the occipital margin and a more anteriorly situated pair. Pronotal humeri each with a single long fine flagellate hair. Mesonotum with a single pair of standing hairs. Ground-pilosity on alitrunk as on head but the hairs smaller and sparser. Posterior portion of mesonotum shallowly depressed behind the level of the standing hairs. Propodeal teeth triangular and subtended by narrow infradental lamellae. Sides of alitrunk superficially punctulate peripherally, the pleurae mostly smooth. Pronotal dorsum longitudinally feebly rugulose and punctate. Remainder of dorsal alitrunk reticulate-punctate. Petiole node in dorsal view reticulate-punctate and at least as long as broad, often longer than broad. Postpetiole smooth and shining. Spongiform appendages of pedicel segments well developed, the petiole with a ventral strip and conspicuous lateral lobe on the node. Postpetiole with large lateral and ventral spongiform lobes of which the ventral is the larger, about as large as the exposed area of the postpetiolar disc in profile. In dorsal view the spongiform material not or only very slightly projecting beyond the lateral outline of the disc. Basigastral costulae arising on each side of a central clear area. Dorsal surfaces of petiole, postpetiole and gaster with standing hairs which are simple or very slightly thickened apically. Colour yellowish brown to medium brown.

The affinities and differentiation of *scotti* are discussed under *hastyla*, a closely related species.

S. scotti is still only known from a couple of collections, one made in the Seychelles and the other on São Tomé island. This implies that *scotti* is most probably an Afrotropical species of limited tramping ability, but to date no samples have been found on the continental mainland.

MATERIAL EXAMINED

Seychelles: Silhouette I. (*H. Scott*). **São Tomé & Príncipe:** São Tomé I., Mkambrera (*B. Malkin*).

Strumigenys shaula sp. n.

HOLOTYPE WORKER. TL 2.2, HL 0.57, HW 0.44, CI 77, ML 0.25, MI 44, SL 0.29, SI 66, PW 0.28, AL 0.56.

Mandibles in full-face view weakly bowed outwards. Apical fork of each mandible with 2 teeth, without intercalary teeth or denticles. Preapical armament of 2 teeth on each mandibular blade, both situated close to the apex, the proximal longer than the distal in each case. Space separating the proximal and distal preapical teeth distinctly shorter than the length of the distal tooth. Upper scrobe margins bordered by a narrow rim or flange throughout their length, evenly divergent posteriorly and approximately straight rather than sinuate. Eyes relatively large, plainly visible in full-face view, the maximum diameter of the eye $0.18 \times HW$, and in full-face view the length of the eye distinctly much greater than the maximum width of the scape. Preocular notch present and conspicuous, the anteriormost portion of the eye detached from the side of the head. Preocular notch continued onto ventral surface of head as a deep transverse groove which is narrower than the maximum diameter of the eye and has approximately parallel quite sharply defined margins. Antennal scapes feebly bent in the basal third and slightly thickened medially, the leading edges with a row of apically curved spoon-shaped hairs. Ground-pilosity of cephalic dorsum of inconspicuous small curved hairs, the upper scrobe margins fringed by a row of much larger spoon-shaped hairs which are curved anteriorly. Dorsum of head with 6 standing hairs arranged in a transverse row of 4 close to the occipital margin and a more anteriorly situated pair. Cephalic dorsum shallowly reticulate-punctate. Pronotal humeri each with a single fine flagellate hair, the mesonotum with a single pair of standing hairs. Ground-pilosity of dorsal alitrunk of minute hairs which are closely applied to the surface. With the alitrunk in profile the posterior portion of the mesonotum only very feebly depressed behind the level of the hairs, the metanotal groove weakly impressed. Propodeal teeth subtended by infradental lamellae which are about half as wide as the length of the tooth. Sides of propodeum superficially punctate, the pleurae mostly smooth except for some peripheral fine punctures which are best developed laterodorsally. Sides of pronotum with traces of punctate sculpture anteriorly and dorsally. Pronotal dorsum finely

longitudinally rugulose, the spaces between the rugulae inconspicuously punctulate. Remainder of dorsal alitrunk reticulate-punctate. Dorsum of petiole node narrow from front to back and very broad, finely punctate; the postpetiole smooth. Spongiform appendages of pedicel segments moderately developed, the subpetiolar process narrower than the depth of the peduncle at its midlength. Ventral and lateral spongiform lobes of postpetiole well developed, the former only marginally larger than the latter and about equal in size to the exposed area of the postpetiolar disc in profile. In dorsal view the postpetiole with a narrow laminar posterior transverse strip; on the sides projecting spongiform material restricted to the posterior halves. Base of first gastral tergite with a laminar transverse strip from which the sharply defined basigastral costulae arise. Petiole, postpetiole and gaster dorsally with stout standing hairs which are thickened to feebly clavate apically. Colour yellowish brown to light brown.

PARATYPE WORKERS. TL 2.1–2.3, HL 0.54–0.58, HW 0.42–0.47, CI 75–81, ML 0.25–0.27, MI 44–47, SL 0.27–0.31, SI 64–69, PW 0.27–0.31, AL 0.52–0.58 (3 measured). As holotype.

Holotype worker, **Zimbabwe**: Gwebi, 1971, acc. 14746, pitfall trap (*K. J. Wilson*) (BMNH).

Paratypes. 3 workers with same data as holotype (BMNH; MCZ).

The closest relative of *shaula* appears to be *pretoriae*, but in that species the eyes are very large, the head has uniform scale-like pilosity and the pronotal humeri lack flagellate hairs. In the closely related *dromoshaula* from Burundi the extension of the preocular notch onto the ventral surface of the head forms a broad shallow dish-like impression with feebly defined rounded margins, rather than the narrow groove with sharp edges seen in *shaula*. In *dyshaula* the preocular notch is reduced, small and shallow in full-face view and not extended onto the ventral surface of the head. *S. shaula* also shows some relationship with the West African *rufobrunea* but the latter species is smaller, has longer scapes, smaller eyes, more sinuate upper scrobe margins and a petiole node which in dorsal view is only marginally broader than long, as well as the dental character given in the key

Strumigenys spathoda sp. n.

(Fig. 62)

HOLOTYPE WORKER. TL 2.1, HL 0.55, HW 0.44, CI 80, ML 0.16, MI 29, SL 0.27, SI 61, PW 0.27, AL 0.56.

Mandibles very short, stout and powerfully constructed, their outer margins convex. Apical fork of each mandible with 2 spiniform teeth, the upper of which is very long, its length distinctly greater than $0.5 \times \text{ML}$; apical forks without intercalary teeth or denticles. Each mandible with 2 preapical teeth, the proximal by far the longest (just less than $0.5 \times \text{ML}$) and situated at or just distal of the midlength of the blade. Distal preapical tooth less than half the length of the proximal. Upper scrobe margins bordered by a narrow rim or flange whose free margins are irregular, the eyes not visible in full-face view. Eyes very small, their maximum diameter conspicuously very much less than the maximum width of the scape. Preocular notch absent, the ventral surface of the head without a preocular transverse groove or impression on each side. Antennal scapes flattened and expanded, the leading edge broadly convex and prominent, equipped with a row of large spoon-shaped hairs which are about equal in size to those bordering the upper scrobe margins. Dorsum of head from the posterior clypeal margin to about the midlength densely clothed with broad anteriorly curved spoon-shaped hairs which appear scale-like in full-face view. Hairs of the same shape and size fringe the upper scrobe margins. Behind the midlength of the head the hairs are distinctly much smaller and narrow, and contrast strongly with those on the anterior half. Dorsum of head with a transverse row of 4 short stout standing hairs close to the occipital margin, without a more anteriorly situated pair. Cephalic dorsum reticulate-punctate to granular. Pronotal humeri each with a fine flagellate hair (apparently easily lost by abrasion in this species). Mesonotum with a single pair of standing hairs. Ground-pilosity of dorsal alitrunk consisting of sparse small hairs similar to those on the posterior half of the head. Metanotal groove represented by a short line on the dorsum, very feebly impressed in profile. Mesonotum not sharply depressed behind the level of the pair of hairs, instead its surface forming a fairly even slope. Propodeal teeth triangular and subtended by broad infradental lamellae. Sides of pronotum superficially sculptured, the pleurae and sides of propodeum mostly smooth, with some faint peripheral punctation. Pronotal dorsum sparsely longitudinally rugulose, the remainder of the dorsal alitrunk reticulate-punctate. Dorsum of petiole node punctate, the postpetiole smooth (when clean, in the holotype the surface is obscured by a thin layer of wax or dirt). Spongiform appendages of pedicel segments well developed. Petiole with a broad ventral strip which at its broadest is equal to the depth of the peduncle. Ventral and lateral spongiform lobes of postpetiole subequal, the former marginally larger and about the same size as the exposed area of

the postpetiolar disc in profile. Basigastral costulae short but quite sharply defined. Dorsal surfaces of petiole, postpetiole and gaster with stout standing hairs which are thickened to clavate apically. Colour medium brown.

PARATYPE WORKERS. TL 2.0–2.1, HL 0.53–0.55, HW 0.41–0.44, CI 77–81, ML 0.14–0.16, MI 26–30, SL 0.24–0.26, SI 55–61, PW 0.25–0.28, AL 0.48–0.56 (5 measured).

As holotype. All members of the type-series are covered to some extent by a thin layer of dirt or a waxy deposit which obscures some features. In particular the sculpture of the dorsal body is difficult to discern and the layer tends to obscure the pilosity.

Holotype worker, **Togo**: Palimé, Klouto Forest, 20–25.iv.1974 (Vit) (MHN).

Paratypes. 5 workers with same data as holotype (MHN; BMNH; MCZ).

Non-paratypic material examined. **Ivory Coast**: Man (V. Mahnert & J.-L. Perret). **Cameroun**: nr Yaounde (G. Terron).

This distinctive species has the shortest mandibles yet recorded for a member of *Strumigenys* in the Afrotropical region. It is related to *tetraphanes* but does not possess the massively lobate expansions of the anterior scape margins seen in that species and has pronotal flagellate hairs present.

Strumigenys stygia Santschi

Strumigenys stygia Santschi, 1913a: 257 (diagnosis in key). Syntype workers, KENYA: Cave A at Shimoni, st. no. 9, xi.1911 (*Alluaud & Jeannel*) (NMB) [examined].

Strumigenys stygia Santschi; Santschi, 1914a: 113, fig. 20 (description).

Strumigenys stygia Santschi; Brown, 1954: 29.

WORKER. TL 1.9–2.1, HL 0.50–0.53, HW 0.40–0.43, CI 80–84, ML 0.18–0.21, MI 36–40, SL 0.26–0.28, SI 63–68, PW 0.24–0.25, AL 0.48–0.52 (7 measured).

Apical fork of each mandible with 2 teeth, without intercalary teeth or denticles. Each mandibular blade with 2 preapical teeth, the proximal longer than the distal in each case. Upper scrobe margins convex, the eyes not visible in full-face view. Eyes small, the maximum diameter distinctly less than the maximum width of the scape. Preocular notch absent, ventral surface of head without a transverse preocular groove or impression. Antennal scapes curved in the basal third, the median third expanded and somewhat flattened, the convex leading edges of the scapes with a row of apically curved short broadly spoon-shaped hairs. Ground-pilosity of head relatively broad spoon-shaped hairs which are curved anteriorly and appear stud-like or scale-like in full-face view, the hairs on the dorsum anterior to the highest point of the vertex somewhat larger and more conspicuous than those posterior to this point. Hairs fringing the upper scrobe margins the same shape as those on the dorsum. Cephalic dorsum reticulate-punctate. Pronotal humeri each with a single fine flagellate hair. Mesonotum with a single pair of clavate standing hairs. Ground-pilosity of dorsal alitrunk of sparse spoon-shaped to scale-like small hairs. Mesonotum depressed behind the level of the pair of hairs. Metanotal groove represented on the dorsum by a faint line. Sides of pronotum superficially reticulate or granular, pleurae and propodeum laterally smooth except for some weak patches of punctate sculpture peripherally. Pronotal dorsum densely punctate, usually with overlying weak longitudinal rugulae. Remainder of dorsal alitrunk reticulate-punctate. Dorsum of petiole node reticulate-punctate, postpetiole superficially granular to reticulate-punctate. Ventral spongiform strip of petiole narrow and inconspicuous. Ventral spongiform lobe of postpetiole equal to or slightly less than the exposed area of the postpetiole. Basigastral costulae conspicuous. Dorsal surfaces of petiole, postpetiole and gaster with stout standing hairs which are thickened or clavate apically. Colour light brown to medium brown.

S. stygia belongs to the core-species of the *arnoldi*-complex, which also includes *arnoldi*, *traegaardhi*, *mesahyla* and *nimbrata*. These four are separated from *stygia* as *arnoldi* lacks pronotal flagellate hairs, *nimbrata* has funicular segments 2 and 3 vestigial, and both *mesahyla* and *traegaardhi* do not have the postpetiole sculptured.

MATERIAL EXAMINED

Kenya: Shimoni (*Alluaud & Jeannel*). **Zimbabwe**: Umtali, Melssetter (R. Mussard). **Cameroun**: nr Yaounde (G. Terron). **Angola**: Bruco (P. Hammond).

Strumigenys tetraphanes Brown

(Fig. 60)

Strumigenys tetraphanes Brown, 1954: 30. Holotype worker, UGANDA: 5 miles (8 km) N. of Kampala, Kawanda Exp. St., 15.ii.1949, soil sample under elephant grass (*G. Salt*) (MCZ) [examined].

WORKER. TL 2.0–2.2, HL 0.54–0.60, HW 0.51–0.57, CI 91–97, ML 0.19–0.22, MI 34–37, SL 0.28–0.30, SI 52–55, PW 0.30–0.32, AL 0.50–0.58 (4 measured).

Mandibular apices each with a fork of 2 spiniform teeth, without intercalary teeth or denticles, the upper tooth of the apical fork very long, more than $0.5 \times \text{ML}$. Preapical armament of each blade of 2 teeth, the proximal long and strongly spiniform, 2–3 times longer than the small distal preapical tooth. Upper scrobe margins sharply divergent behind, the head broad behind the midlength and almost as broad as long. Eyes not visible in full-face view, small, conspicuously much smaller than the maximum width of the scape. Preocular notch absent, the ventral surface of the head without a transverse preocular groove or impression. Antennal scapes flattened and enormously expanded anteriorly into a large lobe which about equals the clypeus in area. Leading edges of scapes with a row of broad shallowly spoon-shaped hairs. Dorsum of head from posterior clypeal margin to about the midlength densely clothed with very broad shallowly spoon-shaped hairs which appear scale-like to suborbicular in full-face view; such hairs also fringe the upper scrobe margins. Behind the midlength the cephalic ground-pilosity is much smaller, about the same as on the clypeus; the difference in size between these hairs and the broad scale-like hairs is striking. Dorsum of head with a transverse row of 4 longer narrowly clavate hairs close to the occipital margin, without a pair situated close to the highest point of the vertex. Head densely reticulate-punctate. Pronotal humeri lacking flagellate or any other kind of projecting hair. Mesonotum with a single pair of strongly clavate hairs. Ground-pilosity of dorsal alitrunk of small flattened hairs which are almost appressed. With the alitrunk in profile the sides of the pronotum thickly and bluntly marginate. Anterior portion of mesonotum shallowly convex, the posterior portion depressed behind the level of the clavate hairs and shallowly transversely impressed. Propodeal teeth subtended by broad infradental lamellae. Sides of pronotum reticulate-punctate, the pleurae and sides of the propodeum mostly smooth, with punctures peripherally. Dorsal alitrunk, petiole and postpetiole reticulate-punctate. Spongiform appendages of pedicel segments well developed. In profile the petiole with a straight narrow ventral strip; ventral spongiform lobe of postpetiole equal to or slightly smaller than the exposed area of the postpetiolar disc in profile, equalling or slightly larger than the lateral lobe. Basigastral costulae sharply developed but short. Petiole, postpetiole and gaster dorsally with stout hairs which are swollen or clavate apically. Colour brown.

The enormously expanded antennal scapes make *tetraphanes* one of the most easily recognized Afrotropical *Strumigenys* and this character, coupled with the form of the mandibles, pilosity, head width and sculpture, should make confusion of *tetraphanes* with any other species impossible.

MATERIAL EXAMINED

Uganda: Kampala, Kawanda Exp. Sta. (*G. Salt*). Cameroun: Nkoemvon (*D. Jackson*); nr Yaounde (*G. Terron*). Gabon: Plateau d'Ipassa (*J. A. Barra*).

Strumigenys totyla sp. n.

(Fig. 56)

HOLOTYPE WORKER. TL 2.3, HL 0.64, HW 0.45, CI 70, ML 0.28, MI 44, SL 0.34, SI 76, PW 0.29, AL 0.58.

Apical fork of each mandible with 2 spiniform teeth, without intercalary teeth or denticles. Preapical armament of each mandible of 2 stout teeth, the distal tooth about $0.75 \times$ the length of the proximal. Outer margins of mandibles shallowly convex in full-face view. Upper scrobe margins bordered by a conspicuous laminar rim or flange throughout their length, the eyes visible in full-face view. Maximum diameter of eye about $0.17 \times \text{HW}$, the maximum diameter of the eye distinctly greater than the maximum width of the scape. Preocular notch present and distinct on the ventrolateral cephalic margin but the anterior portion of the eye not detached from the side of the head. Preocular notch ending at the ventrolateral margin, not extending across the ventral surface as a groove or impression. Antennal scapes slightly bent in the basal third, broadest at about the midlength and the leading edges equipped with a row of apically curved narrowly spoon-shaped hairs which are only slightly smaller than those fringing the upper scrobe margins. With the head in full-face view the sides behind the apices of the scrobe margins approximately straight and convergent posteriorly. Ground-pilosity of head consisting of inconspicuous small spatulate to narrowly

spoon-shaped hairs. Upper scrobe margins with a row of anteriorly curved large spoon-shaped hairs. Dorsum of head with an occipital transverse row of 4 stout standing hairs, without a pair situated anterior to this row (it is possible that an anterior pair should be present but has been lost by abrasion in the holotype). Head finely reticulate-punctate everywhere. Pronotal humeri without flagellate hairs. Mesonotum with a single pair of stout standing hairs. Metanotal groove represented by a transverse line on the dorsum. In profile the posterior portion of the mesonotum depressed behind the level of the standing hairs. Propodeal teeth small, almost completely merged with the infradental lamellae and only with their extreme apices projecting. Sides of pronotum finely superficially punctate, the pleurae mostly smooth but with peripheral punctures; sides of propodeum finely punctate. Pronotal dorsum punctate and with irregular rugulae formed by alignment of the punctures, postero-central portion with some longitudinal costulae. Remainder of dorsal alitrunk and dorsum of petiole node reticulate-punctate, the postpetiole with some scratch-like faint striae towards the sides of the disc but smooth medially. Spongiform appendages of pedicel segments moderately developed, the petiole with a narrow ventral strip. Ventral spongiform lobe of postpetiole slightly larger than the exposed area of the disc in profile. In dorsal view the postpetiole is bounded by narrow spongiform strips both in front and behind, but spongiform material does not freely project beyond the outline of the sides except posterolaterally. First gastral tergite with a lamellate basal strip, the basigastral costulae short and radiating from the basal strip on each side of a clear central area. Dorsal surfaces of petiole, postpetiole and gaster with standing stout hairs. Colour yellow.

Holotype worker, **Cameroun**: nr Yaounde, sample no. 1784 (*G. Terron*) (ENSA).

Known only from the holotype, *totyla* belongs to that section of the *faurei*-complex in which the preocular notch is present but does not extend ventrally as an impression across the ventral surface of the head. Among the six species falling into this category (*relahyla*, *dyshaula*, *xenohyla*, *totyla*, *adrasora*, *rukha*) the *totyla* holotype is easily recognized by its lack of pronotal flagellate hairs and presence of only 4 standing hairs on the cephalic dorsum. In all the others flagellate hairs are present on the pronotum and the cephalic dorsum has 6 standing hairs. Unfortunately the universality of these characters among the closest relatives of *totyla* makes me suspect that perhaps the hairs have been abraded away.

Strumigenys traegaordhi Santschi

Strumigenys traegaordhi Santschi, 1913a: 257 (diagnosis in key). Syntype workers, SOUTH AFRICA: Natal, Pietermaritzburg (*J. Trägårdh*) (NMB) [examined].

Strumigenys traegaordhi Santschi; Santschi, 1914c: 28, fig. 4 (description).

Strumigenys traegaordhi Santschi; Brown, 1954: 26.

WORKER. TL 2.0–2.1, HL 0.54–0.55, HW 0.43, CI 78–80, ML 0.24, MI 44, SL 0.30, SI 70, PW 0.28, AL 0.59–0.60 (2 measured).

Apical fork of each mandible with 2 teeth, without intercalary teeth or denticles. Preapical armament of each blade of 2 teeth, the proximal distinctly longer than the distal and both teeth situated in the apical third of the length of the blade. Upper scrobe margins bordered by a narrow rim, the eyes not visible in full-face view. Eyes small, their maximum diameter distinctly less than the maximum width of the scape. Preocular notch absent, the ventral surface of the head without a preocular transverse groove or impression on each side. Antennal scapes shallowly curved in the basal third and slightly expanded in the median third, broadest at about the midlength. Leading edges of scapes shallowly convex and with a row of apically curved narrowly spoon-shaped hairs. Dorsum of head with ground-pilosity which becomes narrower and finer from front to back. Anteriorly, from the level of the posterior clypeal margin to about the level of the ends of the preocular laminae the hairs are spoon-shaped and quite broad, appearing almost scale-like in full-face view. Behind this level, and posteriorly over the highest point of the vertex to the occipital margin, the hairs are much narrower and less conspicuous, narrowly spatulate in shape. Hairs fringing the upper scrobe margins spoon-shaped and as large as those on the anterior portion of the cephalic dorsum. In profile the dorsum of the head with 6 standing hairs arranged in a row of 4 close to the occipital margin and a more anteriorly situated pair which are about at the highest point of the vertex. Dorsum of head reticulate-punctate. Pronotal humeri each with an elongate fine flagellate hair, the mesonotum with two pairs of standing hairs, the posterior pair of which is only half as long as the anterior pair. Ground-pilosity of dorsal alitrunk of sparse narrowly spatulate hairs similar to those on the head behind the highest point of the vertex. Metanotal groove present as a feeble line across the dorsum. Apical portions of propodeal teeth, which are free from the narrow infradental lamellae, very narrowly triangular and almost spiniform. Sides of alitrunk mostly smooth, the pleurae and sides of the propodeum with some peripheral punctures.

Dorsal alitrunk reticulate-punctate, the pronotum also with some weak longitudinal rugulae. Dorsum of petiole node reticulate-punctate, the postpetiole smooth or at most with a few feeble punctures posteriorly. Spongiform appendages of pedicel segments moderately developed. In profile the petiole with a narrow ventral strip and a small lateral lobe, the postpetiole with the ventral lobe slightly smaller than the exposed area of the postpetiolar disc in profile. Basigastral costulae short but quite strongly defined. Petiole, postpetiole and gaster with standing stout hairs which are swollen or feebly clavate apically. Colour brown.

The closest relative of *traegaordhi* is *mesahyla*, known from Zimbabwe. The two are superficially very similar but differ as follows.

<i>traegaordhi</i>	<i>mesahyla</i>
Dorsum of head with 6 standing hairs, the hairs slender.	Dorsum of head with 4 standing hairs, the hairs thick.
Hairs of cephalic ground-pilosity much narrower posteriorly than anteriorly.	Hairs of cephalic ground-pilosity the same everywhere on the head.
Mesonotum with 2 pairs of stout standing hairs.	Mesonotum with a single pair of stout standing hairs.
Reticulate-punctate sculpture predominant on pronotum.	Longitudinal rugular sculpture predominant on pronotum.
Ventral spongiform lobe slightly smaller than exposed area of disc in profile.	Ventral spongiform lobe much larger than exposed area of disc in profile.
Basigastral costulae arising across entire width of first tergite.	Basigastral costulae arising on each side of a clear central area on first tergite.

MATERIAL EXAMINED

South Africa: Pietermaritzburg (*I. Trägårdh*).

Strumigenys vazerka sp. n.

(Fig. 52)

HOLOTYPE WORKER. TL 2.2, HL 0.58, HW 0.38, CI 66, ML 0.34, MI 59, SL 0.32, SI 84, PW 0.26, AL 0.54. Mandibles in full-face view long, noticeably divergent from base to apex, and with the outer margins of the blades convex. Apical fork of each mandible with 2 spiniform teeth, without intercalary teeth or denticles. Preapical armament of each mandible of 2 teeth, a long spiniform proximal and a short distal. Upper scrobe margins not bounded by a projecting rim or flange, close together behind the frontal lobes and evenly divergent posteriorly; not concave or impressed above the eyes but still quite close together so that the eyes are clearly visible in full-face view. Preocular notch present, deep and conspicuous, the anterior portion of each eye detached from the side of the head. Preocular notch continued onto ventral surface of head as a broad groove or impression. Maximum diameter of eye greater than the maximum width of the scape. Antennal scapes relatively long, straight and slender, their leading edges with a row of narrowly spatulate hairs which are directed apically. Ground-pilosity of cephalic dorsum inconspicuous, of short narrowly spatulate hairs which are curved anteriorly. Upper scrobe margins bordered by a row of anteriorly curved spoon-shaped hairs which are distinctly much larger than the cephalic ground-pilosity. In profile the dorsum of the head with 6 approximately erect simple hairs which are arranged in a transverse row of 4 close to the occipital margin and a more anteriorly situated pair. Dorsum of head finely and shallowly reticulate-punctate. Pronotal humeri each with a fine flagellate hair. Mesonotum with a single pair of stout erect hairs which are broadened apically; dorsal alitrunk otherwise without standing pilosity; the ground-pilosity of minute sparse hairs which are closely applied to the surface. Posterior portion of mesonotum depressed and on the same level as the propodeum, the metanotal groove represented by a transverse line on the dorsum but not impressed. Propodeum armed with a pair of short triangular teeth which are subtended by a narrow infradental lamella on each side. Sides of alitrunk smooth, unsculptured except for some vestigial punctulation on the posterior propodeum. Pronotal dorsum feebly longitudinally costulate or striate, without punctate sculpture. Anterior portion of mesonotum with vestigial punctures, the depressed posterior portion more strongly punctate. Propodeal dorsum mostly smooth, with a very few vestigial punctures laterally. Petiole node punctate-granular dorsally, the postpetiole with some sparse vestigial longitudinal costulae, most conspicuous towards the sides of the disc. In profile the petiole with a narrow ventral spongiform strip. Lateral and ventral spongiform lobes of postpetiole moderately developed. In dorsal view the postpetiole with a transverse narrow spongiform strip posteriorly and the first gastral tergite with a similar but even narrower strip anteriorly. Basigastral costulae sharply defined.

Petiole, postpetiole and gaster with stout standing hairs which are weakly clavate apically. Colour dull yellowish brown.

PARATYPE WORKERS. TL 1.9–2.2, HL 0.52–0.60, HW 0.36–0.40, CI 65–70, ML 0.28–0.34, MI 50–59, SL 0.29–0.34, SI 79–86, PW 0.22–0.28, AL 0.46–0.54 (15 measured).

As holotype but sculpture of alitrunk showing some variation. Sides usually smooth but in some peripheral faint punctulae are present. Dorsum of pronotum usually as holotype but in some the costulae are more pronounced and quite strong, and in others there is a faint punctulate component visible between the costulae. Anterior portion of mesonotum sometimes as distinctly punctate as the depressed posterior portion. Propodeal dorsum usually smooth but often with fine faint lateral or peripheral punctulae, but never punctulate all over the surface.

Holotype worker, **Ivory Coast**: Man, Mt Tonkoui, 900 m, 13.x.1980 (V. Mahnert & J.-L. Perret) (MHN).

Paratypes. **Ivory Coast**: 11 workers with same data as holotype; 22 workers and 2 females, Tai Forest, 17.x.1980 (V. Mahnert & J.-L. Perret) (MHN; BMNH; MCZ; ENSA).

Non-paratypic material examined. **Ivory Coast**: Divo (L. Brader); Abidjan, Banco Forest (W. L. Brown); Banco Nat. Pk. (V. Mahnert & J.-L. Perret); Sassandra (V. Mahnert & J.-L. Perret). **Ghana**: Mt Atewa (D. Leston). **Nigeria**: Gambari (B. Bolton).

The closest relative of *vazerka* is the Central African *bernardi*, but in the latter the left mandibular blade has lost the distal preapical tooth and the propodeal dorsum is reticulate-punctate.

Strumigenys xenohyla sp. n.

(Figs 54, 73)

HOLOTYPE WORKER. TL 2.3, HL 0.60, HW 0.47, CI 78, ML 0.29, MI 48, SL 0.33, SI 70, PW 0.27, AL 0.58.

Apical fork of each mandible with a pair of spiniform teeth, without intercalary teeth or denticles. Preapical armament on each mandibular blade of 2 teeth, both spiniform but the proximal much the longest. Length of the distal preapical tooth more than twice that of the distance separating the bases of the 2 preapical teeth. Upper scrobe margins bordered by a relatively broad conspicuous projecting lamina which has an irregular free margin and which partially conceals the eyes in full-face view. Eyes of moderate size, about 0.15×HW but only fractionally larger than the maximum width of the scape because of the broadening of the latter. Preocular notch present but shallow, the anterior portion of the eye not detached from the side of the head and the notch not extending onto the ventral surface of the head as a transverse groove or impression. Antennal scapes shallowly curved basally, broadened in the middle and slightly dorsoventrally flattened. Leading edges of scapes convex and weakly undulate, the undulate rim forming a narrow flange from which the large spoon-shaped hairs arise; these hairs are about equal in size to those on the upper scrobe margins. Ground-pilosity of cephalic dorsum inconspicuous, of narrow spoon-shaped hairs. Upper scrobe margins with an anteriorly curved row of large spoon-shaped hairs. Cephalic dorsum with 6 standing hairs arranged in a transverse row of 4 close to the occipital margin and an anterior pair close to the highest point of the vertex. Dorsum of head reticulate-punctate. Pronotal humeri each with a long fine flagellate hair. Mesonotum with a single pair of stout standing hairs which are broadly clavate apically. Ground-pilosity of dorsal alitrunk of sparse spatulate to narrowly spoon-shaped hairs which are closely applied to the surface. Mesonotum suddenly and steeply depressed behind the level of the hairs. Metanotal groove represented by a line across the dorsum. Propodeal teeth lamellate and confluent with the broad infradental lamellae for more than half their length. Sides of pronotum with a few faint scratch-like marks. Pleurae and sides of propodeum smooth. Pronotal dorsum finely longitudinally costulate, without punctures. Remainder of dorsal alitrunk almost smooth, with only the vaguest traces of punctulate sculpture present. Dorsum of petiole node granular, the postpetiole smooth. Spongiform appendages of pedicel segments well developed, the petiole with a ventral spongiform strip which is more than half the depth of the peduncle, and with a broadly triangular lateral lobe. Ventral spongiform appendage of postpetiole large, larger than the lateral lobe and distinctly much larger than the exposed area of the postpetiolar disc in profile. In dorsal view the petiole node with a lamellate collar posteriorly. Sides of postpetiole with projecting spongiform tissue visible. Base of first gastral tergite with a lamellar transverse strip from which the sparse basigastral costulae radiate on each side of a central smooth area. Petiole, postpetiole and gaster dorsally with stout standing hairs which are thickened apically. Colour dull yellow.

PARATYPE WORKER. TL 2·3, HL 0·61, HW 0·48, CI 79, ML 0·30, MI 49, SL 0·34, SI 71, PW 0·27, AL 0·58. As holotype.

Holotype worker, **Cameroun**: Nkoemvon, N22, 7.ix.1980 (*D. Jackson*) (BMNH).

Paratype. 1 worker with same data as holotype (BMNH).

Non-paratypic material examined. **Cameroun**: nr Yaounde (*G. Terron*). **Zaire**: Ituri Forest, vic. Epulu (*T. Gregg*).

Measurements of the two non-paratypic specimens show HL 0·64–0·67, HW 0·53, CI 79–83, ML 0·32–0·33, MI 48–51, SL 0·36, SI 68.

Among the species in which the preocular notch is present but not extended as a groove or impression across the ventral surface of the head, *xenohyla* is recognized by its broad flange or rim bordering the upper scrobe margins, flattened scapes, large spoon-shaped hairs on the scapes and upper scrobe margins which are about equal in size, reduced sculpture on the dorsal alitrunk and well-developed spongiform appendages.

Strumigenys zandala sp. n.

(Fig. 66)

HOLOTYPE WORKER. TL 2·3, HL 0·60, HW 0·42, CI 70, ML 0·27, MI 45, SL 0·34, SI 81, PW 0·27, AL 0·60.

Mandibles slender in full-face view, the external margins very shallowly evenly convex and the blades about the same width from the proximal preapical tooth to the base where they are somewhat narrowed and inflected. Apical fork of each blade with 2 teeth, without intercalary teeth or denticles. Each mandibular blade with 2 preapical teeth, the proximal longer and slightly stouter than the distal, both teeth distinctly within the apical third of the length of the blade. Distance separating the bases of the preapical teeth less than the length of the distal tooth. Upper scrobe margins evenly and shallowly convex in full-face view, the eyes visible, the apices of the upper scrobe margins confluent with the sides of the occipital lobes through an even curve, without an angle separating the two. Eyes moderate, with 19–20 ommatidia, the maximum diameter greater than the maximum width of the scape. Preocular notch absent, the ventral surface of the head without a transverse preocular groove or impression. Antennal scapes slender and subcylindrical, curved weakly near the base and with their leading edges equipped with a row of slender flattened hairs which are narrowly spatulate to spoon-shaped and curved towards the apex. Dorsum of head densely clothed with curved narrowly spatulate to slender spoon-shaped ground-pilosity, the upper scrobe margins fringed by a dense row of similar hairs, these hairs slightly larger than those on the scapes. Dorsum of head with 6 standing hairs arranged in a row of 4 close to the occipital margin and a more anteriorly situated pair. Dorsum of head densely reticulate-punctate. Pronotal humeri each with a single fine flagellate hair. Mesonotum with a single pair of simple standing hairs. Ground-pilosity of dorsal alitrunk of narrow curved flattened hairs. Posterior portion of mesonotum shallowly depressed behind the level of the hairs. Metanotal groove feebly impressed. Propodeal teeth triangular and subtended by narrow infradental lamellae. Sides of pronotum superficially punctulate and with some feeble rugulae anteriorly. Upper third to half of mesopleuron, upper third of metapleuron and portion of propodeum above and behind the spiracle densely punctate; lower portions of these segments smooth. Pronotal dorsum very feebly longitudinally rugulose and with punctate sculpture, remainder of dorsal alitrunk and petiole node reticulate-punctate. Postpetiole smooth. Spongiform appendages of pedicel segments well developed, the petiole with a broad ventral strip. Postpetiole with large lateral and ventral lobes, the latter larger than the former and larger than the exposed area of the disc in profile. In dorsal view the petiole node broader than long and the postpetiole surrounded by spongiform tissue, the lateral lobes projecting sideways beyond the outline of the disc. Basigastral costulae fine, arising on each side of a central clear area. Dorsal surfaces of petiole, postpetiole and gaster with simple standing hairs. Colour light brownish yellow.

PARATYPE WORKERS. TL 2·2–2·3, HL 0·59–0·61, HW 0·42–0·44, CI 70–73, ML 0·26–0·27, MI 43–45, SL 0·33–0·35, SI 75–81, PW 0·24–0·30, AL 0·57–0·63 (10 measured). As holotype.

Holotype worker, **Equatorial Guinea**: Annobon I., 400–500 m, v.1902 (*L. Fea*) (MCSN).

Paratypes. 27 workers with same data as holotype (MCSN; BMNH; MCZ).

Non-paratypic material examined. **Cameroun**: nr Yaounde (*G. Terron*).

S. zandala is closely related to *scotti* and *hastyla*. It is separated from the first of these by its shorter mandibles and scapes and by the shape of the petiole node in dorsal view which is broader than long in *zandala* and at least as long as broad (sometimes longer than broad) in

scotti. *S. hastyla* is a smaller species than *zandala* and has the standing hairs on the gaster distinctly swollen or flattened apically in dorsal view. There is a possibility that *hastyla* and *zandala* may represent extremes of a single species but for the present I am treating them as separate species.

QUADRISTRUMA Brown

(Fig. 67)

Quadristruma Brown, 1949b: 47. Type-species: *Epitritus emmae* Emery, 1890: 70, pl. 8, fig. 6, by original designation.

DIAGNOSIS OF WORKER. Afrotropical dacetine ants. Mandibles linear and curved, relatively short (MI 26–32), produced into narrow blades and equipped apically with a strong fork of two long spiniform teeth in a vertical series, the dorsal tooth the longest. Inner margin of each mandibular blade with a long spiniform proximal preapical tooth and a small distal preapical denticle. Antennae with 4 segments. Scape with the leading edge angled but without a subbasal lobe. Head with scale-like to orbicular hairs present. Labral lobes very short and inconspicuous.

This small genus was erected to hold the species *emmae* and *eurycera* (Emery), both of which were originally described in the genus *Epitritus* because of their 4-merous antennae. Brown (1949b) showed that these two species, although seemingly similar to *Epitritus*, were in reality convergently so and had been derived from *Strumigenys* rather than from a *Smithistruma*-like ancestor as is the case with *Epitritus*. With the description of so many new *Strumigenys* and *Epitritus* since 1949 this discovery has been amply confirmed and in fact the differences between *Strumigenys* and *Quadristruma* have been narrowed down to the antennomere count, with 6 segments in the former and 4 in the latter genus. As seen in other dacetine genera (*Epitritus*, *Smithistruma*) this difference is insignificant at genus-level and it is likely that *Quadristruma* will eventually fall into the synonymy of *Strumigenys*.

Of the two species in *Quadristruma* one, *eurycera*, is known only from New Guinea, but the second species, *emmae*, is very widespread in the tropics by dint of being a successful tramp-species. Initially Brown (1949b) thought that the original range of *emmae* lay in the Indomalayan-Papuan area but later he revised this opinion (Brown, 1954) in favour of the Afrotropical region as the place of origin, as a derivation from the *Strumigenys rogeri*-group (in the sense of the 1954 paper, the *arnoldi*-complex of the present study) seemed certain. At that time *emmae* had not been found in sub-Saharan Africa but it was known from Hawaii, Guam, the U.S.A. (Florida), Puerto Rico, the West Indies, Cuba, Surinam, Sumatra, Singapore, and New Guinea (listed by Brown, 1949b). Wilson & Taylor (1967) added the Philippines, New Hebrides and Australia (Queensland) to the list, and Kempf (1972) the Bahamas. Soon after this the species was detected for the first time in West Africa, being recorded from Ghana (Bolton, 1973). The present paper adds localities in India, Malaysia, Sulawesi and Equatorial Guinea to the list, showing that *emmae* is indeed a very accomplished tramp-species and likely to be found in any tropical area of the world.

Quadristruma emmae (Emery)

(Fig. 67)

Epitritus emmae Emery, 1890: 70, pl. 8, fig. 6. Holotype worker, ST THOMAS I. (West Indies) (MCSN) [examined].

Epitritus clypeatus Szabo, 1909: 1, figs 1a, c. Syntype workers, NEW GUINEA: Berlinhafen (*L. Biro*); and SINGAPORE (*L. Biro*) (TM). [Synonymy by Brown, 1949b: 48.]

Epitritus clypeatus var. *malesiana* Forel, 1913a: 83. Syntype workers and female, INDONESIA: Sumatra (*Buttel-Reepen*) (MHN). [Synonymy by Brown, 1949b: 48.]

Epitritus wheeleri Donisthorpe, 1916: 121. Holotype worker, HAWAII: Oahu, Honolulu (*R. C. L. Perkins*) (not in BMNH; presumed lost). [Synonymy by Brown, 1949b: 48.]

Quadristruma emmae (Emery) Brown, 1949b: 48.

WORKER. TL 1.7–1.9, HL 0.43–0.46, HW 0.35–0.39, CI 80–85, ML 0.12–0.14, MI 26–32, SL 0.18–0.22, SI 52–58, PW 0.21–0.25, AL 0.42–0.48 (15 measured).

Mandibles a pair of narrow linear outcurved blades, armed apically with a fork of 2 spiniform teeth of which the upper is the longer. Between the fork teeth the left mandible has 2, and the right mandible 1 or 2, minute intercalary denticles which cannot be seen when the mandibles are closed. Preapical armament consisting on both blades of a single long spiniform tooth at about the apical third of the length and usually also a minute denticle on the margin between the spiniform preapical tooth and the upper tooth of the apical fork, though in some samples this denticle is extremely small and inconspicuous. Anterior clypeal margin broad, projecting well beyond the mandibular bases on each side, with a feeble median impression and with numerous small spatulate to spoon-shaped hairs which are curved towards the midline. Lateral margins of clypeus short and with 2–3 anteriorly curved small spoon-shaped hairs. Preocular laminae broad, running back from the clypeus and anteriorly forming a strong floor below the antennal insertions. Median portion of clypeus broad, finely punctulate and with scale-like to suborbicular hairs present. Dorsum of head behind clypeus reticulate-punctate and with numerous broadly scale-like to orbicular hairs. Outer margins of frontal lobes and divergent upper scrobe margins behind them with a continuous row of scale-like to orbicular hairs, the row terminating at the posterior end of the scrobe in a more or less straight clavate hair on each side. Eyes very small, situated just above the ventral scrobe margin. Antennae with 4 segments, the scapes narrow basally but broadening to the midlength then narrowing again to the apex, the leading edge angular and prominent at about the midlength, with a row of projecting scale-like to spoon-shaped hairs. Pronotum more or less flat dorsally, anteriorly rounding into the sides, posteriorly meeting the sides in a broad blunt angle. In profile the mesonotal dorsum very shallowly convex anteriorly, very shallowly concave posteriorly before meeting the propodeum. Metanotal groove absent. Propodeal dorsum shallowly convex anteriorly, sloping posteriorly to the declivity. Propodeal teeth mostly incorporated in the infradental lamellae, with only a small point projecting. Sides of alitrunk smooth to superficially reticulate. Dorsal alitrunk and at least the upper half of the propodeal declivity reticulate-punctate, the punctures more strongly defined and denser on the pronotum than on the propodeum, where they may be superficial. Pronotal humeri each with a straight clavate hair and mesonotum with a similar but shorter pair of hairs. Ground-pilosity of dorsal alitrunk consisting of numerous small scale-like to broadly spoon-shaped hairs, most of which are closely applied to the surface. In profile the pedicel segments with moderately developed spongiform appendages. The ventral petiolar strip broad and distinct but the lateral lobe of the petiole node small. Lateral and ventral lobes of the postpetiole moderate and a spongiform pad present at the base of the first gastral sternite. Dorsal surface of petiole node finely punctate to reticulate, the postpetiole superficially reticulate to smooth. Posterior spongiform strip of petiole node very narrow, narrower than the strip bordering the anterior margin of the postpetiole. Sides of postpetiole in dorsal view surrounded by spongiform tissue and posteriorly with a narrow bordering strip. Base of first gastral tergite lamellar centrally, spongiform towards the sides, with a continuous row of basal costulae. Petiole, postpetiole and gaster with short straight narrowly clavate hairs. Colour dull yellow to pale brown.

MATERIAL EXAMINED

Ghana: Bunso (*P. Room*). **Equatorial Guinea:** Annobon I., Dint. del Pueblo (*L. Fea*). **Seychelles:** Aldabra I., Grande Terre (*V. Spaul*); Pt Hodoul (*V. Spaul*); Picard (*V. Spaul*); Big Sister I. (*U. Müller*). **India:** no loc. (*P. C. W. Westall*). **West Malaysia:** Sg Patani (*G. H. Lowe*). **Indonesia:** Sulawesi Tengah, Morowali (*M. J. D. Brendall*).

MICRODACETON Santschi

(Figs 78–81)

Microdaceton Santschi, 1913b: 478. Type-species: *Microdaceton exornatum* Santschi, 1913b: 478, by monotypy.

DIAGNOSIS OF WORKER. Afrotropical dacetine ants. Mandibles extended into elongate linear blades (MI 55–69) which terminate in an apical fork of 3 spiniform teeth arranged in a vertical series. Mandibular blades without preapical teeth or denticles. Palp formula 3,2 (as opposed to 1,1 in other African dacetines). Antennal scrobes absent; antennae with 6 segments. Petiole node armed with a pair of teeth or short spines dorsally. Postpetiole lacking spongiform appendages but with lateral alar extensions. Specialized body pilosity absent. Eyes dorsolateral.

Microdaceton, the only Afrotropical member of its genus-group, is closely related to the primarily Australian genera *Colobostruma*, *Mesostruma* and *Epopostruma* (Brown, 1952b; 1953a; Brown & Wilson, 1959; Taylor, 1973). Within the Dacetini this group of genera, the

subtribe Epopostrumiti, is defined by having the eyes placed dorsolaterally, above the scrobes when such are present; the antennae 4- or 6-segmented (the second funicular segment not longer than the rest); the palp formula 3,2 or 5,3; the postpetiole usually with lateral alar extensions. Both known species of *Microdaceton* are restricted to the Afrotropical region, *tibialis* being found in West and central Africa, and *exornatum* being widely distributed in East and South Africa.

List of Afrotropical *Microdaceton*

exornatum Santschi

leakeyi Patrizi **syn. n.**

exornatum var. *laevior* Arnold **syn. n.**

tibialis Weber

Key to species (workers)

- 1 Postpetiole in dorsal view very broad, spanning almost the entire basal width of the first gastral tergite (Fig. 80). The width of the postpetiole 0.60–0.65 times the maximum width of the first gastral tergite. Basigastral costulae usually distinct, rarely faint. Body colour yellow. (Kenya, Zambia, Zimbabwe, South Africa) *exornatum* (p. 402)
- Postpetiole in dorsal view narrow, spanning 0.70 or less of the basal width of the first gastral tergite (Fig. 81). The width of the postpetiole 0.46–0.56 times the maximum width of the first gastral tergite. Basigastral costulae absent. Body colour blackish brown to black. (Ivory Coast, Ghana, Zaire) *tibialis* (p. 403)

Microdaceton exornatum Santschi

(Figs 78, 80)

Microdaceton exornatum Santschi, 1913b: 478. Holotype worker, SOUTH AFRICA: Natal Zululand (*I. Trägårdh*) (not in NMB; presumed lost).

Microdaceton leakeyi Patrizi, 1947: 219, figs 1, 2. Holotype female, KENYA: Masai Reserve, Olorgasalic, iv.1945 (*S. Patrizi*) (IE) [not examined]. **Syn.n.**

Microdaceton exornatum var. *laevior* Arnold, 1948: 225. Syntype workers and female, SOUTH AFRICA: Natal, Zululand, Dukuduku; and Natal, Richard's Bay, February (*J. C. Faure*) (SAM) [examined]. **Syn. n.**

WORKER. TL 3.0–4.0, HL 0.79–1.00, HW 0.76–0.94, CI 92–96, ML 0.48–0.58, MI 55–61, SL 0.50–0.64, SI 66–70, PW 0.40–0.50, AL 0.70–0.90 (10 measured).

Mandibles elongate and linear, without preapical armament but armed apically with a fork of 3 long spiniform teeth set in a more or less vertical series, the apical fork teeth without intercalary denticles. Anterior clypeal margin with a small median notch or indentation. Eyes large and conspicuous, clearly visible in full-face view. Antennal scrobes absent, frontal carinae absent, the antennal fossa ventrally on each side with a small laterally projecting tubercle in front of the eye. Outline shape of head as in Fig. 79. Occipital lobes with 2 pairs of tubercles which are variable in size, the first pair laterodorsal, the second pair at the posteriormost point of the lobes. Clypeus coarsely punctate to narrowly foveolate, with appressed to slightly elevated fine simple ground-pilosity, without standing or specialized hairs of any description. Dorsum of head foveolate, with a fine short simple hair arising from the centre of each foveola, the hairs appressed or nearly so, the head without specialized or standing pilosity. In profile the dorsal surface of the head rising and shallowly convex from the posterior clypeal margin to about the midlength, then suddenly depressed. Sides of head foveolate as dorsum. Dorsal outline of alitrunk dominated by the strong subconical mesonotal teeth or tubercles and the long propodeal spines (Fig. 78), the latter without or only with a vestige of an infradental lamella. Metapleural lobes long and broad, slightly upcurved. Sides of alitrunk foveolate but on the mesopleuron the sculpture may be partially or almost wholly effaced. Dorsal surfaces of pronotum and mesonotum strongly foveolate, the metanotal groove with short longitudinal cross-ribs. Propodeal dorsum reticulate-punctate, sometimes with one or two laterally situated partial foveolae. Alitrunk without specialized or bizarre pilosity, only with fine short simple hairs arising from the foveolar centres. Usually these hairs are very short inconspicuous and appressed, but in some they may be longer and slightly elevated. Petiole in profile without spongiform or alar appendages, armed dorsally with a pair of spines and posterodorsally with a sharp triangular elevation. Postpetiole without spongiform tissue but with strong lateral alar prominences which appear in profile as thick longitudinal crests. In dorsal

view the postpetiole very broad, spanning almost all of the basal width of the first gastral tergite. Basigastral costulae present, usually fine dense and distinctive, only rarely reduced in intensity. Petiole and postpetiole densely reticulate-punctate to granular. Petiole, postpetiole and first gastral tergite without standing hairs of any description, only with minute appressed sparse pubescence. Colour yellow, the appendages paler than the body.

MATERIAL EXAMINED

Zambia: Kipushi (*H. S. Evans*). **Zimbabwe:** Gwebi (*K. J. Wilson*), Chishawasha (*A. Watsham*). **South Africa:** Natal, St Lucia Lake (*J. C. Faure*).

Microdaceton tibialis Weber

(Figs 79, 81)

Microdaceton tibialis Weber, 1952a: 30, fig. 25. Holotype worker, ZAIRE: 37 km N. of Stanleyville (= Kisangani), lat. 0°45'N, long. 25°15'E, 15.iii.1948, rain forest, no. 2218 (*N. A. Weber*) (AMNH) [examined].

WORKER. TL 3.2–3.8, HL 0.88–0.98, HW 0.80–0.90, CI 88–92, ML 0.56–0.66, MI 63–69, SL 0.62–0.72, SI 75–81, PW 0.38–0.47, AL 0.78–0.90 (10 measured).

Answering to the description of *exornatum* in all major features, *tibialis* is distinguished as follows.

exornatum

Mandibles relatively shorter, MI 55–61.
Scapes relatively shorter, SI 66–70.
Postpetiole in dorsal view spanning almost the entire basal width of the first gastral tergite (Fig. 80).
Width of postpetiole in dorsal view 0.60–0.65 × maximum width of first gastral tergite.
Basigastral costulae usually dense and distinct, rarely reduced in intensity.
Body colour yellow.
Laterodorsal cephalic tubercles large and conspicuous.
Petiolar armament spiniform.
Propodeal dorsum with reticulate-punctate sculpture.

tibialis

Mandibles relatively longer, MI 63–69.
Scapes relatively longer, SI 75–81.
Postpetiole in dorsal view spanning 0.70 or less of the basal width of the first gastral tergite (Fig. 81).
Width of postpetiole in dorsal view 0.46–0.56 × maximum width of first gastral tergite.
Basigastral costulae absent, at most with faint shagreening near gastral base.
Body colour black to blackish brown.
Laterodorsal cephalic tubercles vestigial to absent.
Petiolar armament dentiform.
Propodeal dorsum without reticulate-punctate sculpture.

MATERIAL EXAMINED

Ivory Coast: Man, Mt Tonkoui (*V. Mahnert & J.-L. Perret*). **Ghana:** Mampong (*P. Room*); Bunso (*D. Leston*). **Zaire:** Kisangani (*N. A. Weber*).

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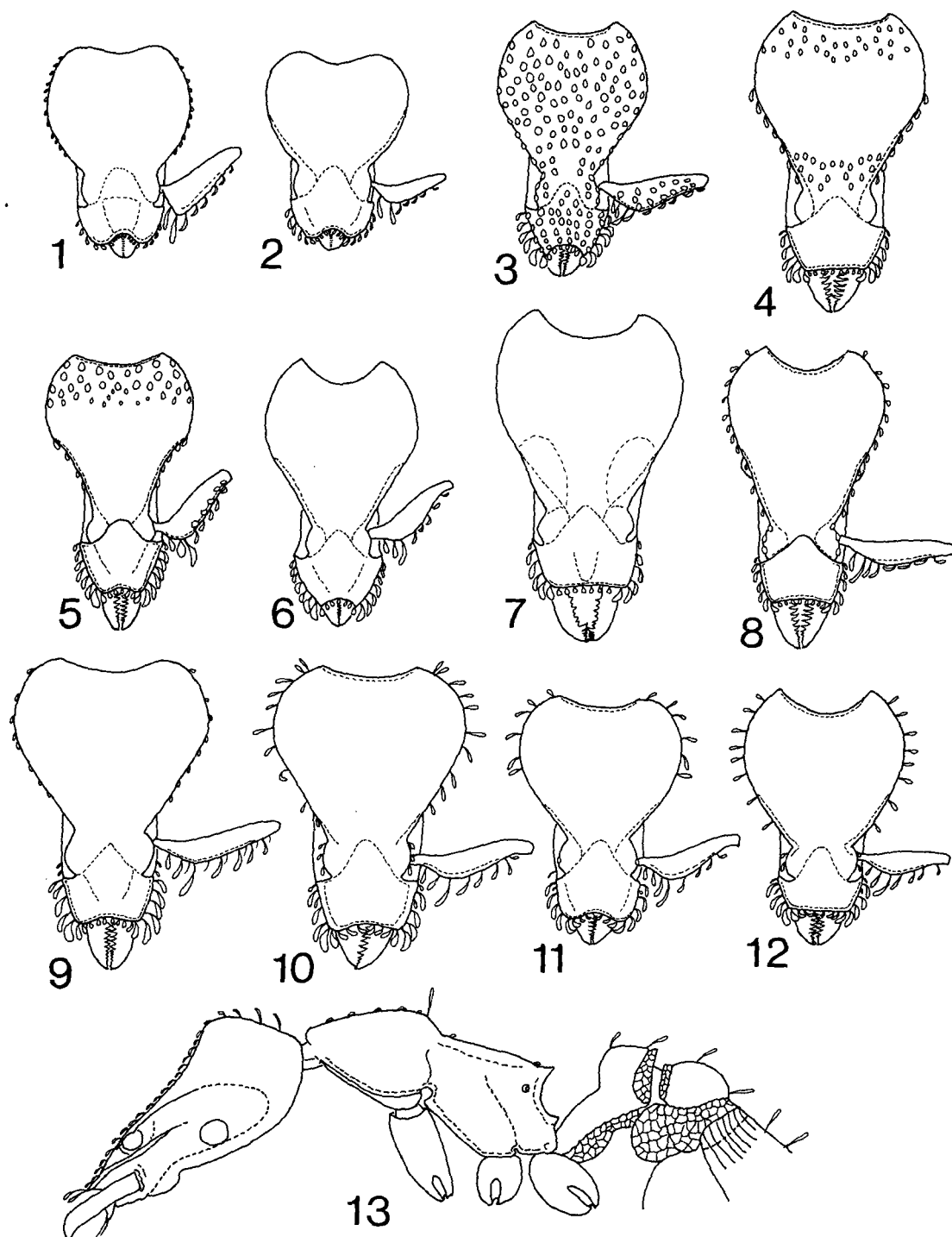
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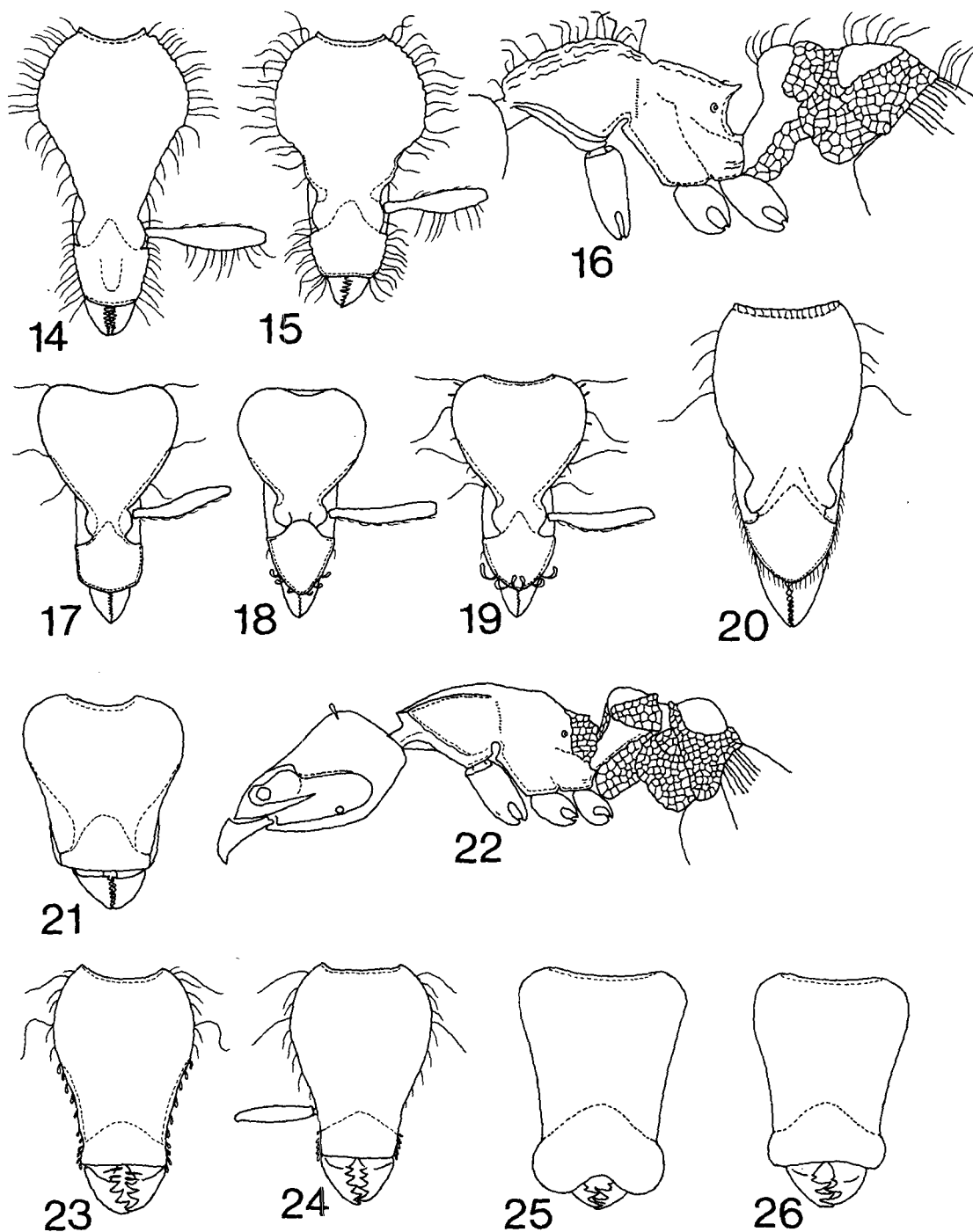
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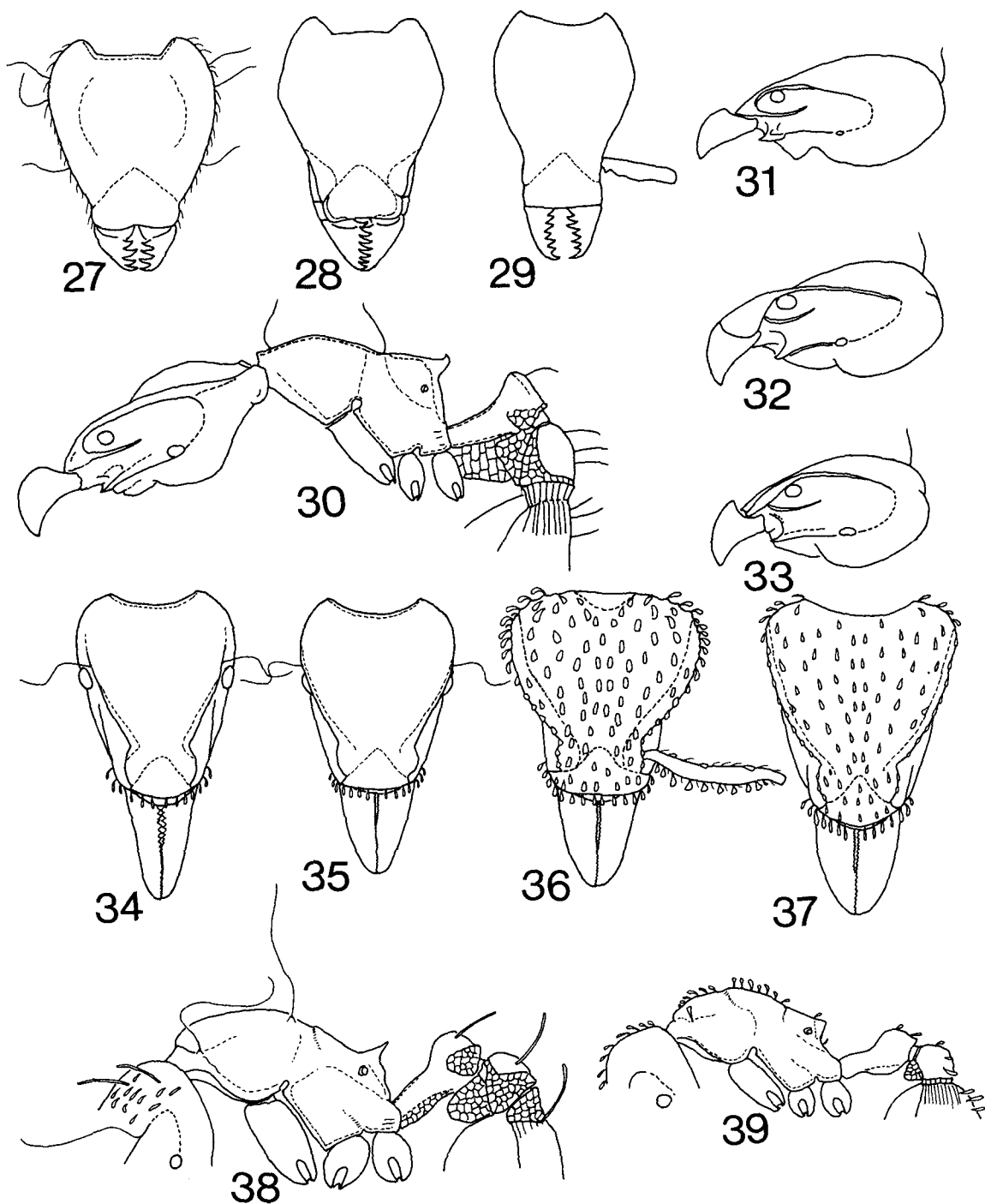
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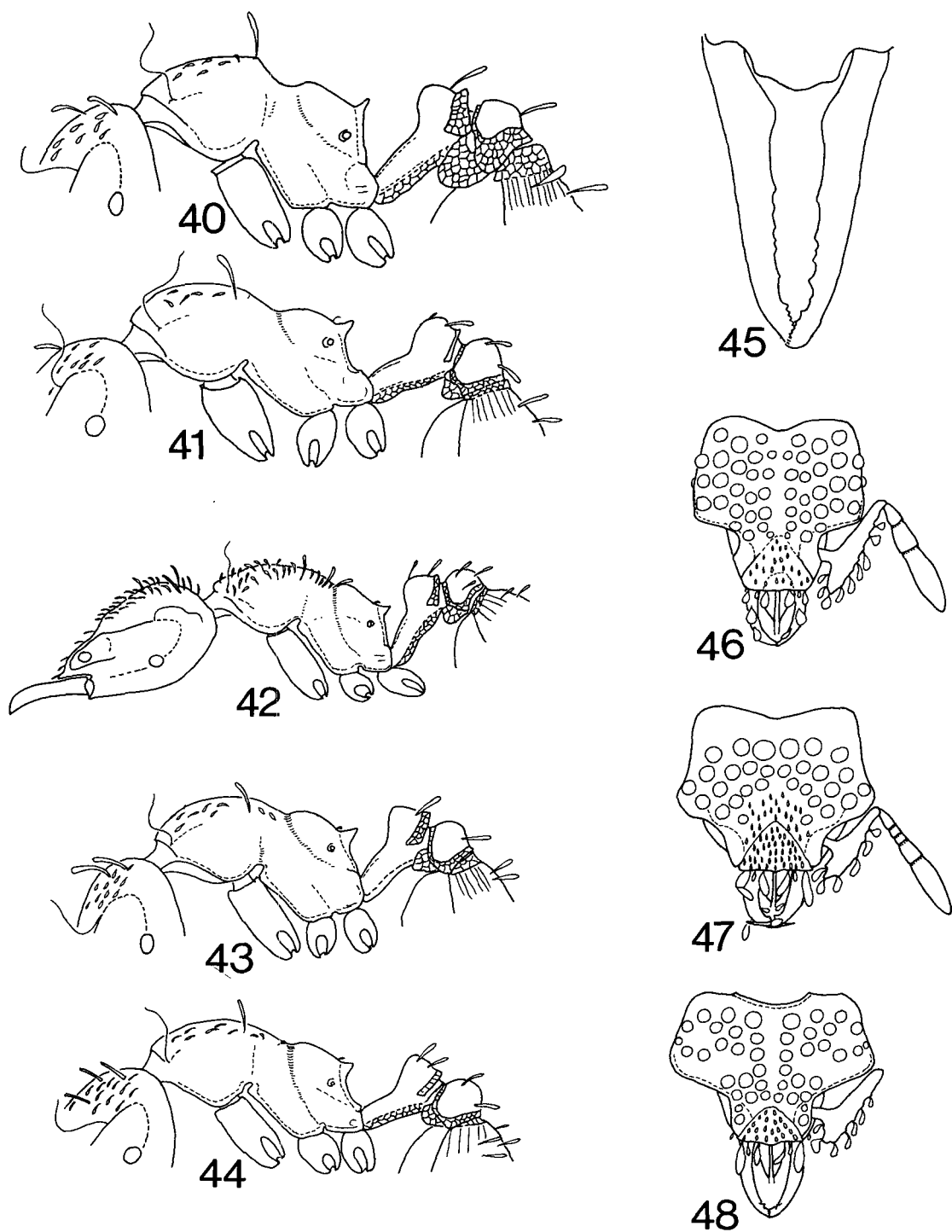
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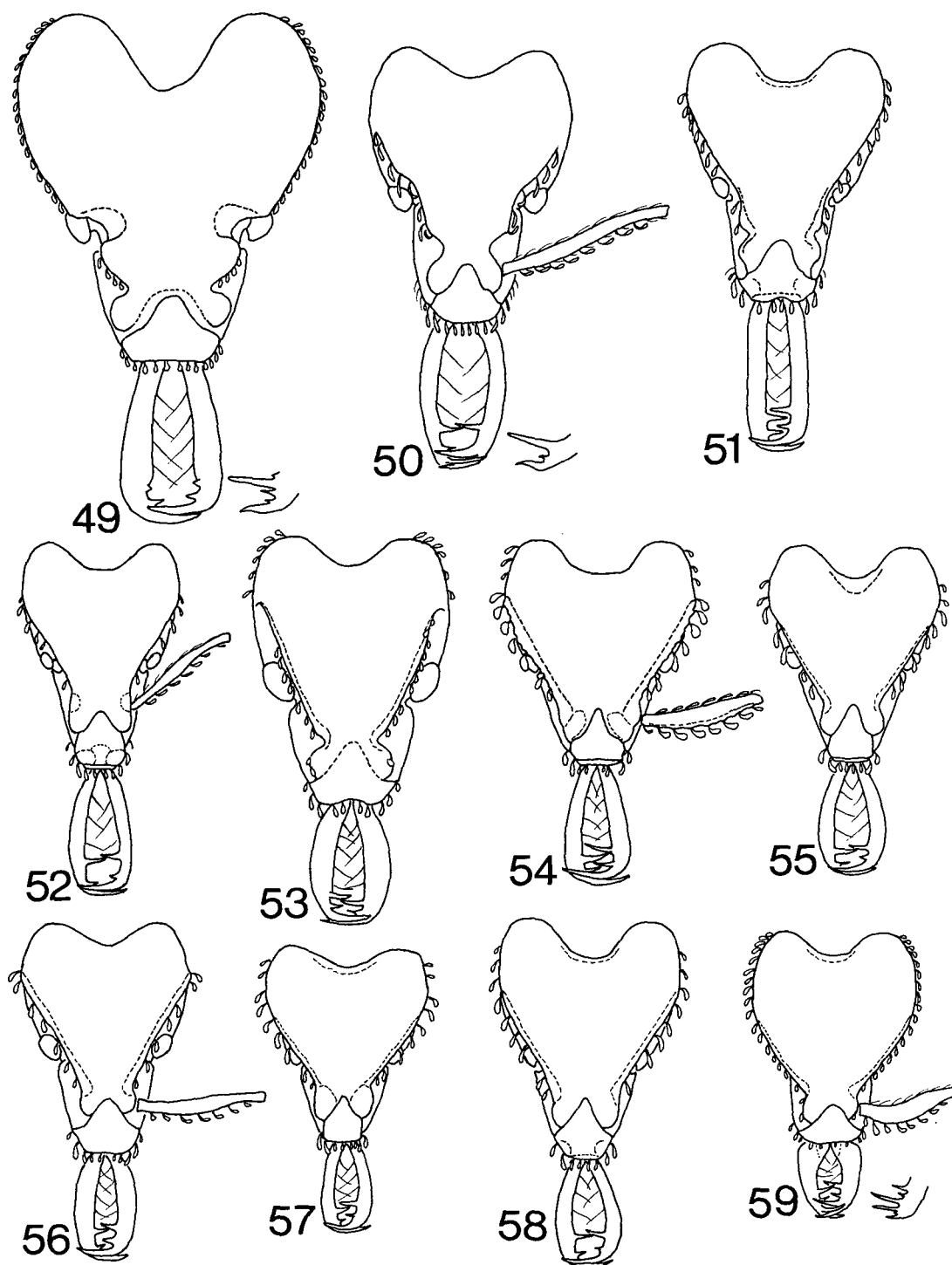
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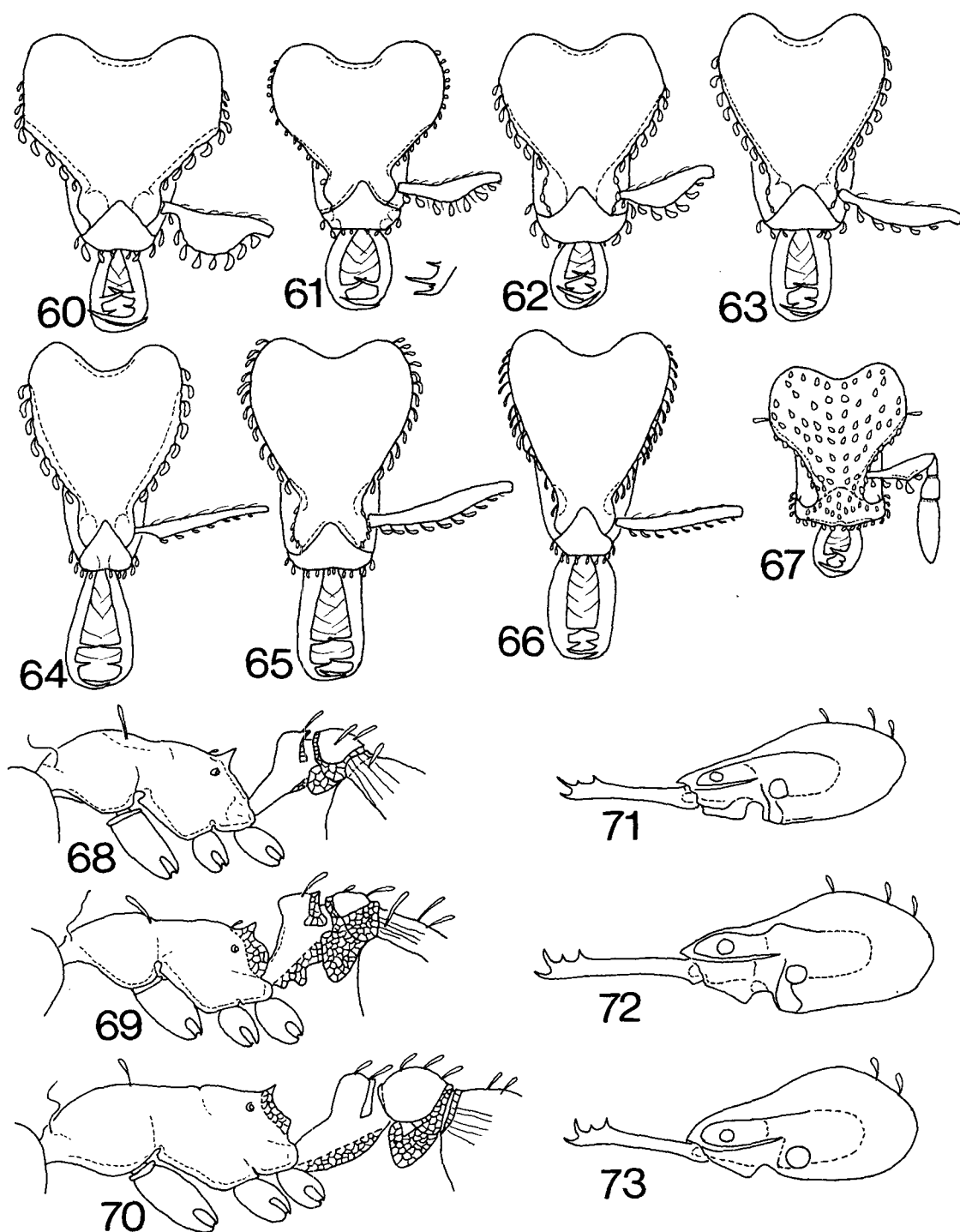
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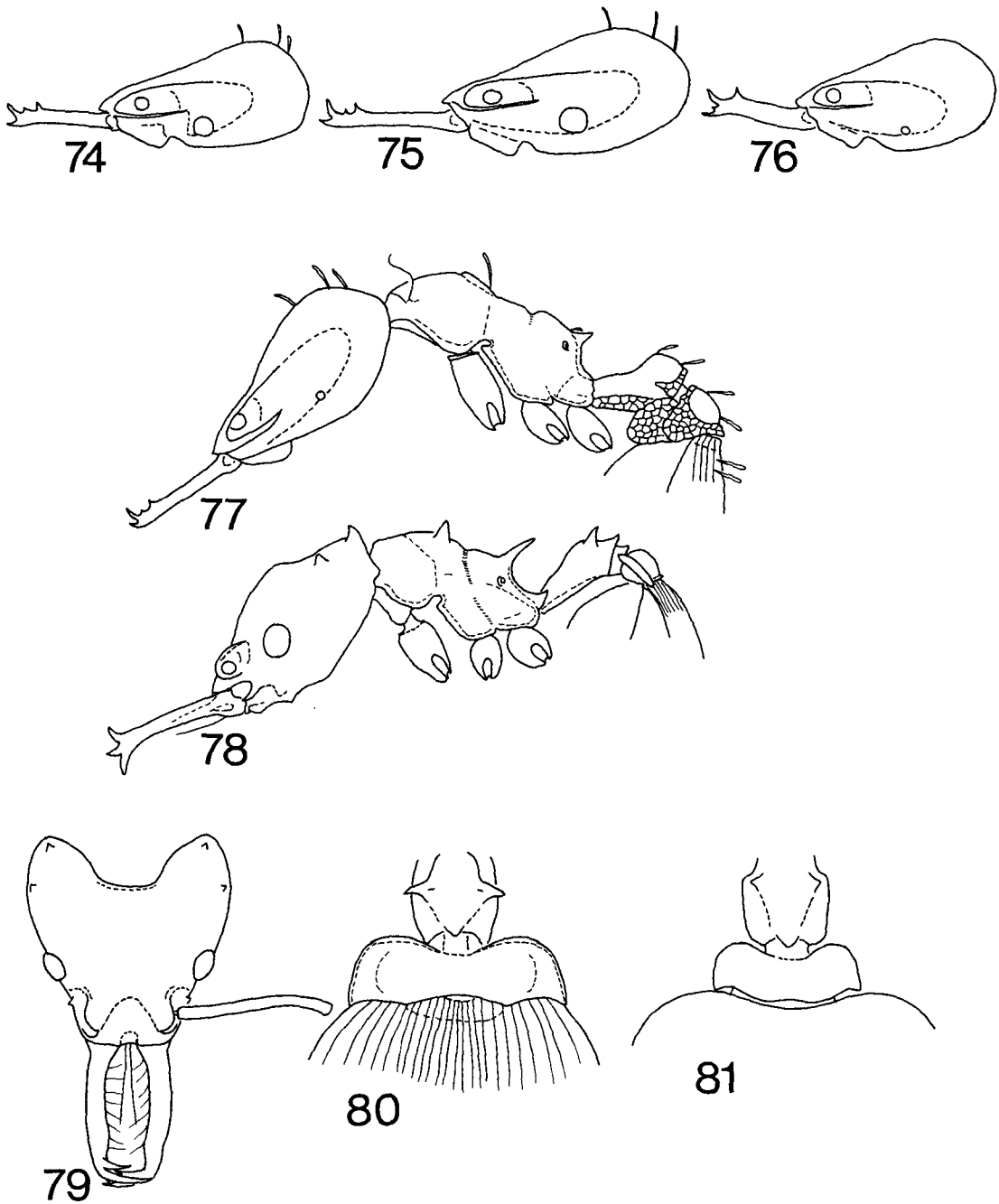
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