
SUPPLEMENTARY STUDIES OF ANT
LARVAE: PONERINAE

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SUPPLEMENTARY STUDIES OF ANT LARVAE: PONERINAE

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ABSTRACT

Larvae in the genera *Mystrium*, *Cryptopone*, *Leptogenys* and *Simopelta* are described and/or figured. The younger larvae of *Mystrium* and *Simopelta* are given special attention. The mature larva of *Simopelta* is described for the first time. References to ponerine larvae in the literature are cited.

SUBFAMILY PONERINAE

W.M. Wheeler (1922:56): "Larvae with the mandibles powerfully developed for ant larvae; the anterior portion of the body long, slender and neck-like, folded over on the swollen abdominal portion; the segments are either densely hairy all over or are covered with rows of peculiar tubercles beset with more or less prominent bristles. The larvae of *Megaopone* and *Bothroponera* are hairless.

"In the Ponerinae the larvae are nearly always fed with pieces of solid food, which is almost invariably animal matter."

TRIBE 1. AMBLYOPONINI Genus AMBLYOPONE Erichson

Amblyopone australis Erichson. Wilson (1971:33) had a photograph of larvae of various sizes; no larva was completely shown.

Genus MYSTRIMUM Roger *Mystrium mysticum* Roger

We have recently received 30 larvae of this species from Madagascar, courtesy of Dr. G. Wegener. After studying these we conclude that the larva described as mature in our 1980 paper was submature. Consequently we have completely revised our treatment of this species.

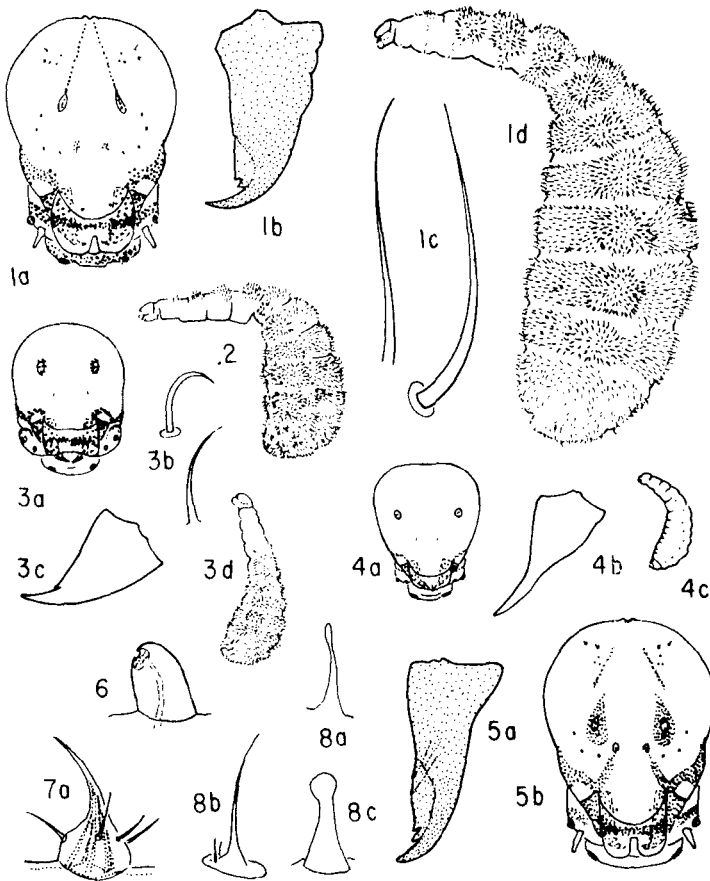
MATURE WORKER LARVA. Figure 1. Length (through spiracles) 6.2-6.9 mm; average 6.7 mm. Profile pogonomyrmecoid; neck long and slender; diameter greatest at AVI; lateral longitudinal welts well developed; head small, on anterior

end. Anus posteroventral. Leg and wing vestiges present. Somites distinct. Spiracles on thorax vestigial; abdominal spiracles minute, decreasing slightly posteriorly. Integument spinulose, the spinules most prominent on venter of thorax, on intersegmental areas and on all surfaces of AVIII-AX. A deep crease on the dorsum in the intersegmental area of AI-AII and a smaller one between AII-AIII. Body hairs abundant, 0.025-0.163 mm long, unbranched, smooth, slightly curved, a few with alveolus and articular membrane on each somite; few on venter of thorax, more numerous dorsally and posteriorly; intersegmental membranes distinctly without hairs on thorax and on AI-AVIII. Cranium subpyriform, 1.2 times longer than broad; with a pair of slender sclerotized bars running obliquely outward from mid-dorsum and ending at antennae; pleurostoma well developed. Antennae small with 3 sensilla, each bearing a minute spinule. Head hairs lacking. Labrum bilobed with a median furrow on anterior surface; chiloscleres well developed; each half of anterior surface with about 7 sensilla; ventral surface with 2 sensilla medially and about 12 sensilla in each lateral cluster; entire posterior surface spinulose, the spinules minute and in long rows dorsally, spinules longer and in shorter rows ventrally; middle of posterior surface with about 12 sensilla. Mandible ectatommoid; heavily sclerotized; apical tooth short and slender, curved medially and slightly posteriorly; 2 small subapical teeth. Maxilla with paraboloidal apex; densely spinulose, the spinules large and directed laterally, in short arcuate rows; palp a small knob with 5 (3 apical and 2 basal) sensilla; galea tall, digitiform, with 2 apical sensilla. Labium spinulose, the spinules longest medially, short and in longer rows laterally; a spinulose transverse welt dorsally; palp represented by a cluster of 5 (1 with a raised capsule and 1 digitiform) sensilla; an isolated sensillum between each palp and the opening of sericteries, the latter moderately wide and slightly projecting.

SUBMATURE WORKER LARVA: Figure 2. Length (through spiracles) about 6.2 mm. Described 1980:527.

YOUNG LARVA. Figure 3. Length (through spiracles) about 3.3 mm. Lateral longitudinal welts feebly developed. Body hairs 0.008-0.015 mm long on dorsum of T1-T3; 0.013-0.05 mm long on dorsal and lateral surfaces of AI-AIX. Antennae elliptical; surrounded by a small sclerotized band. Labrum feebly bilobed; anterior surface of each half with 4 sensilla near ventrolateral corner; ventral surface of each half with 2 medial and about 5 lateral sensilla; posterior surface spinulose, the spinules minute and in short arcuate rows. Mandible without medial blade; with 2 subapical medial denticles. Maxilla with minute spinules in short arcuate rows, the rows in long concentric rows around base of galea, spinules directed laterally; palp a small knob with 5 (1 with a digitiform cap) sensilla; galea a frustum with 2 apical sensilla. Labium with minute spinules; palp represented by a cluster of 5 sensilla. Otherwise similar to submature worker larva.

VERY YOUNG LARVA. Figure 4. Length (through spiracles) 1.4-1.8 mm. Greatest diameter at AVI, decreasing gradually to anterior end and more rapidly to posterior end. Head same diameter as T1. Body hairs lacking. Spinules few on AVI, isolated and in short transverse rows on AVII-AX. Labrum with about 20 sensilla on each half; posterior surface with about 8 sensilla medially, short rows of spinules ventrally. Mandible slender, base slightly dilated, apical tooth long and slender. Maxilla with apex narrowly rounded, spinulose; palp a slight elevation bearing 5 (1



FIGURES 1-5. *Mystrium mysticum*. FIGURE 1. Mature worker larva. a, Head in anterior view, X40; b, left mandible in anterior view, X214; c, 2 body hairs, X400; d, larva in side view, X10. FIGURE 2. Submature larva in side view, X10. FIGURE 3. Young larva. a, Head in anterior view, X70; b, 2 body hairs, X400; c, left mandible in anterior view, X214; d, larva in side view, X10. FIGURE 4. Very young larva. a, Head in anterior view, X70; b, left mandible in anterior view, X214; c, larva in side view, X10. FIGURE 5. Queen larva. a, Left mandible in anterior view, X214; b, head in anterior view, X214. FIGURE 6. *Leptogenys diminuta*. Spiracle on papilla with opening directed posteriorly, X83. FIGURES 7 AND 8. *Leptogenys bohlsi*. FIGURE 7. Immature tubercle enclosing mature tubercle, X200. FIGURE 8. Very young larva. a, Thoracic tubercle, X200; b, tubercle on AI-AVI, X200; c, tubercle on AVII-AX, X200.

digitiform) sensilla; galea represented by 2 contiguous sensilla. Labium with short rows of minute spinules. Otherwise similar to young larva.

YOUNGEST LARVA. Long ellipsoidal and straight (0.57 mm long, 0.3 mm wide). Shaped like an egg but with spinulose integument, mouth parts, etc. [Too fragile for further study.]

MATURE QUEEN LARVA. Figure 5. Length (through spiracles) 9.5-10.2 mm. Very similar to mature worker larva except in the following details. Pleurostoma more widely and heavily sclerotized. Antenna at midlength of head; surrounded by a sclerotized band. Labrum with chiloscleres well developed. Mandible with 2 or 3 subparallel oblique rugae terminating on medial surface and producing a slightly erose edge dorsal to medial denticles. Hypopharynx with arcuate ridges dorsally.

MATURE MALE LARVA. Length (through spiracles) 6.2-7.3 mm. Very similar to mature worker larva.

TRIBE 2. PLATYTHYREINI

Genus PLATYTHYREA Roger

Our study of the larva of *Eubothroponera* (1971) supported Brown's (1975:4) conclusion that this genus is a synonym of *Platythyrea*.

TRIBE 7. PONERINI

Genus BRACHYPONERA Mayr

Brachyponera chinensis (Emery)

Kôriba 1963: 4 instars, differentiated by head width. "It was comparatively easy to measure them because the larvae were always fixed on the bottom of the dish with their dorsal glutinous tubercles." The first 3 instars have 6 tubercles each, the fourth has only 2. Duration of stages given.

Genus CRYPTOPONE Emery

Cryptopone testacea (Motschulsky)

Length (through spiracles) about 3 mm. Similar to *C. rotundiceps* (1971:1208) except as follows. Tubercles more slender, up to 0.069 mm tall; doorknob tubercles about 0.113 mm tall. Tubercles 164, distributed as follows: 12 each on T1-T3 and AVII-AIX, 14 on AI and AII, AIII-AVI with 12 subconical and 2 doorknob tubercles each, AX with 8. Body hairs 0.025-0.075 mm, smooth or with a few denticles. Cranium feebly cordate, slightly wider than long. Head hairs 0.038-0.06 mm long, slightly curved, smooth or shaft with apical portion densely denticulate. Antennae small. Ventral surface of labrum with 5 sensilla on each half; posterior surface with spinules minute and in short to long transverse rows. Mandible more slender. Maxillary palp slender, digitiform, with 5 (3 apical and 2 lateral) sensilla; galea taller and more slender. Labial palp with 4 apical and 1 adjacent sensilla.

Material studied: numerous larvae from Pulau-Laut, S.E. Borneo, 3-VII-1922, courtesy of W.L. Brown.

Genus *LEPTOGENYS* Roger

CORRECTION: Wheeler and Wheeler 1976:62. In the legend for Figure 6 change *dimidiata* to *diminuta*.

Leptogenys bohlsi Emery

MATURE LARVA. Figure 7. Length (through spiracles) 4.7-6 mm. Very similar to *Leptogenys (Leptogenys)* sp. #691 (1952:640) except in the following details. Tubercles 140 arranged thus: T1, T2 and AX with 8 tubercles each, T3 and AIX with 10 each; AI-AVIII with 12 each. Posterior surface of labrum spinulose, basal spinules minute and in short arcuate rows and 2 clusters of 5 sensilla on middle of each half, ventrally sparsely spinulose medially, the spinules small and isolated or in short arcuate rows, with 2 sensilla ventrally on each half. Mandible with more numerous spinules on medial surface. Maxillary palp a skewed peg with 5 (4 apical and with a spinule each and 1 encapsulated) sensilla. Labial palp taller, with 5 (3 apical and bearing a spinule each, 2 subapical — 1 with a spinule and the other encapsulated) sensilla. Hypopharynx spinulose, the spinules minute and in short transverse rows.

IMMATURE LARVA. Figure 8. Length (through spiracles) about 3 mm. Similar to mature larva, except as follows. Tubercles frusta with a spire, with about 6 hairs about 0.03 mm long, unbranched, smooth; 134 tubercles distributed thus: 8 each on T1-T2, 10 on T3 and AIX, 12 on each AI-AVIII, 2 on AX. Maxillary palp with 5 (2 apical, 2 subapical and 1 lateral) sensilla. Ventral border of labium feebly bilobed; palp with 5 (2 apical, 2 subapical and 1 lateral) sensilla; opening of sericteries a narrow slit on anterior surface.

VERY YOUNG LARVA. Figure 9. Length (through spiracles) about 1.5 mm. Similar to immature larva, except as follows. Tubercles of 3 types: (1) 0.05-0.088 mm tall, on T1-T3, stout-based, slender shaft and slightly enlarged tip; (2) 0.05-0.1 mm tall, with stout base and long slender spire, usually with 4 hairs about 0.006 mm long, on AI-AVI; 0.05-0.09 mm tall, with stout base and bulbous tip, on AVII-AX. Integument with minute spinules. Ventral border of labrum with 2 frusta each with 2 sensilla. Mandible with a small lateral subapical point directed posteriorly. Labrum with numerous rather large spinules in short rows; palp with 5 (3 apical and 2 lateral) sensilla; galea conoidal, with 2 apical sensilla. Labial palp a skewed peg with 5 sensilla.

Material studied: 7 larvae from Brazil, courtesy of Dr. W.L. Brown.

Leptogenys castanea Mayr

Length (through spiracles) about 3 mm. Similar to *Leptogenys (Leptogenys)* sp. #691 (1952:640) except as follows. Tubercles 144; distributed thus: T1 and AX 8

each, T2 and T3 10 each; AI-AIX 12 each. Antennae closer together. Mandible with apical portion concave and divided into 2 teeth, with each apex directed posteriorly. Maxilla globose and appearing adnate; palp a skewed peg with 5 sensilla. Labial palp a skewed peg with 5 sensilla. Hypopharynx spinulose, the spinules minute and in short arcuate rows basally, longer and in transverse rows ventrally. (Material studied: 1 larva from South Africa, courtesy of Dr. W.L. Brown.)

***Leptogenys diminuta* (F. Smith)**

Figure 6. Spiracle.

***Leptogenys elongata* (Buckley)**

Petralia and Vinson: 1979. Venter — description and SEM.

Genus SIMOPELTA Mann

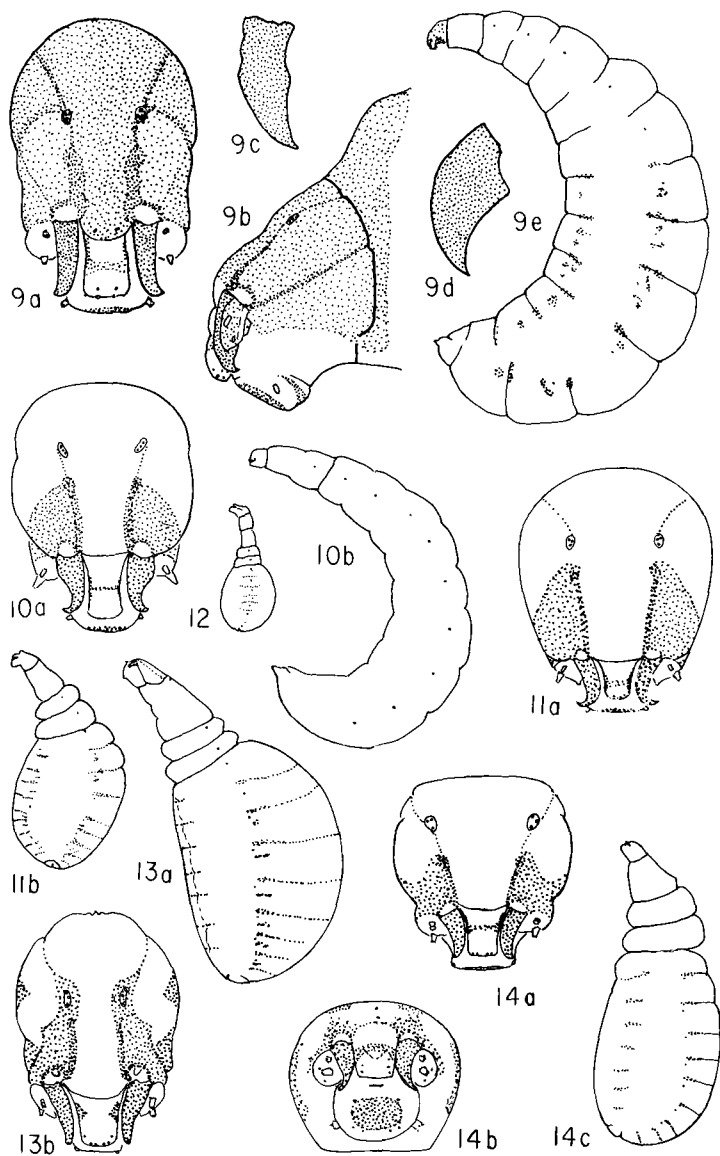
The first description of a larva of this genus was by Borgmeier in 1950. His drawing and description presented a creature quite unlike any ant larva we had seen; so we asked Dr. Borgmeier for a sample in order that we might prepare it by the same technique we had always used for ant larvae. He generously sent us 70. We finally convinced ourselves that they were ant larvae (1957).

In 1966 Gotwald and Brown described the larva of "small and medium sizes" of their new species *S. occulta*. They did not illustrate the small larva, but their description indicated basic similarity to the immature larvae of *S. pergandei*. Their drawing of a "medium-sized (second instar?)" is consistent with our description of the mature larva (see below).

***Simopelta* sp.**

MATURE LARVA. Figure 9. Length (through spiracles) about 5.1 mm. Myrmecoid, strongly curved ventrally, widest at AVI, decreasing gradually toward

FIGURES 9-14. *Simopelta*. FIGURES 9-12. *Simopelta* sp. (1430a, Costa Rica). Mature larva. a, Head in anterior view, X167; b, head in side view, X167; c, left mandible in anterior view, X278; d, left mandible in side view, X278; e, larva in side view, X73. FIGURE 10. Submature larva. a, Head in anterior view, X167; b, larva in side view, X73. FIGURE 11. Young larva. a, Head in anterior view, X167; b, larva in side view, X73. FIGURE 12. Very young larva in side view, X73. FIGURE 13. *Simopelta* sp. (#1030, Costa Rica). Young larva. a, Larva in side view, X73; b, head in anterior view, X152. FIGURE 14. *Simopelta* sp. (Colombia). a, Head in anterior view, X139; b, head in ventral view (=looking into mouth), X139; c, larva in side view, X18.



anterior end and more rapidly toward posterior end which is sharp-pointed. Anus ventral. Head small. Leg and gonopod vestiges present. Somites distinct. Spiracles minute, decreasing slightly posteriorly. Integumentary structures in intersegmental areas on abdomen dorsolaterally, anterior and posterior to spiracles and a pair ventrolaterally on AIII-AVII. Integument spinulose, the spinules minute and in rows, the rows long on T1-T3, shorter elsewhere. Body hairs lacking. Cranium longitudinally subelliptical, 1.6 times as long as broad; cranium (except gula) sclerotized. Antennae minute, a sclerotized band extends from the medial edge of each mandible through anterior tentorial pit and antenna to occiput. Head hairs lacking. Labrum subrectangular, width 0.8 times length; chiloscleres present; anterior surface with 4-6 sensilla; ventral surface with 4-6 sensilla; posterior surface spinulose, the spinules long and in transverse rows. Mandible dinoponeroid; apex turned laterally and posteriorly; heavily sclerotized. Maxilla small; apex short and paraboloidal; palp a short frustum with 5 (2 with a minute spinule, 1 digitiform, 1 with a large capsule and 1 subapical with a spinule) sensilla; galea a short cone with 2 apical sensilla. Labium wide, anterior surface with rows of spinules; palp at ventrolateral corner, a small cylinder, sensilla similar to maxillary palp; an isolated sensillum between each palp and the opening of the sericteries; the latter a transverse slit; venter of labium with a sclerotized circular area, which has a diameter about 0.6 times width of labium. Hypopharynx spinulose, the spinules minute and in short transverse rows.

SUBMATURE LARVA. Figure 10. Length (through spiracles) about 3.8 mm. Similar to mature larva except as follows. Body more slender. Head and mandibles less sclerotized.

YOUNG LARVA. Figure 11. Length (through spiracles) about 2.2 mm. Thorax slightly curved ventrally, long and slender, about same diameter as head; T2 short, diameter twice that of T1; T3 short, its diameter somewhat greater than T2; abdomen subovoidal and swollen, its diameter about 5 times that of T1. Head small. Anus terminal. Spiracles minute, decreasing in diameter posteriorly. Somites of abdomen indistinct. Integument with dorsolateral and ventrolateral intersegmental structures on abdomen. Spinules minute and in rows on venter of T1-T3. Body without hairs. Cranium subovoidal; sclerotized ventrolaterally from the tentorial pit down to mandible. Antenna minute, with 3 sensilla. Head without hairs. Labrum subrectangular; width 0.7 times length; chiloscleres present; anterior surface with 2 sensilla; ventral surface with 6 sensilla and a few spinules; posterior surface with transverse rows of minute spinules. Mandible dinoponeroid; apex turned laterally and posteriorly; heavily sclerotized. Maxilla small, apex produced into a rounded point, with a few rather coarse spinules; palp a crooked peg with 5 (1 with a large capsule, 3 with a spinule each and 1 lateral with a long spinule) sensilla; galea a short cone with 2 apical sensilla. Labium sparsely spinulose, the spinules long and in subtransverse arcuate rows; palp similar to maxillary palp; at ventrolateral corners; an isolated sensillum between each palp and the opening of the sericteries, the latter a short transverse slit; venter of labium with a sclerotized area about 1/2 width of labium. Hypopharynx densely spinulose, the spinules in short subtransverse rows, the rows so close together and the spinules so long that the spinules overlap.

VERY YOUNG LARVA. Figure 12. Length (through spiracles) about 1.3 mm. Nearly straight. Thorax and AI forming a neck; T1 and T2 slender and cylindrical;

T3 and AI shorter and of greater diameter; remainder of abdomen subellipsoidal, its greatest diameter 4 times that of T1. Body hairs and intersegmental structures lacking. Cranium subhexagonal in anterior view; sclerotization weaker. Otherwise similar to young larva.

Material studied: numerous larvae #1430a, Aljuela, Costa Rica, Penos Blancas; 940 m; 10.302 N, 84.706 W; 4 July 1984; courtesy of Dr. J.T. Longino.

Simopelta sp.

YOUNG LARVA. Figure 13. Length (through spiracles) about 2 mm. Similar to *S. sp.* 2.2 mm larva above, except as follows. Neck more gradually tapered; diameter of abdomen greatest at AVIII and about 4 times diameter of T1. Anus posteroventral. Abdomen flattened ventrally, swollen dorsally. A larger portion of cranium sclerotized. Labrum width 1/2 length. (Material studied: numerous larvae, #1030, San Jose, Costa Rica, courtesy of Dr. J.T. Longino.)

Simopelta n. sp. A

YOUNG LARVA. Figure 14. Length (through spiracles) about 2.8 mm. Neck less distinct (partially contracted?). Integument with minute spinules on venter of thorax and minute papillae elsewhere. Cranium with smaller area of integument sclerotized. Labrum with rows of spinules laterally. (Material studied: numerous larvae from Valle, Colombia, courtesy of Dr. W.L. Brown.)

TRIBE 8. ODONTOMACHINI

Brown (1976:76) in his monograph used our characterization as his characterization of the larva of what he called the subtribe *Odontomachiti* (= *Anochetus* and *Odontomachus*). On p. 77 he cited references to our summaries of available information on the morphology and bionomics. In his monographs (1976 and 1978) he updated our nomenclature of these 2 genera. He thought larval characters did not justify tribal status. [We have disagreed strongly (1985:260)].

Genus ANOCHETUS Mayr

***Anochetus gladiator* Mayr**

REVISION: 1976:62. Our material was labelled *Odontomachus gladiator* Don-sithrope. When Brown's monograph (1978) appeared we learned that the correct name should be as above.

***Anochetus princeps* Emery**

Brown (1976:77). This is the species we called *Anochetus sp.* in 1952:643.

Genus ODONTOMACHUS Latreille

REVISION: See above under *Anochetus*.

Odontomachus clarus Roger

Petralia and Vinson 1979: Venter — description and SEM.

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