

**THE ANT GENUS SMITHISTRUMA:
A FIRST SUPPLEMENT TO THE WORLD REVISION
(HYMENOPTERA: FORMICIDAE)**

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This paper is meant to expand and correct the world revision of *Smithistruma* contained in my revisionary studies of tribe Dacetini (1953, Amer. Midl. Nat., 50: 1-137). Described below are four aberrant new species from the New World; taking account of three species described elsewhere since 1953, and synonymies proposed below, we find that the number of species known for the genus now exceeds 60. But even as this paper was being prepared, a number of new species of *Smithistruma* came in for study or were collected by myself on field trips. Formal description of these species must be deferred, but it is obvious from the rate of accumulation of novelties, especially from tropical areas, that the number of species will eventually pass the count I predicted in 1953 (150 species).

I have included brief notes on some species previously described, particularly from North America, wherever these add to the knowledge of the range, ecology or variation of the species. Measurements and proportions given are explained in the 1953 paper.

***Smithistruma tanymastax* sp. n.**

(Fig. 1)

Holotype worker.—TL 1.7, HL 0.44, HW 0.31 (CI 70), ML 0.12 (MI 27), WL 0.43, antennal scape L 0.26, funiculus L 0.41 mm.

This species is very distinct from all congeners in the form of head and mandibles as seen from full-face view (Fig. 1). Head cuneiform, shallowly excised behind at the occiput; clypeus forming an acute angle terminating in a blunt point in front, and its disc strongly convex from side to side. Eyes small, each with about 6 facets, visible from dorsal full-face view. Transverse postoral groove of gula present, but rather broad and shallow. Mandibles long and slender as seen from the full-face view, about half the exposed length of their inner margins taken up by a long diastema, beyond which each border bears a long series of teeth, closely spaced and like those of other members of the genus. Although the mandibles have not been opened, all teeth seem to be acute, and the principal series consists of the five teeth nearest the base. The basal lamella is largely covered by the

clypeus (in both holotype and paratype), but it appears to have the form of a heavy triangular tooth. As seen from the side, the mandibles are perfect, with about the apical quarter moderately downcurved.

Form of the remainder of the body normal for the genus *Smithistruma*; alitrunk slender, promesonotum moderately depressed and forming a single gently convex dorsal profile interrupted behind at the metanotal groove, which is merely a slight step down to the feebly downsloping propodeal dorsum. Pronotum with a distinct curved anterior margin terminating on each side in bluntly rounded humeral angles. Propodeal teeth short, slightly acute (almost rectangular), continued ventrad as infradental lamellae of nearly even width throughout. Posterior mesonotum with an indistinct median longitudinal carinula, and there is also a carinula along each side of the propodeal dorsum.

Petiolar node rounded above, slightly broader than long, its anterior face sloping and bicarinate into pedicel, its spongiform appendages consisting of a narrow posterodorsal collar that is expanded on each side into a large triangular lobe, also an extremely narrow, midventral transparent carina under the pedicel. Postpetiolar disc convex, nearly twice as broad as long and nearly twice as broad as petiolar node, surrounded on all sides and hung beneath with voluminous spongiform appendages. Gaster with well-developed anteroventral strands and an anterodorsal margin of spongiform tissues; about 12 coarse costulae extend back from the gastric base for approximately $\frac{2}{5}$ the length of its first segment.

Head, alitrunk and petiole reticulate-punctate, opaque; mandibles, sides of alitrunk, postpetiolar disc and gaster predominantly smooth and shining. Antennae and legs finely and densely punctulate, opaque.

Clypeus and anterior margin of scapes with curved, subreclinate, linear-spatulate hairs. Head, dorsum of alitrunk and petiolar node, sides of postpetiolar disc and legs with long, fine, reclinate and subreclinate ground pilosity, this also sparsely distributed on posterior gaster. Longer, outstanding, fine flagelliform hairs: 1 on each lateral occipital border, 2 on each humerus, and about 16 on the gastric dorsum, grouped mainly in double columns on each side of the midline. (The holotype differs from the paratype in that the latter has the petiolar and postpetiolar hairs longer and more flagelliform; the distinction between the ground pilosity and specialized longer flagelliform hairs is in any case slight in this species.) An oblique sensory hair near the midlength of each inner mandibular margin.

Color light ferruginous; mandibles and appendages lighter and more yellowish.

Holotype a single worker from Nova Teutonia, Santa Catarina State, Brazil, altitude 300–500 m. (F. Plaumann leg.), sent to me by Frei Thomas Borgmeier, and to be deposited with the rest of his collection, now under the care of Frei Walter W. Kempf of São Paulo, Brazil.

A single paratype worker [Museum of Comparative Zoology, Harvard University] comes from Chapecó, Santa Catarina, May, 1957 (F. Plaumann leg.): TL 1.8, HL 0.45, HW 0.32 (CI 71), ML 0.12 (MI 27), WL 0.46, antennal scape L 0.28, funiculus L 0.43 mm. Slightly larger and a little darker than the holotype, with gaster lightly infuscated; hairs generally somewhat longer, more abundant and more conspicuous, as already stated in the description above.

The long, slender, broadly diastemate mandibles of *S. tanymastax* will serve to separate it from all known tropical American members of the genus, and it is quite distinct in the shape of the head, and especially of the clypeus, from the two species of the North American *pergandei* group (= subgenus *Wessonistruma*), which are the only other *Smithistruma* species with produced, broadly diastemate mandibles. Since the description above was written, I have become aware of additional specimens of *S. tanymastax* in Brazilian collections, and it appears that the species may turn out to be fairly common locally in southeastern Brazil.

***Smithistruma carolinensis* sp. n.**

(Fig. 2)

Holotype worker.—TL 2.3, HL 0.55, HW 0.41 (CI 75), ML 0.13 (MI 24), WL 0.58 mm.

Form of head as in Fig. 2. Points worthy of note are the broad, rounded clypeus (width ca. $1.5 \times$ length), the anteriorly slightly diverging preocular laminae, and the subangulate scapes. Mandibular dentition approximately as shown in the figure; dentition determined from a paratype with the mandibles opened; note the weak diastema and the large, acute, narrowly triangular basal lamella; 5 teeth in principal apical series; between these and apex, the remaining teeth are minute and denticuliform. In the paratype from which the figure was made, the basalmost tooth of the principal series has an indistinct spur on its basal slope; this spur is present on the left side only, and may be a variable trait as in other North American species of this genus.

S. carolinensis is at first sight very like *S. bunki*, but differs from *bunki* in having longer, heavier mandibles and a broader head and clypeus. The alitrunk also differs in sculpture and pilosity. In *S. carolinensis*, the median longitudinal carinula is distinct (in the proper view and light) from the rear edge of the mesonotum to the anterior pronotal margin, and the dorso-lateral propodeal carinulae are correspondingly more distinct (in *S. bunki*, the median carinula is obsolete on the pronotum and weak on the mesonotum). The reticulate ground sculpture of the pronotal dorsum is largely

effaced and replaced by an indistinct, shallow, loose, longitudinal substriation, contrasting with the distinct fine reticulo-punctation of the mesonotum and weakly shining (in *S. bunki*, the entire dorsum of the alitrunk is evenly reticulopunctate and opaque). Sides of alitrunk smooth and shining. Alitruncal pilosity similar in the two species, except that the types of *carolinensis* have the paired humeral hairs long and flagelliform, and there is a second pair of long flagelliform hairs straddling the mesonotum; there are no long mesonotal hairs developed in any of the known samples of *bunki*.

In other characters studied, the *carolinensis* types are within the range of variability of *S. bunki*.

Holotype and one paratype worker taken in a mature forest of live oak (*Quercus virginiana*) and loblolly pine (*Pinus taeda*) along U. S. Route 17 about 1 mile east of Ravenel, Charleston County, South Carolina, on June 9, 1957 (E. O. Wilson and W. L. Brown, Jr. leg.). The workers were taken separately in different parts of the woods, deep in the thick needle litter at the base of large pines. Additional paratypes (2 specimens measured) are in a small series of workers from near Marshville, Union County, North Carolina, in an open, rather dry stand of post oak (*Q. stellata*) and black jack oak (*Q. marilandica*), August 9, 1961 (W. G. Carter leg.). The ants came from oak leaf mold in a depression.

Paratype range: TL 2.1–2.4, HL 0.55–0.56, HW 0.39–0.41 (CI 71–73), ML 0.12–0.14 (MI 22–25), WL 0.54–0.58 mm.

Holotype and paratypes deposited in the Museum of Comparative Zoology at Harvard University; paratypes will be placed in the U. S. National Museum, the collection of Dr. W. G. Carter at Oklahoma State University, and the Academy of Natural Sciences in Philadelphia.

This new species has the broad head and the large mandibles of *Smithistruma abdita*, but the pilosity is less abundant and the hairs broader. It may be regarded as intermediate between *S. bunki* and *S. abdita*.

Smithistruma probatrix sp. n.

(Fig. 3)

Holotype worker.—TL 2.7, HL 0.67, HW 0.41 (CI 61), ML 0.17 (MI 25), WL 0.72, antennal scape L 0.36, funiculus L 0.67, apical funicular segment L 0.33 mm.

A slender, long-legged species with head and mandibles drawn out to an unusual length in front, and the antennae correspondingly elongate; otherwise a rather typical member of *Smithistruma*.

Head and mandibles as in Fig. 3; note the extremely long, low basal lamella of the mandible, the virtual lack of a diastema, and the brief series of teeth. Mandibles porrect as seen from the side, only very slightly down-curved at the apex. Clypeus convex from side to side, but only very slightly so from front to rear, with a distinct median tumulus that is shining anteriorly. Antennae elongate, especially the apical and penultimate segments of the funiculus, the penultimate thickest; segment III about as broad as long.

Gula weakly convex; postoral region with a gentle concavity reaching from side to side, but this scarcely constitutes a postoral groove. Alitrunk long and slender, the promesonotum forming one long convexity in profile, sloping gently down posteriad to meet the horizontal, feebly convex propodeal dorsum at a weakly impressed metanotal groove. Propodeal teeth short, acutely triangular, subtended each by a distinct propodeal lamella that is concave above and convex below.

Propodeum with an elongate node (longer than high, longer than broad, slightly longer than its anterior peduncle) with voluminous posterolateral and moderate ventral spongiform appendages. Postpetiolar disc subcircular, truncate in front as seen from above, slightly broader than petiolar node and slightly broader than long, with voluminous spongiform appendages in all the normal positions. Gaster with a short anteroventral spongiform beard and an anterodorsal spongiform fringe, from which extends a small number of very short longitudinal dorsal costulae; gaster otherwise smooth and shining.

Rest of body densely reticulopunctate and opaque, except for a small, sparsely punctulate central patch on the mesopleuron, which is more or less shining. Mandibles, antennae and legs finely and densely punctulate, opaque.

Ground pilosity consisting of short, curved reclinate, fine hairs with blunt or pointed tips, abundant and forming an almost woolly covering over the promesonotum, less abundant on the head, propodeum, petiolar node, mandibles and appendages; absent on postpetiole and gaster. Clypeal hairs short, sparse, reclinate over disc, directed anterolaterad; fringing hairs short and inconspicuous (Fig. 3). Specialized erect hairs long and finely flagelliform: a pair on the lateral borders of the occipital lobes (Fig. 3) and another pair between these on the vertex; a humeral pair and another pair astride the mesonotum; 2 or 3 pairs each on the two nodes; about 20-24 hairs on the gaster, with a few shorter ones also beneath the gastric apex. Last two antennal segments with a number of conspicuous curved subreclinate hairs.

Color deep brownish-red, gaster darkest; mandibles and appendages a trifle lighter and more yellowish.

Holotype worker, a unique, from Ocosingo, Chiapas, Mexico, June 25, 1950, in a Berlese funnel sample from an unknown habitat (C. and M. Goodnight and L. J. Stannard leg.), deposited in the Museum of Comparative Zoology, Harvard University. This species is instantly recognized by the very elongate head and antennae. One is tempted to suppose that it may feed on collembolans that it extracts from narrow crevices where they may have taken shelter.

Smithistruma kyidrifformis sp. n.

(Figs. 4, 5)

Holotype worker.—TL 1.8, HL 0.48, HW 0.40 (CI 83), ML 0.12 (MI 25), WL 0.46; antennal scape L 0.24, funiculus L 0.41 mm., of which half or very slightly more is taken up by the apical segment.

A small, compact species with a rather broad, subtriangular head (Fig. 4) and a short, dorsally rounded alitrunk with reduced propodeal lamellae (Fig. 5).

Mandibles porrect, gently downcurved apicad, with a broad but low and rounded basal lamella and beyond this, with no intervening diastema, a set of short acute teeth and denticles in the pattern usual for the genus. Head convex dorsally, but with a well-marked median impression or sulcus on the vertex. Posterior occipital excision broad and shallow. Clypeus convex in both directions, sloping steeply to its anterior margin, which is almost down to the level of the mandibles. No tumulus detectable on clypeus. Gula convex, no distinct transverse postoral groove. Antennae short and thick; funicular segment III as broad as or slightly broader than long.

Pronotum rounded in front, with a barely perceptible anterior margin, but no humeral angles or tubercles. Promesonotal suture and metanotal groove marked only by faint impressed lines. Propodeal teeth lacking as such, propodeal lamellae reduced, almost cariniform (Fig. 5). Petiolar node not very distinct from its peduncle in dorsal view, broader than long. Postpetiolar node proper subreniform, about half again as broad as petiolar node. Basal costulae of gaster coarse, about 12 in number, the middle ones extending about $\frac{1}{2}$ the length of the first segment. Legs short and robust, especially the tibiae. Spongiform appendages only moderately well-developed (Fig. 5).

Head, alitrunk and both nodes densely reticulopunctate and opaque, except for clypeus and center of postpetiole, which have punctulation feeble and spaced and are predominantly smooth and shining. Mandibles, antennae and legs finely punctulate and subopaque. Almost the entire sides of the alitrunk, sides of petiolar pedicel, and gaster throughout, smooth and shining.

Body clothed in abundant, but not conspicuous, short, curved, reclinate to appressed, rather fine hairs, mostly directed toward the midline on head,

alitrunk and gaster; becoming a little longer and obliquely erect on gaster, especially toward apex. Hairs on appendages like those on body, but a little sparser. Clypeal hairs directed anteromesad, those on the free margin about 20, not appressed but reclinate, inclined toward the midline, not forming a conspicuous fringe. No specialized erect hairs on head or alitrunk, and only a few stiffly erect hairs at the gastric apex are moderately long.

Color ferruginous yellow; gaster feebly infuscated in the middle above.

Holotype a single specimen from Parque Nacional Finca El Rey, Prov. Salta, Argentina, February 23, 1953 (N. Kusnezov leg.), taken with workers of the ponerine ant *Typhlomyrmex pusillus*; holotype deposited in Museum of Comparative Zoology, Harvard University. The type locality is in mesophytic subtropical forest about 1100 m. above sea level, Lat. 24° 32' S, in the mountains separating the Valley of Las Cuestas from that of Aguas Blancas, some 50–70 km. east of Ciudad Salta.

This species is named for its convergent resemblance, especially in the rounded, unarmed alitrunk and its head shape and reduced pilosity, to the workers of the Old World genus *Kyidris*. These same features will serve to distinguish it from all other known *Smithistruma* species. The mandibular dentition is of the *Smithistruma* pattern, even though the basal lamella is relatively lower than those of most other species.

Notes on Some of the Older Species of Smithistruma.—In recent years, extensive collections of *Smithistruma* have been made in North Carolina by Dr. W. G. Carter (for a summary, see Carter, 1962, Jour. Elisha Mitchell Sci. Soc., 72: 150–204). I have studied much of Carter's material, and therefore some of the same records are discussed in both of our papers where it seems useful toward the emphasis I have chosen.

Smithistruma abdita (L. and R. Wesson)

This northern species is now known to extend southward in the Appalachians. I have a series from Great Smoky Mountains National Park at 2600 feet altitude (W. J. Cloyd leg.) and a specimen taken at Ivy, Albemarle Co., Virginia (J. Meem leg.). To the west, a colony with winged males and females comes from a lawn in Champaign, Illinois (R. K. Benjamin leg.), August 11, 1956. All of the above collections come from under rocks in the soil. From still further west comes a winged female taken at

Sioux City, Iowa (C. N. Ainslie leg., from collection of W. F. Buren).

The specimens with short mandibles from Ohio and Indiana, mentioned in my 1953 revision, are not *abdita*, but are actually specimens of another species that may be undescribed. (For further details, see the discussion at the end of this list under "Indeterminate forms of *Smithistruma*.")

Smithistruma angulata (M. R. Smith)

A single dealated female comes from Giant City State Park in southern Illinois (G. and A. Ulrich leg.), in the same vial with series of *S. ohioensis* and *S. ornata*. During two weeks of intensive collecting in Giant City State Park during the summer of 1958, I failed to retake this rare species.

Smithistruma alberti (Forel)

A small sample of this widespread species comes from Progreso, Chiriqui Prov., Panama (F. M. Gaige leg.). P. F. Darlington and I took a number of series at and near Belém, Pará; and I took some colonies at Manaus, and, much farther up the river, at Benjamin Constant, Amazonas. This species nests in or beneath rotten logs and is often found under their bark.

Smithistruma bimarginata (L. and R. Wesson)

Two workers were taken in *Andropogon* sod (*S. talpa* came from the same sod sample) at Red Hills State Park, Illinois (Smith and Stannard leg.). It has previously been recorded from southern Illinois and southern Ohio.

Smithistruma bunki Brown

A dealate female comes from Duval Co., 15 miles west of Jacksonville, Florida on March 28, 1927 (T. H. Hubbell leg.).

Smithistruma californica Brown

A third female specimen with the same data as the types has been found in the Collection of the Department of Entomology, Cornell University.

Smithistruma clypeata (Roger)

A number of samples of this species have come in, some of them marginal in range or altitude: Buhl, Tuscaloosa Co., Alabama, 2 nests in rotten chips, swampy river bottom forest (E. O. Wilson and W. L. Brown leg.). One mile south of De Soto State Park, De Kalb Co., Alabama (Wilson and Brown leg.). Santeetlah Lake Dam, North Carolina (A. C. Cole leg.). Cades Cove, Great Smoky Mountains National Park, 2,000 feet altitude (H. S. Dybas leg.). Howardsville, Ocean Co., New Jersey, worker in rotten log in oak grove on sand (W. L. Brown leg.). A worker from Donaldson, Arkansas, in forest debris (H. H. Ross and L. J. Stannard leg.) extends the range westward.

Smithistruma cloydi Pfitzer

Jour. Tennessee Acad. Sci., 26: 198-200, 3 figs. (1951).

This interesting species combines characters of *S. ornata* or *S. dietrichi* with those of *S. reflexa*. It has not been found again since the types were taken (near Knoxville, Tennessee).

Smithistruma creightoni (M. R. Smith)

Long known only from Alabama and Washington, D. C., *S. creightoni* has since turned up from intermediate localities: Chilhowee Mountains, Sevier Co., Tennessee, nest with winged males, August 1, 1949 (A. C. Cole leg.). Carteret Co. and near Southern Pines, North Carolina, both collections in leaf litter berlesates (W. G. Carter leg.). Sewance, Tennessee (J. S. Ayars leg.). Decatur Co., Georgia, one worker from a molasses trap (P. B. Kannooski leg, No. 1177).

Smithistruma depressiceps (Weber)

A colony agreeing well with the type series (type locality is in British Guiana) was taken in hollow rotten stick about 1 cm in diameter lying in the leaf litter of wet ravine forest at about 800 m altitude on Cerro Campana, Panamá Prov., Panamá (W. L. Brown leg.). This is only the second record for the species.

Smithistruma dietrichi (M. R. Smith)

Although quite a number of samples of this species have come

in since the 1953 paper was written, the known range has not increased very significantly since then. Most of the new records, like the old ones, are from nest sites in or under the bark of large rotting logs or stumps. Dr. W. G. Carter has, however, recovered foraging workers from several localities in North Carolina in leaf litter of cedar and oak; whether or not they were nesting in wood, we do not know. Two workers come from a rot hole at the base of a turkey oak in Decatur Co., Georgia (P. B. Kannoiski leg.).

Smithistruma dubia Brown

This species was described from the Palau Islands, and it was originally considered that it might possibly be the same species so poorly described by Wheeler as *Strumigenys mumfordi* (q. v. infra). It is now clear that the two species are distinct, and that *S. dubia* is a New Guinea ant that has spread to certain Pacific island areas, possibly by way of human commerce. From New Guinea, I have seen samples from the lower Busu River, Huon Peninsula (E. O. Wilson leg., No. 899); from Bubia, 13 km. NW of Lae (Wilson leg., No. 679) and from Bisianumu, near Sogeri, Papua (Wilson leg.); all of Wilson's localities were in rain forest. From Micronesia, I have seen specimens from Truk: Mt. Unibot, Tol Island (L. Gressitt leg.) and from Ponape: Awakpa, U District (H. S. Dybas leg.). From Western Samoa, a worker comes from Lauili Island, north coast of Upolu, leaf litter and soil berlesate, rain forest (T. W. Woodward leg.).

Smithistruma emarginata (Mayr)

A worker from Dundo, on the Luachima River, Angola, from soil debris (A. B. Machado leg.) agrees well with *S. emarginata* samples from Southern Rhodesia and Zululand, but has not only the occipital, but also the complete set of alitruncal hairs short and spoon-shaped. The Angolan sample thus represents an opposite extreme to the tendency in the Zululand specimens toward longer, erect pilosity on occipital region and alitrunk. If this exceedingly sparse representation of the range is faithful, the pilosity variation appears to be clinal.

Smithistruma emiliae (Forel)

Strumigenys Emiliae Forel, 1907, Ann. Mus. Nat. Hungar., 5: 11-12, worker.

Type locality: Asuncion, Paraguay.

Smithistruma (Smithistruma) alegrensis Brown, 1953, Amer. Midl. Nat., 50: 103, pl. 2, fig. 22, worker. Type locality: Porto Alegre, Rio Grande do Sul, Brazil. **New synonym.**

Through the kindness of Curator Elizabetha Bajári of the Hungarian National Museum, I have been able to see the holotype of *S. emiliae*, which proves to be a slightly larger worker of the species I described as *alegrensis*. The *emiliae* type measures: TL 2.1, HL 0.55, HW 0.42 (CI 76), ML 0.10 (MI 18), WL 0.55 mm. The infradental lamellae of the propodeum are a trifle wider and more convex below than in the *alegrensis* types. The dentition is not clearly visible, but what can be seen is similar to that of the *alegrensis* types. Forel misdescribed the important sculptural quality of the postpetiolar disc as "densely reticulate-punctulate, opaque," whereas the *emiliae* type, like the *alegrensis* series, has the postpetiolar surface predominantly smooth and shining.

Smithistruma epinotalis (Weber)

Two new records from southern Mexico further confirm the tendency of this species to nest, like other *schulzi* group members, in plant cavities: Veracruz, Veracruz, in hollow twigs (N. L. H. Krauss leg.); Laguna Ocotal Grande, 950 m. Ocosingo Valley, Chiapas, in epiphytic *Tillandsia* bulb in pine forest (R. L. Dresler leg.).

Smithistruma filirrhina Brown

This species was described from a single worker taken in pineholly leaf mold in North Carolina. Since then, I have examined a series of workers from Tryon, North Carolina, in leaf mold (L. Eisenach leg.); and a single worker from Champion Springs, Annapolis, Missouri (G. A. Ulrich leg.).

Smithistruma filitalpa Brown

I refer to this species a single worker taken under a stone bordering the lawn at the Main Lodge, Brown County State Park, Indiana (E. O. Wilson leg.). Some of the clypeal hairs

are curved slightly laterad as well as forward, but all are very fine, as in the holotype, and other characters agree well. The holotype, the only previously known specimen of the species, came from Pike Co., Arkansas.

Smithistruma fridericimuelleri (Forel)

A small series of workers from Progreso, Chiriqui Prov., Panama (F. M. Gaige leg.) is much like the types (from southeastern Brazil) except that the smooth and shining part of the promesonotum extends back farther and is more conspicuous, passing posteriad into variably distinct longitudinal striation. These specimens could well represent a distinct undescribed species, but more material is needed in this complex before relationships become clear.

Smithistruma hyphata (Brown)

During our field trip in the Amazon Basin, P. F. Darlington took a worker of this species in leaf litter of a degraded rain forest tract at Utinga, near Belém, Pará, Brazil. The species was previously known only from Trinidad.

Smithistruma laevinasis (M. R. Smith)

Some recent records extend the range of this form into North Carolina: Old Fort (A. C. Cole, Jr., leg.); 4 miles S. Dillsboro, Jackson Co. (H. S. Dybas leg.); Asheville, oak-hardwood leaf mold (W. G. Carter leg.); Catawba Co., oak-beech-hardwood forest in stream ravine (Carter leg.). In addition, a dealate female comes from Dauphin Island, Mobile Co., Alabama, pine tree-crotch hole (W. Suter leg.).

Females from North Carolina and Alabama lack the deep anterior scutal pit found in the Knoxville specimens and mentioned in my 1953 revision as a possible species character. The pit must now be counted as a pathological or other abnormality in the females of a single nest or locality in eastern Tennessee, and it therefore has no significance for formal taxonomy.

Smithistruma margaritae (Forel)

Decatur Co., Georgia, one worker (P. B. Kannoowski leg.). Finca El Real, Ocosingo Valley, Chiapas, Mexico, "beating," one worker (C. and M. Goodnight and L. J. Stannard leg.).

Smithistruma missouriensis (M. R. Smith)

Material placed under this name in the Collection of the Museum of Comparative Zoology has been added to from North Carolina, Illinois and Iowa. The whole array of specimens, new and old, shows rather extreme variation in shape of clypeus, length and width of mandibles, and in pilosity, that would correspond normally to two or three different species if it were not for the apparent lack of clean-cut distinctions between presumptive taxa. The connection between *S. missouriensis* and *S. reflexa* is particularly puzzling. In order to put the taxonomy of this group on a firm footing, we need much more material.

The specimens from Ames, Iowa (W. F. Buren leg.) were formerly determined by Buren as *S. pulchella*.

Smithistruma mumfordi (Wheeler)

The doubts about Wheeler's description expressed in my 1953 revision prove to have been more than fully justified, as I have learned by examining a syntype worker from the B. P. Bishop Museum (courtesy of Dr. Bryan). This specimen, although it lacked the postpetiole and gaster, measured 1.86 mm. in length, including the closed mandibles. Entire, the insect undoubtedly measured about 2.8 or 2.9 mm. in TL, whereas Wheeler gave the length as "1 mm."

S. mumfordi is a member of the *capitata* group, coming close to *S. dohertyi*, *S. lamellignatha*, etc. Due to the lack of specimens of *S. inezae*, I cannot say how *S. mumfordi* is related to that species; the two might even be synonymous, since *S. mumfordi* is probably an introduced species in the Marquesas, brought from Indonesia or Melanesia by man.

Syntype worker (defective) from Ooumu, 4050 feet altitude, Nukuhiva, Marquesas Islands (Mumford and Adamson leg.).—HL 0.69, HW 0.52 (CI 75), ML 0.15 (MI 22), WL 0.70, petiole L 0.32 mm.

Promesonotum gently convex; a gently concave depression centered on the mesonotum; propodeum gently convex in profile. Propodeal teeth acute, short, slightly less than half as long as the distance between the centers of their bases; infradental lamellae narrow, even in width, following the concave outline of the propodeal declivity as seen from the side. Petiolar node rounded above, without perceptible anterodorsal carinae, slightly broader than long, and about as long as its slender peduncle. Sides of

alitrunk densely punctulate except for a narrow strip along the ventral margin of the mesokatepisternum. No perceptible median carinula on alitruncal dorsum; humeri rounded, without developed tubercles.

Narrowly remiform hairs, erect and suberect, conspicuous, in the usual pattern on the occiput, one large and one small pairs on the mesonotum. Of the conspicuous hairs fringing the anterior scape border, Nos. 1, 2, 5, 6, 7, and possibly 8 are curved outward, while the longest hairs, third and fourth from the base, are curved inward (basad). Petiolar node anteriorly with a small pair, behind with a larger pair, curved caudad.

Mandibular dentition in plan much as in *dubia*: basal lamella low and fairly long, followed by the teeth of the principal series without a diastema; counting from the base outward, there are two medium acute teeth, a very long tooth, a tooth with rounded lamella, a smaller acute tooth, another, smaller tooth with rounded lamella, a small, acute tooth, four denticles and the larger apical tooth (= 12 teeth).

Smithistruma nigrescens (Wheeler)

In addition to many samples taken by E. O. Wilson in various Cuban localities I have series taken by him in Palmar, Dept. Puntarenas, on the Pacific side of Costa Rica, in rain forest.

Smithistruma ohioensis (Kennedy and Schramm)

I found this species rather common in Giant City State Park, and at nearby Grassy Lake, near Carbondale in southern Illinois, nesting in rotten logs or rotten chips in the leaf litter in rich hardwood forest on August 11 and 12, 1958. Males, but no females with wings, were still present in some nests; presumably the females had all already flown. *S. ohioensis* is newly recorded from four states: Athens, Georgia, in tree-crotch hole (W. Suter leg.). Brown County, Indiana, a worker from mud and thin litter under red cedar at the edge of bottomland flood forest near the entrance to the State Park (W. L. Brown leg.). Howardsville, Ocean Co., New Jersey, a worker from a small rotten log in a thicket, oak grove on white sand (Brown leg.). Christiana, Delaware (R. S. Howard leg.).

Smithistruma ornata (Mayr)

This species has come in large numbers (about 40 separate collections) from several states, particularly North Carolina, Mississippi, Florida and Illinois, since the 1953 paper was written. Records from new states or areas, all collections, unless otherwise

mentioned, made in leaf litter or "forest debris": Warren's Woods, Lakeside, Berrien Co., Michigan, beech tree-hole mold berlesate (O. Park leg.). Weingarten, Missouri (Smith and Stannard leg.). About 4 miles north of Englewood, McMinn Co., Tennessee, hardwood leaf litter (W. L. Brown leg.). Fulton, Tennessee (L. J. Stannard leg.). South outlet of Santee River, South Carolina, live oak on sand, under rotten branch (Brown and Wilson leg.). Minden, Jena and Calhoun, Louisiana (H. H. Ross and L. J. Stannard leg.). Donaldson, Arkansas (Ross and Stannard leg.). Linden, Texas (Smith and Berger leg.). About 4 miles north of Laurel, Delaware, under bark of small pine log in litter (Wilson and Brown leg.).

Smithistruma pergandei (Emery)

Since 1953, I have taken this species on several occasions around Boston, Massachusetts: Woburn, Winchester, Arlington, Lexington, Cambridge and Billerica. The last-named is the northernmost locality from which any dacetine has been taken in the New World. One nest found contained over 700 workers. In New England, this species nests under rocks in or near the nests of *Formica* spp., *Camponotus americanus* and other common ants.

New western records: Novinger, Missouri (Evers and Stannard leg.). Lawrence, Kansas (M. W. Sanderson leg.). There are also some additional records from Illinois: White Heath, Piatt Co.; Urbana; Peoria (O. Park leg.); the Illinois samples here reported are all from rotten logs or stumps in or near the nests of other ants.

Smithistruma pilinasis (Forel)

Strumigenys clypeata var. *pilinasis* Forel, 1901, Ann. Soc. Ent. Belg., 45: 339, worker. Type locality: Bank of the Potomac River, near Washington, D. C.

Strumigenys (Cephaloxys) clypeata var. *brevisetosa* M. R. Smith, 1931, Ann. Ent. Soc. Amer., 24: 700, pl. 3, fig. 12, worker. Type locality: Lucedale, Mississippi. **New synonym.**

The differences between *pilinasis* and *brevisetosa* have become so blurred through material examined since the 1953 revision was written that I am forced to consider the names as synonyms rep-

representing a single moderately variable species. There is a tendency for samples from the northern parts of the range to have the clypeus more narrowly rounded, and some of these have the clypeus more opaquely sculptured than in southern series, but the variation is both broadly clinal and locally irregular.

The following are new records: Algiers, Louisiana, nest at base of fig tree (R. S. Howard leg.). Farner, Polk Co., Tennessee (W. J. Cloyd leg.). Pickle's Spring, Weingarten, Missouri, forest debris (Smith and Stannard leg.). Donaldson and Bryant, both in Arkansas, forest debris (H. H. Ross and L. J. Stannard leg.). Boneyard Lake, Raleigh, North Carolina, nesting in soil (M. W. Wing leg.).

Smithistruma pulchella (Emery)

A number of records of *S. pulchella* could be added to the 1953 statement of its range, but all of these are within that range. The specimens listed in 1953 as from Ames, Iowa, represent a misdetermination (see under *S. missouriensis*, above), so this record should be deleted from the range of the species. *S. pulchella* usually nests in rotten wood at the red or chocolate crumb-ling stage, and is frequently found in the rot-meal collecting within the hollow bases of trees such as the sycamore

Smithistruma schulzi (Emery)

Thanks to the courtesy of Dott. Delfa Guiglia, of the Museo Civico at Genoa, I have been able to see two syntype workers of *S. schulzi* labeled: "No.166/Pará/ 23-3 93." One specimen lacks the gaster, but is otherwise similar to its mate in all respects: TL 1.8, HL 0.50, HW 0.37 (CI 74), ML 0.09 (MI 18), WL 0.50 mm. The types are conspecific with the Costa Rican specimen that I surmised might belong to this species in 1953 (p. 108). Also belonging to this species are workers examined from Mexico: Finca Monte Libano, Ocosingo Valley, Chiapas, sweeping vegetation (C. and M. Goodnight and L. J. Stannard); Pueblo Nuevo, near Tetzonapa, Veracruz, with dealate female (E. O. Wilson leg., No. 161), rain forest, under bark of large (2 m diameter) rotten log with wood still hard.

INDETERMINATE FORMS OF SMITHISTRUMA

Smithistruma sp. near **pilinasis**

In 1953, I noted (P. 57) the presence, in east-central Illinois, of specimens which appeared to be "intergrades" between *S. pilinasis* and *S. laevinasis* in the thickness and orientation of the pilosity, particularly that of the clypeus. The specimens from Danville and Urbana, Illinois, described in 1953 (pp. 60-61) as belonging to this category, have been augmented by two collections from the same state: Karber's Ridge, forest debris (M. W. Sanderson and L. J. Stannard leg.); Eddyville, Pope Co., in rotten log (H. H. Ross and L. J. Stannard leg.). Another worker specimen of the intermediate type comes from oak-hardwood forest near Franklin, Macon Co., North Carolina, at about 700 m altitude, from leaf mold at the base of a rotten stump (W. G. Carter leg.). These intermediate forms can still be distinguished from both *pilinasis* and *laevinasis*, but despite their small numbers, they show tendencies more or less favoring one or the other of the "parent" forms. Whether they represent a separate species, a set of hybrids, or a frequent mutant, or perhaps even part of the variation of a character-displacement situation, we cannot say without more material, especially from outside Illinois. Certainly, *pilinasis* and *laevinasis* are very close to one another, and they have deeply interpenetrating ranges. It may be significant that *S. clypeata* has not yet been taken at precisely the same localities as *S. pilinasis*, but has been collected sympatrically with *S. laevinasis*.

Smithistruma sp. near **missouriensis**

In my 1953 revision (p. 90) I described a puzzling variant under the discussion of *S. abdita*. This variant looked something like *S. abdita*, but was a little smaller, with shorter mandibles, less abundant clypeal hairs, and differed in other details of pilosity. One series, from Turkey Run State Park, Indiana, was badly depilated and scarcely worth studying, while the other was mixed in the same vial with a series of *abdita* from Catawba Beach, Ohio. Several samples of this form have now come in from Illinois, and it now seems clear that it is distinct from *abdita*. It is tempting to consider this form a new species, since

the samples available show little variation one from another, and specimens are usually easy to recognize. The Illinois samples consist of from one to three workers each: Oquawka (Mills and Stannard leg.); Meredosia (Sanderson and Stannard leg.); Woodford (G. C. Decker leg.); Liberty, Adams Co. (Stannard leg.).

The temptation to recognize this form as a new species is cooled by the circumstance that certain specimens, at present referred to *S. missouriensis* (slender-mandibulate variant), show an approach to it in clypeal form and pilosity, as well as mandible form. Otherwise, this form and *missouriensis* show many striking similarities in the sculpture and pilosity of the head and other characters, and there is no doubt that they are closely related, if not conspecific. These possibly intermediate forms come from the Sag Canal Area, Cook Co., Illinois (C. Seevers and H. Dybas leg.), and from Ames, Iowa (W. F. Buren leg.); at the last locality, *S. missouriensis* seems to be unusually variable for a single locality sampled. The problem of the *abdita*-like form thus is a part of the problem of *S. missouriensis*, and can only be settled by the study of more material of this complex.

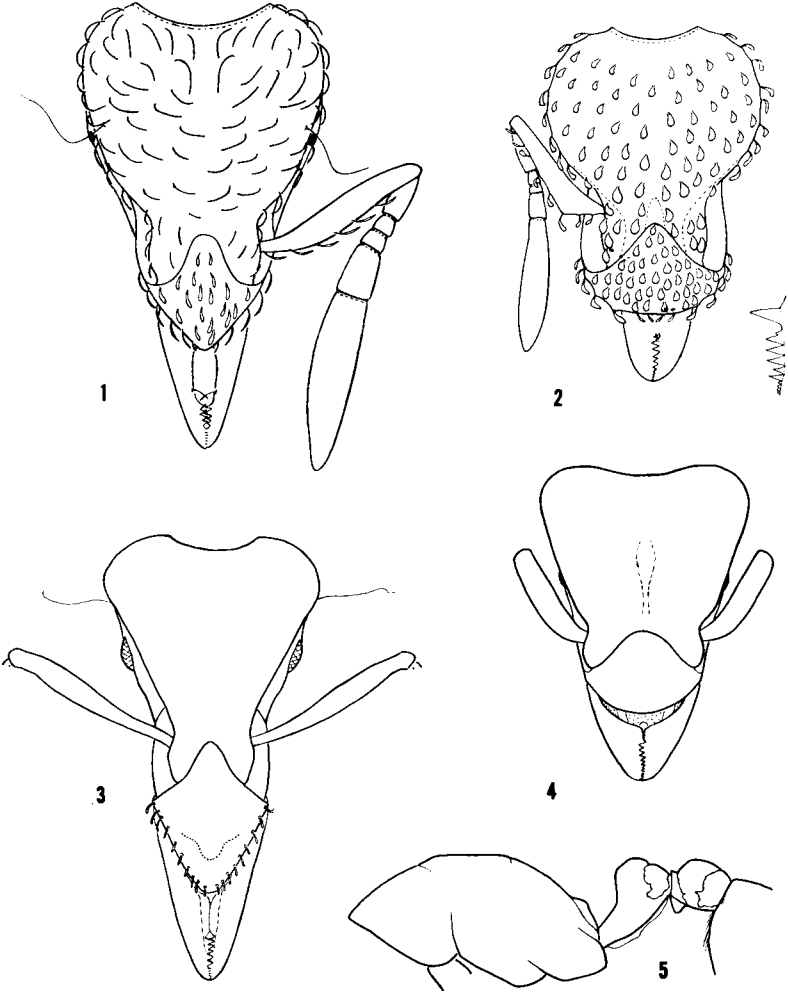
EXPLANATION OF FIGURES

PLATE XVI

New species of *Smithistruma*, holotype workers

- Fig. 1.—*S. tanymastax*, full-face view of head and mandibles.
 Fig. 2.—*S. carolinensis*, same.
 Fig. 3.—*S. probatrix*, same, most of pilosity omitted.
 Fig. 4.—*S. kyidriiformis*, same, pilosity omitted.
 Fig. 5.—*S. kyidriiformis*, lateral view of alitrunk, petiole, postpetiole, and gaster pilosity omitted.

Figures not drawn to same scale.



BROWN: GENUS SMITHISTRUMA