SUPPLEMENTARY STUDIES ON ANT LARVAE: PONERINAE, MYRMICINAE AND FORMICINAE

BY
George C. Wheeler
and
Jeanette Wheeler

From the Transactions of the American Entomological Society
Volume 106: 527-545

Issued December 31, 1980 1488

SUPPLEMENTARY STUDIES ON ANT LARVAE: PONERINAE, MYRMICINAE AND FORMICINAE

GEORGE C. WHEELER
and
JEANETTE WHEELER

Desert Research Institute
University of Nevada System
Reno 89506

ABSTRACT

The larvae of 14 species of ants in the genera **Acantholepis*, *Acropyga*, **Antichthonidris*, *Basiceros*, **Cataglyphis*, **Eutetramorium*, **Melissotarsus*, *Mystrium*, **Nothidris*, *Odontomachus*, *Oxyepoecus*, **Petalomyrmex* and **Terataner* are described. The genera marked with an asterisk are characterized for the first time. The genera are added to our 1976 key and a specialization index is given for each genus.

INTRODUCTION

In the short interval between the publication of our first supplementary studies (1976a and 1977) other myrmecologists have added 14 species to our collection. These species are in 13 genera, 8 of which had not been represented previously in our material. This paper reports on these taxa.

The terms describing profile and mandible shape and the index of specialization are explained in our 1976b monograph. All citations are to our own publications and are given by date and page only.

Subfamily Ponerinae

TRIBE AMBLYOPONINI

Genus MYSTRIUM Roger

Revised Characterization. — Profile pogonomyrmecoid. Body hairs abundant and unbranched. No hairs on head. Mandible ectatommoid, medial teeth present or absent.

In our 1976b key this genus would be under profile 1. Pogonomyrmecoid and would run to rubric 13a with *Stigmatomma* from which we are unable to distinguish it.

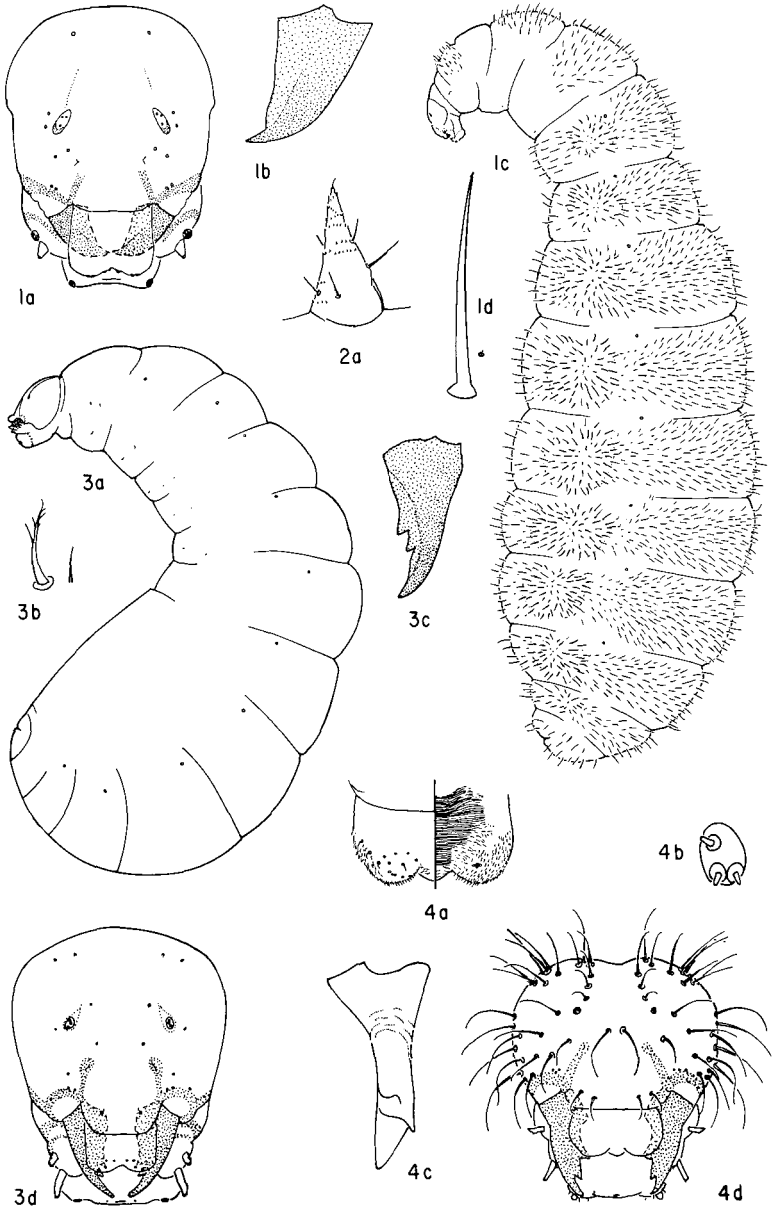
The specialization index of the genus is 14.

Mystrium mysticum Roger

Fig. 1. Length (through spiracles) about 6.1 mm. Profile pogonomyrmecoid except posterior end narrowly rounded; anus terminal, head small and on anterior end. Leg and gonopod vestiges present. Lateral longitudinal welt well developed on abdomen. Thirteen differentiated somites. Ten pairs of spiracles; those on thorax rudimentary; abdominal spiracular walls about 0.019 mm in diameter; atrial wall with short rows of minute spinules; atrial and tracheal openings about 0.004 mm in diameter. Entire integument spinulose, the spinules minute and in short rows, especially numerous on venter of thorax and dorsum of posterior somites. Body hairs sparse on dorsum of thorax, none on venter; moderately numerous on abdomen; 0.003-0.1 mm long, simple. Cranium slightly longer than broad; broadly subpyriform. Antennae slightly below midlength of cranium; small, teardrop-shaped, with 3 minute sensilla, each of which bears a minute spinule. Head without hairs; integument with about 16 sensilla. Labrum bilobed; anterior surface of each lobe with about 10 sensilla (half with a minute spinule each, the remainder encapsulated); ventral border of each lobe with 1 isolated and 4 contiguous sensilla; posterior surface with 4 sensilla ventrolaterally and minute spinules in short rows medially. Mandible ectatommoid, but without medial teeth; heavily sclerotized. Maxilla paraboloidal, apex with numerous minute spinules in short transverse rows; palp short and stout with 5 sensilla (1 with a digitiform projection, 2 encapsulated and 2 with a spinule each); galea a slender frustum with 2 apical sensilla. Labium short; anterior surface with numerous minute spinules in short transverse rows; palp a low knob with 5 (1 with a digitiform projection, 2 encapsulated and 2 with a spinule each) sensilla; opening of sericteries a slit on the anterior surface. Hypopharynx sparsely spinulose, the spinules minute and in short transverse rows.

Submature Larva. — Length about 2.6 mm. Similar to mature larva except as follows. Body hairs 0.001-0.04 mm long, on dorsum of thorax and AI, up to 0.06 mm long on AII-AV and more numerous. Galea a low knob with 2 sensilla.

FIGURES 1-4: 1. *Mystrium mysticum.* a, Head in anterior view, X92; b, left mandible in anterior view, X185; c, larva in side view, X20; d, 2 body hairs, X369. 2. *Odontomachus simillimus.* a, Typical tubercle on young larva, X39. 3. *Eutetramorium mocquerysi* a, Larva in side view, X16; b, 2 types of body hairs, X185; c, left mandible in anterior view, X110; d, head in anterior view, X40. 4. *Basiceros singularis.* a. Labrum: left side in anterior view, right side in posterior view, X70; b, left antenna in anterior view, X513; c, left mandible in medial view, X58; d, head in anterior view, X42.


1a
1b
1c
1d
2a
3a
3b
3c
3d
4a
4b
4c
4d

Young Larva. — Length about 2 mm. Similar to mature larva except as follows. Entire integument spinulose, the spinules larger and in short rows on dorsal surface of posterior somites. No body hairs. Galea a low knob with 2 sensilla.

Very Young Larva. — Length about 1.4 mm. Similar to mature larva except as follows. Integument of posterior end with a few minute spinules. No body hairs. Head subcordate. Antenna represented by 3 sensilla. Labrum subrectangular; ventral and lateral borders with 4 sensilla on each half. Mandible feebly sclerotized, narrowly subtriangular; no blade distinguishable. Maxilla with spinules fewer and smaller; palp represented by a cluster of sensilla; galea represented by 2 sensilla. Labial palp represented by a cluster of sensilla.

Material studied: 13 larvae from Andasibé, Madagascar, 1977, #L-47, courtesy of Dr. W.L. Brown.

Tribe Odontomachini
Genus ODONTOMACHUS Latreille
Odontomachus simillimus F. Smith

Mature Larva. — Length (through spiracles) about 7.7 mm. Similar to *O. haematoda* (1952:646) except in the following. Neck not as distinct nor as strongly bent ventrally. With 98 (82 typical, 14 vestigial, paired discs on dorsum of AIV and similar discs on AV) tubercles. Body and head hairs shorter (0.025-0.075 mm long). Labium with spinules short and in rows basally, isolated and larger over most of anterior and lateral surfaces.

Young Larva. — Fig. 2. Length (through spiracles) about 4.2 mm. Similar to mature larvae (above) except as follows. Tubercles 146, distributed thus: 12 on T1, AI-AVIII, 10 on T2, T3 and AIX, 6 on AX, in addition on AIV there is a middorsal swelling, a similar area on AV. Head and body hairs shorter (0.013-0.025 mm long). Mandible rather feebly sclerotized, teeth closer together and more sharp-pointed, spinules smaller. Maxilla with smaller spinules; palp shorter. Labium with smaller spinules; palp a low knob; opening of sericteries on a slightly raised boss. Hypopharynx with smaller spinules.

On the 3 mature larvae there is a planidium attached to the membrane between T1 and T2 on each of the 2 specimen, on 1 there is a planidium attached at the base of the ventrolateral tubercle on T1 and 1 attached on the membrane between T2 and T3. There are no planidia on the young larvae.

Material studied: 5 larvae from South Celebes, 10 July 1972, Andrang Forest, 4 km W Batukaropa, 200 m, N-8, courtesy of Dr. W.L. Brown.

Subfamily Myrmicinae
Tribe Melissotarsini
Genus MELISSOTARSUS Emery

Profile rhopalomastigoid, stout. Hairs very sparse. Of 2 types: (1) short, slender, unbranched; (2) long, slightly curved, with very small anchor-tip. Cranium subhex-

agonal. Head hairs few. Labrum small and trilobed. Mandible dolichoderoid. Maxilla with conspicuous anteroventral spike-like hairs; palp represented by 2 sensilla (each bearing a spinule) and a median projection with a bifid tip; galea represented by 2 sensilla (each bearing a spinule). Labium small, rounded and with conspicuous anteroventral spike-like hairs; palp represented by 2 sensilla.

In our 1976b key this genus would be under Profile 12. Rhopalomastigoid and would require a new rubric:

1a. Mandible pogonomyrmecoid ..... *Rhopalomastix* in Melissotarsini

1b. Mandible dolichoderoid ..... *Melissotarsus* in Melissotarsini

The specialization index is 33.

Melissotarsus titubans Delage

Fig. 6. Length (through spiracles) about 2 mm. Profile rhopalomastigoid; anus on ventral surface of posterior knob. Leg and wing vestiges present. All somites distinct. Spiracles small (about 0.008 mm in diameter); atrial and tracheal openings about same diameter (about 0.003 mm); atrial wall simple. Entire integument with coarse spinules arranged in short rows, rows transverse or forming reticulate patterns. Body hairs very sparse. Of 2 types: (1) 0.0125-0.05 mm long, unbranched, slender, more numerous on ventral and ventrolateral surfaces; (2) 0.1-0.3 mm long, longest of T1, decreasing in length posteriorly, 3 pairs on T1, a pair each on dorsolateral surfaces of T2-AVI; hairs stout at base, tapering to a very small anchor-tip; shaft slightly curved. Head large; cranium subhexagonal; integument spinulose, the spinules isolated dorsally and in short rows ventrally; coarse and numerous on ventral portion of clypeus. Antenna large; just below middle of head length; with 3 (rarely 2) sensilla, each bearing a spinule. Head hairs few (about 20), about 0.013 mm long, unbranched. Labrum trilobed, small; anterior surface with about 8 minute (about 0.009 mm long) hairs; coarsely spinulose; ventral border with spinules more numerous and smaller; posterior surface with about 10 sensilla. Mandible heavily sclerotized; dolichoderoid. Maxilla swollen laterally; apex appearing adnate; integument with coarse spinules laterally; anterior surface with about 5 coarse spike-like hairs (about 0.019 mm long) directed anteriorly; palp represented by 2 sensilla (each with a coarse spinule) and a medial projection with a bifid tip; galea represented by 2 sensilla, each bearing a coarse spinule. Labium small and rounded, with about 10 coarse spike-like hairs on ventral border, curved anteriorly; ventral and lateral borders coarsely spinulose; palp represented by 2 sensilla (each bearing a spinule) and with a pigmented area between them; an isolated sensillum between each palp and the opening of the sericterise; the latter an inconspicuous slit high on the labium. (Material studied: 12 larvae and 7 semipupae from Ivory Coast, Lamto Field Station, 15 January 1976, #P-64, courtesy of Dr. W.L. Brown.)

Tribe Solenopsidini
Genus ANTICHTHONIDRIS Snelling

Profile pheidoloid, but more slender. Body hairs moderately numerous. Head feebly cordate. Antenna large. Head hairs long and whip-like. Mandible ectatommoid, a few denticles on edge of blade. Galea and palp subequal in length. Labium feebly trilobed.

In our 1976b key this genus would be under Profile 2. Pheidoloid and would run to 10b with the other genera in Tribe Solenopsidini.

The index of specialization is 14.

Antichthonidris denticulatus (Mayr)

Fig. 7. Length (through spiracles) about 4.4 mm. Profile pheidoloid. Spiracle on T2 about 0.018 mm in diameter, decreasing in size posteriorly; atrial and tracheal openings about 0.004 mm in diameter; atrial walls with minute spinules. Ventral surface of T1-T3 and AI and dorsal surface of AV-AX with minute spinules in short transverse rows. Body hairs moderately numerous. Of 3 types: (1) 0.05-0.25 mm long, slender and whip-like, on all somites except AX; (2) 0.013-0.06 mm long, few, stout, with multifid tip, on AX; (3) about 0.175 mm long, very few, anchor-tipped, on AIX. Head feebly cordate, slightly wider than long. Antenna large, 3 sensilla mounted on a distinct knob, set on a circular base. Head hairs few, long (0.075-0.15 mm), unbranched and whip-like. Labrum narrow and bilobed; each half of anterior surface with 6 (2 encapsulated and 4 with a spinule each) sensilla and with spinules near ventral and lateral surfaces, ventral border with moderately numerous rather coarse spinules; posterior surface sparsely spinulose, the spinules rather coarse and isolated, and with 1-3 sensilla dorsally. Mandible ectatommoid, with a few denticles on edge of blade. Maxilla with apex paraboloidal, palp a skewed peg with 5 (4 apical and encapsulated and 1 subapical and bearing a spinule) sensilla; galea about same length as palp, a short peg with 2 apical sensilla. Labium feebly trilobed; sparsely spinulose; anterior surface with minute spinules in short transverse rows medially, spinules larger and isolated laterally; palp a low knob with 5 (4 apical and encapsulated and 1 lateral and bearing a spinule) sensilla; an isolated sensillum between each palp and opening of sericteries; the latter a narrow transverse slit on ventral border. Hypopharynx sparsely spinulose, the spinules minute and isolated or in short transverse rows.

Very Young Larva. — Length (through spiracles) 1.8-2 mm. Integument with few minute spinules in short transverse rows on ventral surface of anterior somites, decreasing posteriorly on abdomen, on all surfaces of AX, on dorsal surface of remainder and decreasing in number anteriorly. Body hairs (1) 0.125-0.225 mm; (2) about 0.038 mm; (3) about 0.1 mm. Antenna a very low knob. Head hairs 0.088-0.15 mm long. Ventral border of labium rounded. Otherwise similar to mature larva.

Material studied: a dozen larvae and semipupae from: Volcan Villarica (nr Pacon), Prov. Cautin, Chile, 19 Dec. 1972, coll. J.H. Hunt #1067, courtesy of R.R. Snelling.

Antichthonidris bidentatus (Mayr)

Length (through spiracles) about 2.8 mm. Very similar to mature *A. denticulatus* except in the following details. T2 spiracle about 0.02 mm in diameter, remainder about 0.013 mm. Only first 2 types of body hairs: (1) about 0.175 mm long; (2) 0.013-0.06 mm long. Head hairs 0.05-0.15 mm long. Antennal knob slightly lower. (Material studied: 5 larvae and semipupae from: 20 km E Temuco, Prov. Cautin, Chile. 8 I 1951, coll. Ross and Michlhacher, courtesy of R.R. Snelling.)

Genus NOTHIDRIS Ettershank

Profile attoid but with ventral profile straight and anterior end formed from dorsa of pro- and mesothorax. Body hairs sparse ventrally and moderately numerous dorsally. Of 2 types: (1) deeply bifid, branches flexuous, on dorsal and lateral surfaces; (2) unbranched and flexuous, on ventral surface. Head hairs similar to body hairs, moderately numerous. Few spinules on mouth parts. Labrum subrectangular. Mandible ectatommoid, with slender apical tooth; medial tooth stouter. Maxilla with galea shorter than palp.

In our 1976b key this genus would be under Profile 4 Attoid and would require a new rubric: 1c. Mandibles ectatommoid.

The index of specialization is 26.

Nothidris latastei (Emery)

Fig. 9. Length (through spiracles) about 3.6 mm. Attoid, but with ventral profile straight and anterior end formed from dorsa of T1 and T2. Leg and wing vestiges present. About 5 distinct somites. Ten pairs of spiracles, those on T2 largest (about 0.018 mm in diameter, atrial and tracheal openings about 0.006 mm), diameter decreasing slightly posteriorly. Integument without spinules. Body hairs of 2 types; (1) moderately numerous, 0.038-0.125 mm long, deeply bifid, branches flexuous, on dorsal and lateral surfaces, except very few on AX; (2) very few, 0.013-0.088 mm long, unbranched, stout to slender, flexuous, limited to ventral surface, except on all surfaces of AX. Cranium transversely subelliptical. Antenna small, with 3 sensilla on a slightly raised base. Head hairs moderately numerous. Of 2 types: (1) bifid, 0.05-0.113 mm long, near dorsal and lateral margins; (2) unbranched, 0.056-0.113 mm long, on clypeus and lower portion of vertex. Labrum subrectangular, ventral border feebly concave; without spinules; anterior surface with about 8 hairs (about 0.006 mm long); posterior surface with 3 isolated sensilla dorsally and 3 contiguous sensilla ventrally on each half. Mandible stout, ectatammoid; apical tooth slender, subapical tooth stout. Maxilla with apex paraboloidal and with a few minute spinules in short rows; palp a frustum with 5 (2 encapsulated and 3 with a spinule each) apical sensilla; galea smaller, directed medially, with 2 apical sensilla, each bearing a spinule. Labium without spinules; palp a low knob with 5 (with a spinule each) sensilla; an isolated sensillum between each palp and the

opening of the sericteries; the latter a narrow transverse slit. No spinules seen on hypopharynx. (Material studied: 4 larvae collected by J.H. Hunt #1045, 14 XII 1972, Chile, Prov. Mollese, Parques Nec. Nahuelbta, courtesy of R.R. Snelling.)

Genus OXYEPOECUS Santschi

Oxyepoecus rastratus (Mayr)

Fig. 8. Length (through spiracles) about 1.8 mm. Similar to *Oxyepoecus* sp. (1973:32) except as follows: Body hairs slightly longer (0.038-0.08 mm long). Head hairs 0.025-0.05 mm long, tip branched. Mandible with teeth slightly stouter. (Material studied: numerous larvae from Brazil, Estado São Paulo, Jardim Botanico (Aqua Funda), R-218; 4 from Brazil, São Paulo, Boracela Biol. Sta., Mun. Salesópolis, 850 m, H-232, both courtesy of Dr. W.L. Brown.)

Tribe Myrmecinini

Genus TERATANER Emery

Profile pogonomyrmecoid but straighter and more slender. Body hairs abundant except on posterior end, which is almost naked. Of 3 types: (1) minute to small, tip many-branched to tip denticulate; (2) a few longer, with distal portion denticulate; (3) anchor-tipped, 6 per somite, on dorsum of AI-AVIII. No spinules on mouth parts. Mandible ectatommoid.

In our 1976b key this genus would be under Profile 1. Pogonomyrmecoid. It would run to 11, which should be changed to read:

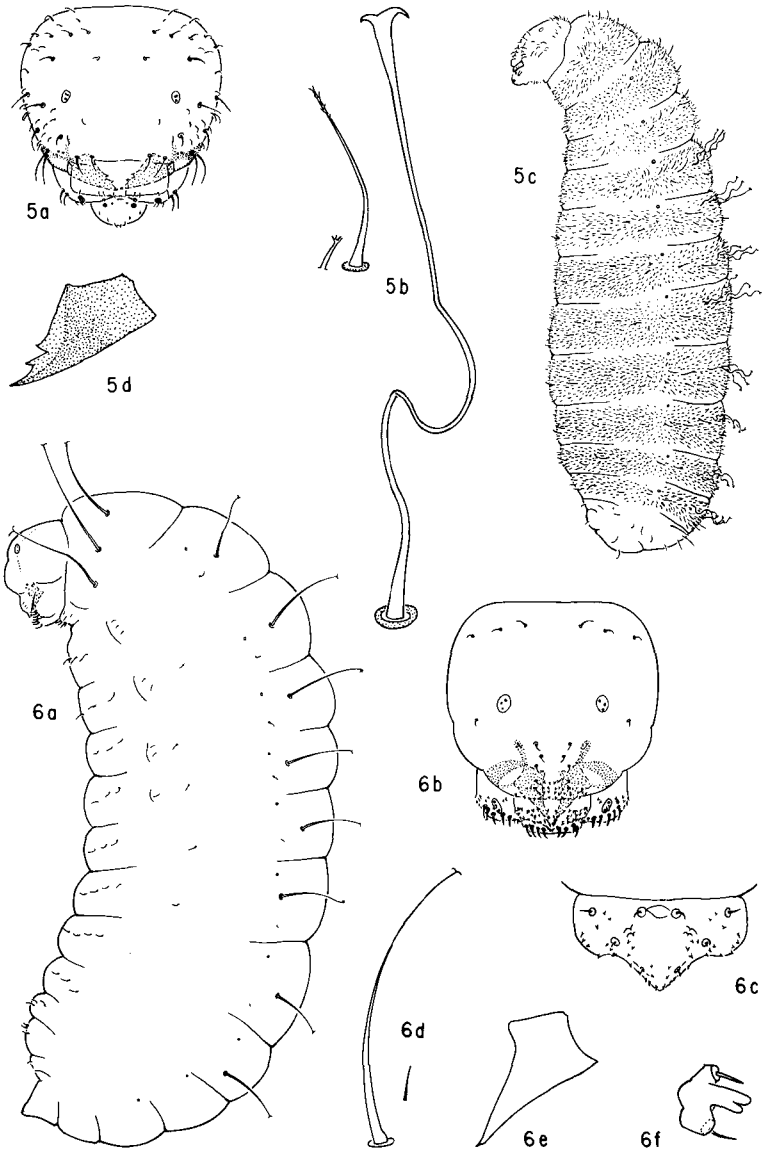
11a. Labrum very broad (breadth 3 times length); gena bulging..... ..... *Dilobocondyla* in Myrmecinini

11b. Labrum very broad (breadth 3 times length); gena not bulging .... *Terataner* in Myrmicinini

11c. Like neither of the above ..... *Myrmica* in Myrmicini and *Leptothorax (Mychothorax* and *Nesomyrmex)* in Leptothoracini

The specialization index is 20.

Figures 5-6: 5. *Terataner alluaudi.* a, Head in anterior view, X36; b, 3 types of body hairs, X121; c, larva in side view, X6; d, left mandible in anterior view, X96. 6. *Melissotarsus titubans.* a, Larva in side view, X51; b, head in anterior view, X113; c, labrum in anterior view, X289; d, 2 types of body hairs, X121; e, left mandible in anterior view, X260; f, left maxillary palp in medial view, X519.


5a
5b
5c
5d
6a
6b
6c
6d
6e
6f

Terataner alluaudi (Emery)

Fig. 5. Length (through spiracles) 6.9-7.2 mm. Profile pogonomyrmecoid but straighter and more slender. Anus posteroventral, with an anterior lip. Head large and on anterior end. Leg and wing vestiges present. About 8 distinct somites. Ten pairs of spiracles, those on T2, T3 and AI about 0.04 mm in diameter, remainder decreasing slightly posteriorly; atrial and tracheal openings about 0.005 mm, peritreme feebly sclerotized. Integrument on posterior somites with minute spinules, isolated or in short rows. Body hairs numerous, except few on AIX and AX. Of 3 types: (1) on all surfaces of all somites, except very few and minute on AIX and AX, 0.013-0.035 mm long, tip many-branched or tip with many short denticles, without alveolus and articular membrane; (2) 0.013-0.35 mm long, distal portion denticulate, 20-40 per somite, with alveolus and articular membrane; (3) about 0.84 mm long, anchor-tipped, 6 per somite, on dorsum of AI-AVIII. Cranium transversely subelliptical. Antenna minute, with 3 sensilla, each bearing a minute spinule; below middle of head length. Head hairs 0.013-0.125 mm long, unbranched, with tip finely denticulate, moderately numerous. No spinules on mouth parts. Labrum rectangular, width 3 times length; anterior surface of each half with about 4 hairs, 0.013-0.025 mm long, near ventral border, with 5 sensilla on ventral surface; posterior surface with 3-6 sensilla near middle. Mandible moderately sclerotized; ectatommoid with 2 medial teeth. Maxilla with apex narrowly paraboloidal; palp a short peg with 5 sensilla; galea smaller than palp, a very small knob with 2 apical sensilla. Labium small and rounded; palp a small knob with 5 sensilla; an isolated sensillum between each palp and opening of sericteries; the latter a small slit on anterior surface.

Very Young Larva. — Length about 3.3 mm. Integument with large spinules on all surfaces of T1 and AVII-AX, smaller and on dorsal surface of other somites. Body hairs at or above level of spiracles except on all surfaces of T1; (1) 0.013-0.04 mm long, on venter of T1, on dorsum of each somite T2-AVII; (2) 0.025-0.11 mm long, about 12 on T1, 14 on T2, 10 on T3, 4 on each AI-AVI; (3) about 0.15 mm long, 6 each on AI-AVI, 4 on AVII. Head very large. Head hairs few (about 22), 0.03-0.09 mm long. Labrum width 2-1/2 times length. Mandible with apex more sharp-pointed and blade narrower. Otherwise as in mature larva.

Material studied: 21 larvae from Madagascar, ca 5 km S Sambava, 16 Feb. 1977, F-70, courtesy of Dr. W.L. Brown.

Tribe Tetramoriini

Genus EUTETRAMORIUM Emery

Profile pogonomyrmecoid. Body hairs very few, minute with unbranched to many-branched tip. Ventral portion of clypeus roughened with isolated spinules. Head without hairs. Labrum with anterior surface spinulose. Mandible ectatommoid. Galea digitiform and slightly bent.

In our 1976b key this genus would be under Profile 1. Pogonomyrmecoid and would run to 13a. Head without hairs. Larvae of *Eutetramorium* can be distinguished from those of *Stigmatomma* by longer (0.05-0.2 mm long), abundant and

uniformly distributed body hairs in *Stigmatomma;* in *Eutetramorium* the body hairs are minute (0.013-0.06 mm long) and very few.

The index of specialization is 11.

Eutetramorium mocquerysi Emery

Fig. 3. Length (through spiracles) about 8.3 mm. Profile pogonomyrmecoid. Anus ventral. Leg and wing vestiges present. About 8 differentiated somites. Ten spiracles present; 0.025 mm in diameter; atrial and tracheal openings about 0.006 mm in diameter; atrial wall with minute spinules in short rows. Entire integument spinulose, the spinules minute and in rows ventrally. Body hairs minute (0.013-0.06 mm long), very few, tip unbranched to many-branched. Cranium subheptagonal; ventral portion of clypeus roughened with isolated spinules. Antenna small, mounted on a teardrop-shaped base; with 3 sensilla each bearing a spinule. No head hairs, but about 20 sensilla, each with a very small spinule. Labrum narrow, bilobed; anterior surface roughened with spinules (similar to those on clypeus); each half of anterior surface with about 4 sensilla; ventral surface spinulose and with 3 sensilla; posterior surface spinulose, most spinules isolated, a few in short arcuate rows. Mandible moderately sclerotized; ectatommoid, with 2 medial teeth. Maxilla with apex paraboloidal; entire integument roughened with spinules; palp a stout peg with 5 (4 apical and encapsulated and 1 lateral and bearing a spinule) sensilla; galea digitiform but bent, with 2 apical sensilla. Labium wide; densely spinulose, the spinules isolated or in short rows; palp a slightly elevated cluster of 5 (4 encapsulated and 1 with a spinule) sensilla; an isolated sensillum between each palp and opening of sericteries; the latter a small transverse slit. Hypopharynx spinulose, the spinules minute and in short transverse rows laterally.

Very Young Larva (ready to molt). — Length (through spiracles) about 3.3 mm. Body hairs minute (0.013-0.075 mm long), very few and all unbranched, longer hairs stout. Mandible with apical and subapical teeth more sharp-pointed, basal tooth short and blunt. Maxillary palp and galea shorter. Otherwise similar to mature larva.

Young Larva (= integument beneath integument described above). — Body hairs 0.006-0.05 mm long, shaped as in mature larva. Entire integument spinulose, the spinules sparse and minute. Otherwise as in mature larva.

Material studied: 7 larvae and 4 semipupae from Madagascar, 84 km SW Sambava, 160 m, 17-II, courtesy of Dr. W.L. Brown.

Tribe Basicerotini

Genus BASICEROS Schulz

Basiceros singularis (F. Smith)

Fig. 4. Length (through spiracles) about 6.6 mm. Very similar to *Basicros* sp. (1977:599) except as follows: Type 3 body hairs less distinctly uncinate and with more denticles. Cranium strongly subcordate, integument minutely spinulose. Labrum trilobed, each lateral lobe with 5 or 6 minute hairs (about 0.013 mm long), 6

sensilla; ventral and lateral surfaces densely spinulose, spinules rather long and in short rows; anterior surface of middle lobe with minute spinules in short transverse rows; middle of posterior surface of each lateral lobe with a cluster of 4 sensilla; middle 2/3 of entire posterior surface densely spinulose, spinules short and in numerous transverse rows; lateral 1/6 with spinules much longer and isolated.

Young Larva. — Length (through spiracles) about 4.8 mm. Neck composed of thorax and AI, strongly curved ventrally and distinctly narrower than remainder of body. Anus with posterior lip. About 6 distinct somites. Otherwise as in the mature larva.

Material studied: 7 larvae from Brazil, Mato Grosso, Faz. Junqueira Vilela, Munic. Diamantino, 3 km E casa, 17-18 July 1973, courtesy of Dr. W.L. Brown.

Subfamily Formicinae
Tribe Formicini
Genus CATAGLYPHIS Foerster

Profile pogonomyrmecoid, abdomen somewhat swollen but with ventral profile nearly straight. Body hairs short, numerous. Of 2 types: (1) unbranched; (2) 2- to 4-branched, branches short to moderately long. Head hairs short, moderately numerous and unbranched. Labrum bilobed; chiloscleres lacking; a narrow transverse sclerotized band near base of labrum. Mandible camponotoid. Opening of sericteries wide and with a large median projection.

In our 1976b key this genus runs to couplet 27b with the remainder of the tribe Formicini.

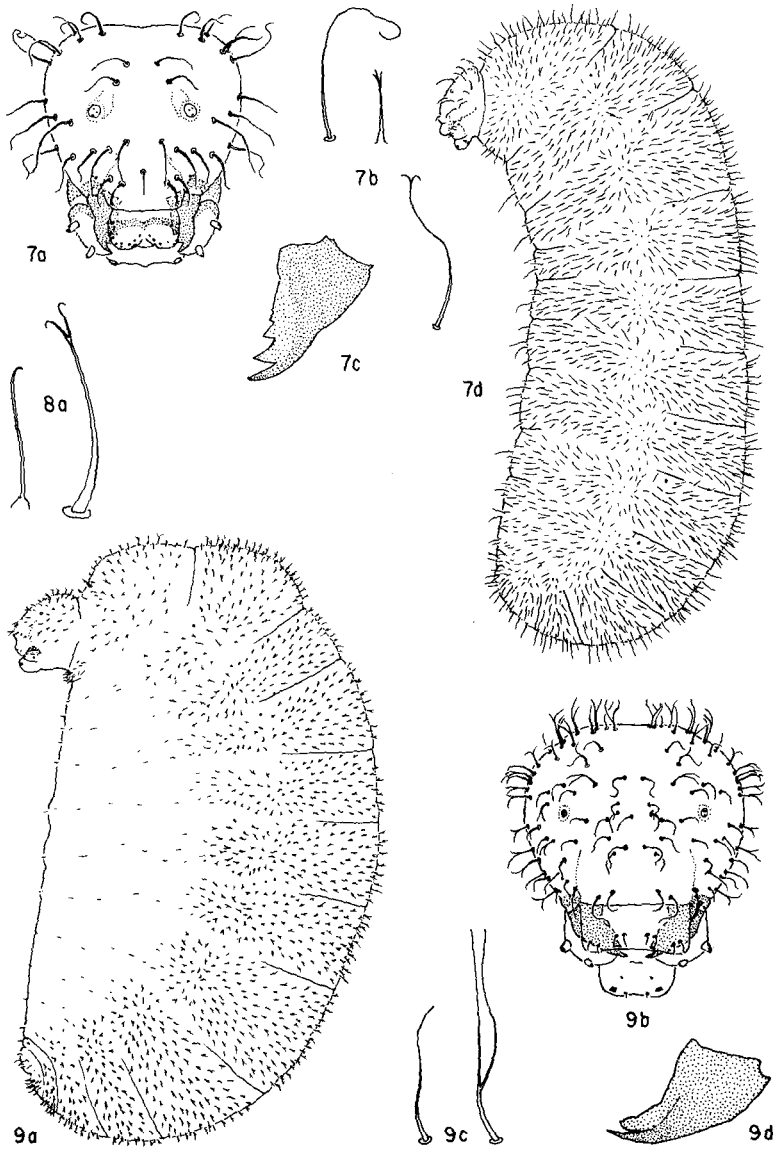
The specialization index is 15.

Cataglyphis bicolor (Fabricius)

Fig. 10. Length (through spiracles) about 10 mm. Profile pogonomyrmecoid; lateral longitudinal welt well developed on abdomen; head small; T1 divided into 2 portions — the anterior smaller, wedge-shaped, wider ventrally. Leg, wing and gonopod vestiges present. Somites distinct. Spiracles on T2, T3 and AI subequal and slightly larger than remainder which are subequal; T2 atrial wall about 0.038 mm in diameter; atrial opening 0.008 mm, tracheal opening about 0.015 mm. Integument spinulose, venter of thorax and all surfaces of posterior somites with minute spinules

---

Figures 7-9: 7. *Antichthonidris denticulatus.* a, head in anterior view, X73; b, 3 types of body hairs, X145; c, left mandible in anterior view, X185; d, larva in side view, X27. 8. *Oxyepoecus rastratus.* a, Two types of body hairs, X369. 9. *Nothidris latastei.* a, Larva in side view, X30; b, head in anterior view, X92; c, 2 types of body hairs, X291; d, left mandible in anterior view, X146.


7a
7b
7c
7d
8a
9a
9b
9c
9d

in short transverse rows; elsewhere spinules isolated and minute. Body hairs short and moderately numerous. Of 2 types: (1) 0.025-0.15 mm long, unbranched; (2) 0.05-0.15 mm long, 2-4 branched, branches short to long. Cranium subcircular; integument rugose; with an inverted sclerotized V from the occiput toward antennae. Antenna small, with 2-4 sensilla, each bearing a distinct spinule. Head hairs unbranched, moderately numerous, short (0.015-0.04 mm long). Labrum with a narrow transverse sclerotized band near base; bilobed; integument granulose; each lobe with 4 sensilla, each bearing a spinule, and 7 encapsulated sensilla; posterior surface with about 5 sensilla medially; entire posterior surface densely spinulose, the spinules minute and in numerous subtransverse rows, the rows grouped in 2 subtriangles which have their bases near the middle. Mandibles camponotoid. Integument of maxilla densely granulose; apex broadly conoidal; palp a small irregular peg with 5 (2 encapsulated and 3 with a spinule each) apical sensilla; galea small, digitiform, with 2 apical sensilla, each bearing a spinule. Labium with integument granulose; palp a short knob with 5 (2 encapsulated and 3 with a spinule each) apical sensilla; opening of sericteries wide and salient, with a large median projection. Hypopharynx densely spinulose, the spinules minute and arranged in subtransverse rows, the rows grouped in 2 subtriangles which have their bases near the middle.

Very Young Larva. — Length (through spiracles) about 3 mm. Similar to mature larva except as follows. Body hairs all unbranched, minute (0.003-0.025 mm long), sparse, on thorax only. Head hairs minute (about 0.008 mm long). Mandible shape similar to that of mature larva, except with anterior and posterior blades. Maxilla with rounded apex; palp a slightly raised cluster of sensilla; galea a small frustum. Labial palp represented by a cluster of 5 sensilla.

Material studied: 7 larvae from Tunisia, courtesy of Dr. R. Wehner.

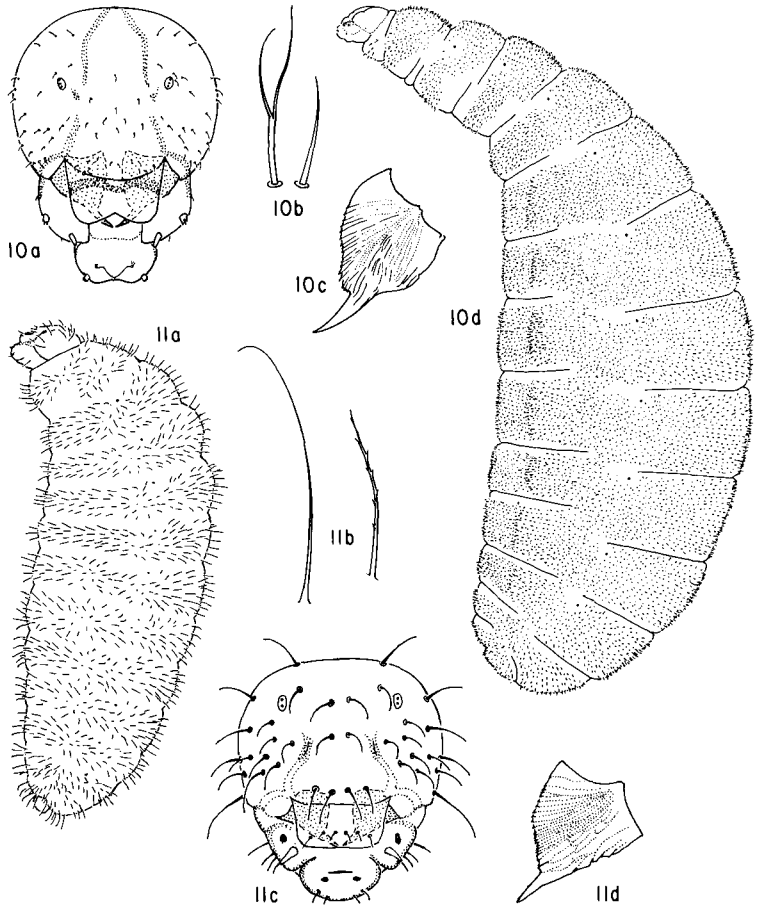
Tribe Plagiolepidini

Genus ACANTHOLEPIS Mayr

Profile oecophylloid but with abdomen narrower posteriorly and anus with protruding lips. Body hairs short and sparse. Of 2 types: (1) unbranched, longest whiplike; (2) unbranched, denticulate. Antennae high on head, small and with 2 sensilla each. Head hairs few; unbranched denticulate. Mandible camponotoid. Maxilla appearing adnate.

In our 1976b key this genus would be under Profile 11. Oecophylloid with *Oecophylla,* from which it can be separated by the narrow posterior end of the body, 2 types of body hairs and the longer head hairs in *Acantholepis.* In *Oecophylla* the posterior end is more rounded; the body hairs are minute, unbranched and mostly on thorax, while the head hairs are short and unbranched.

The specialization index is 17.



FIGURES 10-11: 10. *Cataglyphis bicolor*. a, Head in anterior view, X42: b, 2 body hairs, X202; c, left mandible in anterior view, X81; d, larva in side view, X16. 11. *Acantholepis capensis*. a, larva in side view, X30; b, 2 types of body hairs, X291; c, head in anterior view, X132; d, left mandible in anterior view, X291.

Acantholepis capensis Mayr

Fig. 11. Length (through spiracles) about 2.6 mm. Profile oecophylloid; anus with protruding lips; head large. Leg, wing and gonopod vestiges present. About 10 differentiated somites. Body hairs moderately abundant. Of 2 types: (1) 0.025-0.2 mm long, unbranched, longest slender and whip-like; (2) 0.038-0.075 mm long, stouter and with few minute denticles. Cranium transversely subelliptical. Antennae high on head; small; with 2 sensilla each. Head hairs 0.038-0.075 mm long, few, unbranched, with minute denticles along shaft. Labrum subrectangular; anterior surface with about 6 hairs (0.019-0.038 mm long) and 2 sensilla; posterior surface densely spinulose, the spinules minute and in short rows, the rows radiating from the dorsolateral angles. Mandible camponotoid; apical tooth straight and about 0.1 length of mandible; anterior surface with numerous longitudinal ridges. Maxilla appearing adnate; palp an irregular knob with 5 (2 encapsulated and 3 with a spinule each) sensilla; galea digitiform and with 2 apical sensilla, each bearing a spinule. Labium small and rounded, anterior surface with minute spinules in a few short transverse rows; palp an irregular knob with 5 (2 encapsulated and 3 with a spinule each) sensilla; opening of sericteries a wide slit on anterior surface. Hypopharynx densely spinulose, the spinules minute and arranged in subtransverse rows, the rows grouped in 2 subtriangles which have their bases near the middle. (Material studied: 10 larvae from South Africa, courtesy of E.V. Gregg and R.E. Gregg.)

Genus ACROPYGA Roger

Revised Characterization. — Profile pogonomyrmecoid, but with thorax and A1 arched ventrally; remainder of body elongate, straight, subcylindrical and rather slender; with pair of ventrolateral bosses on each T1 and AIII-AVI. Body hairs of 2 or 3 types. Mandible camponotoid.

In our 1976b key this genus would be under Profile 1. Pogonomyrmecoid and would key to 27b with other members of the tribe Plagiolepidini.

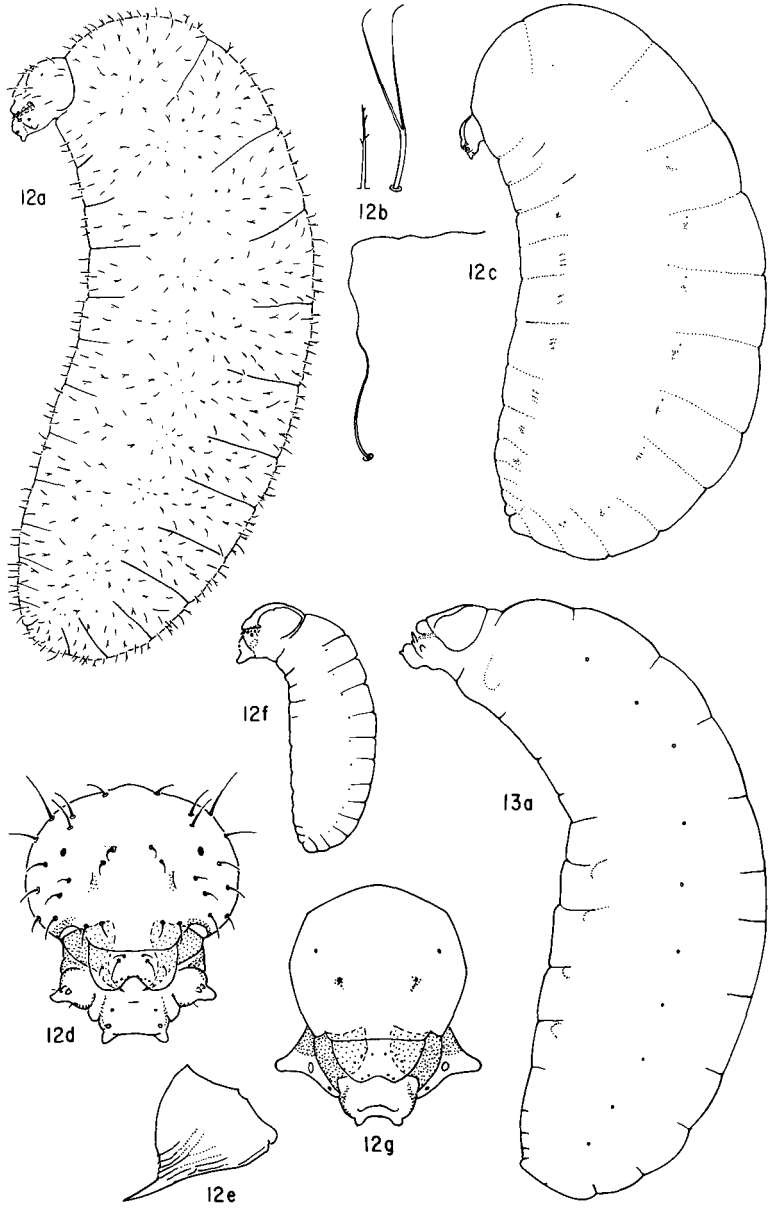
The specialization index is 12.

Acropyga sp.

Mature Larva. — Fig. 13. Length (through spiracles) about 3.4 mm. Similar to *Acropyga moluccana papuana* (1953:136) except as follows: Profile pogonomyrmecoid, but thorax and AI arched ventrally; remainder of body elongate, straight, subcylindrical and rather slender; with a pair of ventrolateral bosses on each T1, AIII-AVI. Body hairs of 2 types; (1) 0.1-0.225 mm long,

---

FIGURES 12-13: 12. *Petalomyrmex phylax.* a, Mature worker larva in side view, X42; b, 3 types of body hairs, X291; c, sexual larva (hairs omitted), X25; d, head of worker larva in anterior view, X132; e, left mandible in anterior view, X316; f, very young larva in side view, X42; g, head of very young larva in anterior view, X132. 13. *Acropyga* sp. a, Larva in side view (hairs omitted), X30.


12a
12b
12c
12d
12e
12f
12g
13a

unbranched and with numerous fine denticles, on all somites; on all surfaces of T1-T3 and AX, most of hairs on AI and AIX; (2) 0.1-0.325 mm long, palmately branched and with 3-9 branches, none on T1-T3 and AIX-AX, few on dorsal surface of AI and AVIII; present on all surfaces of AII-AVII. All head hairs denticulate. Antenna with 2 or 3 sensilla. Mandible camponotoid. Maxilla with apex pointed ventrally; apex with minute spinules in short arcuate rows; palp with 5 (2 apical and encapsulated, 2 apical and with a spinule each, 1 lateral and with a spinule) sensilla. (Material studied: 7 larvae from E. Borneo, 31 km N Balikpapan, 2 June 1972, T7-4, courtesy of Dr. W.L. Brown.)

Tribe Brachymyrmecini
Genus PETALOMYRMEX Snelling

Profile pheidoloid. Body hairs of 3 types; (1) 2-3 branched, on all somites; (2) unbranched with slender whip-like tip, a few on dorsum of each somite; (3) unbranched, some with denticles, on thorax. Cranium with a slight middorsal projection. Antennae very small, with 2 sensilla each. Mandible camponotoid. Maxilla with a conspicuous conoidal protuberance projecting laterally. Labium with a pair of conoidal protuberances projecting ventrolaterally.

In our 1976b key this genus would be under Profile 2. Pheidoloid and would require a new rubric: 2c. Body hairs mostly 2-3 branched; maxilla and labium with conspicuous conoidal protuberances.

The index of specialization is 22. The conoidal protuberances on the maxillae and labium are unique among the ant larvae we have studied.

Petalomyrmex phylax Snelling

Mature Worker Larva. — Fig. 12a-e. Length (through spiracles) about 2.3 mm. Profile pheidoloid; head moderately large and anteroventral. Somites indistinct. Spiracles small (about 0.01 mm in diameter; atrial and tracheal openings about 0.002 mm); walls without spinules. Body hairs sparse. Of 3 types: (1) 0.025-0.125 mm long, 2-3 branched, on all somites; (2) 0.075-0.175 mm long, unbranched, with slender whip-like tip, a few on dorsum of each somite, longer posteriorly; (3) 0.025-0.05 mm long, stout, slightly curved, unbranched or with denticles, on thorax, most numerous on T1. Cranium transversely subelliptical, but with a slight middorsal projection. Antenna high on cranium and very small, with 2 sensilla each. Head hairs few, rather stout, 0.03-0.055 mm long, mostly unbranched, a few with branched tip. Labrum bilobed, each half of anterior surface with 3 hairs about 0.013 mm long and 2 sensilla (with a spinule each), ventral border with minute spinules; posterior surface with 3 sensilla near middle; entire posterior surface densely spinulose, the spinules minute and in rows, the rows subtransverse and radiating from the dorsolateral angles. Mandible camponotoid; anterior surface with subparallel longitudinal ridges; medial surface of basal portion erose; posterior surface with numerous ridges. Maxilla adnate; with a large conoidal protuberance projecting laterally; palp a short peg with 5 (1 apical and encapsulated, 2 apical and with a

spinule each, 2 lateral and with a spinule each) sensilla; galea a frustum with 2 apical sensilla, each with a spinule. Labium with a ventrolateral conoid below each palp; palp a slight elevation with 5 sensilla; an isolated sensillum between each palp and opening of sericteries; the latter a short slit in a slight depression. Hyopoharynx densely spinulose, the spinules arranged in subtransverse rows, the rows grouped in 2 subtriangles, which have their bases near the middle.

Very Young Larva. — Fig. 12f and g. Length (through spiracles) about 0.86 mm. Sausage-shaped, with head on anterior end. Somites feebly distinct. Spiracles minute. No body nor head hairs. Cranium subheptagonal. Antenna minute. Anterior surface of labium lacking hairs. Mandible with apex shorter and more sharp-pointed. Maxilla larger and with lateral conoid larger; palp an irregular knob with 5 sensilla; galea represented by 2 sensilla. Labium with ventrolateral projections smaller; palp smaller. Otherwise as in mature larva.

Sexual Larva. — Length (through spiracles) about 4.7 mm. Similar to worker larva except as follows. Body plumper and head relatively smaller. Leg and wing vestiges more distinct. Integumentary structures of unknown function on intersegmental areas and near each spiracle, also on each ventrolateral surface of AI-AVII. [Body hairs broken.] Mandible more slender. Maxillary projection smaller. Labial projections smaller; palps smaller.

Material studied: 17 larvae from Cameroon, coll. D. McKey, courtesy of R.R. Snelling.

Literature Cited

WHEELER, G.C., AND JEANETTE WHEELER. 1952. The ant larvae of the subfamily Ponerinae. Amer. Midland Natur. 48:111-144; 604-672.

_____. 1953. The ant larvae of the subfamily Formicinae. Ann. Entomol. Soc. Amer. 46:126-171.

_____. 1973. The ant larvae of six tribes: second supplement. J. Georgia Entomol. Soc. 8:27-39.

_____. 1976a. Supplementary studies on ant larvae: Ponerinae. Trans. Amer. Entomol. Soc. 102:41-64.

_____. 1976b. Ant larvae: review and synthesis. Mem. Entomol. Soc. Washington 7:1-108.

_____. 1977. Supplementary studies on ant larvae: Myrmicinae. Trans. Amer. Entomol. Soc. 103:581-602.