

THE LARVA OF SIMOPELTA (HYMENOPTERA: FORMICIDAE)

GEORGE C. WHEELER AND JEANETTE WHEELER

Department of Biology, University of North Dakota

The larva of *Simopelta* deserves to be ranked with those of *Leptanilla* and *Proceratium* as the most aberrant and bizarre among the ants. In fact, when we first looked at Borgmeier's (1950) sketch, we doubted that it could be a formicid larva. It had a somewhat dipterous habitus and there are myrmecophilous larvae among the Diptera. So we asked Dr. Borgmeier if he would send us some material for study. His response was most generous—70 larvae.

A detailed study of this material revealed the presence of most formicid larval characters, but since we still had doubts, we sent some to Dr. Willis W. Wirth at the United States National Museum. Dr. Wirth¹ has written us that "the complete series of abdominal spiracles indicate that they are not dipterous. I know of no Diptera higher than the Fungivoridae-Itonididae series which have a complete series of abdominal spiracles. Traces of the usual pair of apical spiracles and the lack of a posterior differentiated pair of spiracles are practically always to be found in the higher Diptera."¹

Genus SIMOPELTA Mann

Body rather stout and nearly straight. Diameter greatest at abdominal somite IV, decreasing to the anterior end of the abdomen, then increasing to the mesothorax. Prothorax conoidal and capable of being retracted to a limited extent into the mesothorax; basal diameter (in preserved material) abruptly offset from

¹Obiter dictum: Dr. Wirth showed the larvae to a colleague, who said that if they were ant larvae, he was ready to believe anything.

the anterior end of the mesothorax. Terminal abdominal segment forming a small knob directed postero-ventrally. Tubercles sparse (72); fungiform, door-knob-shaped or irregular. Body and head hairs lacking. Antennae very small and situated high on the head, each with two sensilla. Mandibles falcate; base not dilated; without spinules or medial teeth; apex directed posteriorly, simulating the mouthhooks of maggots. Labial palps lateral.

Simopelta belongs to the section Euponerinae of the subfamily Ponerinae; the larvae of this section are characterized by having body tubercles. The tubercles of *Simopelta* appear somewhat similar to the glutinous dorsal tubercles of *Ponera* and *Euponera*, but otherwise there is little resemblance to other members of the tribe Ponerini. Head shape, high antennae, and the lack of hairs on the head suggest *Leptogenys* in the tribe Leptogenyini. On the other hand, *Simopelta* is unique among known ant larvae in (1) the general shape of the body and the shape of the thorax in particular; (2) the partial retractability of the prothorax; (3) complete absence of hairs; and (4) the shape and position of the mandibles. The lateral position of the labial palps is unusual but not unique.

***Simopelta pergandei* (Forel)**

Young larva—Straight length 1.6 mm; length through spiracles 1.7 mm. Body rather stout and nearly straight. Diameter greatest at abdominal somite IV, decreasing gradually to the posterior end, which would be broadly rounded were it not for the terminal somite that forms a small knob directed posteroventrally; decreasing anteriorly to the anterior end of the abdomen, then increasing to the mesothorax. Prothorax conoidal and capable of being retracted to a limited extent into the mesothorax; basal diameter (in preserved material) abruptly reduced from the diameter of the anterior end of the mesothorax, giving an offset appearance. Head on the anterior end. Anus posteroventral. Leg and gonopod vestiges present. Segmentation indistinct. Body beset with 72 tubercles which are fungiform, doorknob-shaped, or irregular (in preserved material). Tubercles arranged in 8 longitudinal rows; the mesothoracic through the seventh abdominal somite each bearing 8 tubercles. Segmentation indistinct. Integument thickly beset with minute papillae (about 0.0012 mm in diameter). No body hairs. Cranium longer than broad; widest at the bases of the mandibles; dorsal outline rounded. Head with 10 small sensilla but no hairs. Antennae very small and high on the cranium; each with 2 sensilla, each of which bears a minute spinule. Labrum narrow, slightly longer than broad, thick; the blunt ventral surface with 8 sensilla; each lateral surface with 1 sensillum; posterior surface spinulose, the spinules rather long (about 0.009 mm) and arranged in subtransverse rows, the rows so close together that their spinules overlap. Mandibles heavily sclerotized; falcate; base not dilated; without medial teeth; surfaces smooth; apex directed posteriorly. Maxillae not distinctly marked off from the head; the apex bearing a few long slender spinules; palp a low knob with 1 lateral (bearing a spinule) and 3 terminal (2 small with a spinule each and 1 large and encapsulated) sensilla; galea a tall frustum bearing 2 apical sensilla. Anterior surface of labium spinulose, the spinules long and in subtransverse rows, the rows so close together

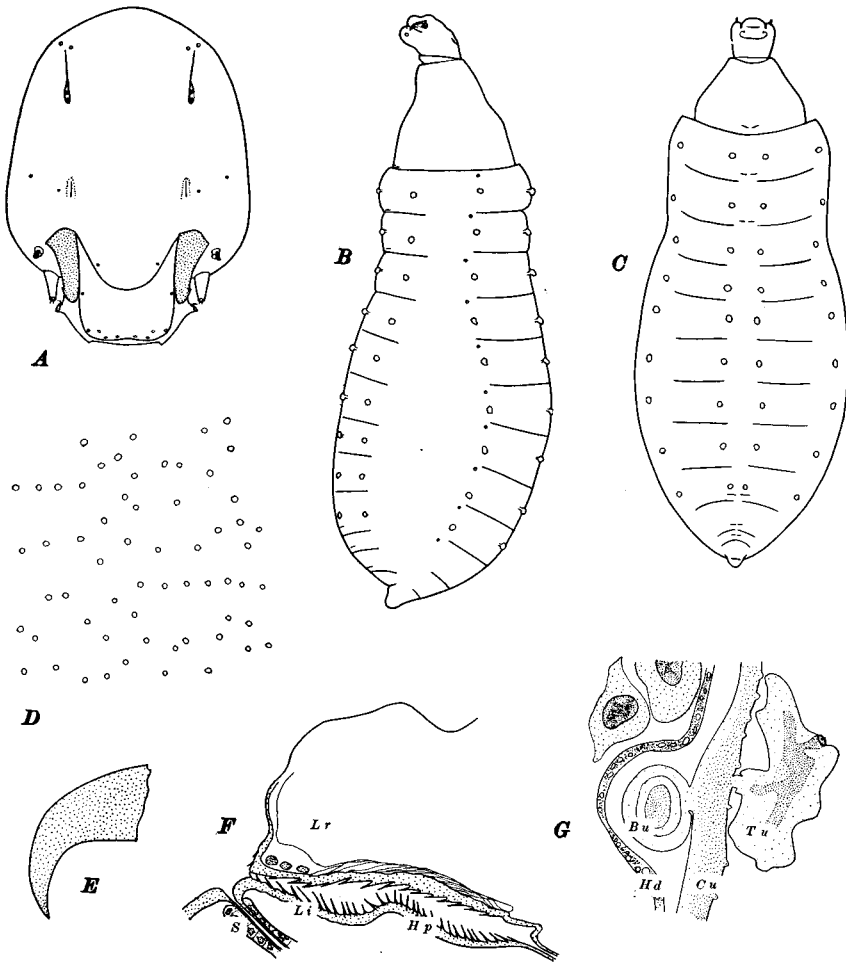


FIG. 1.—*Simopelta pergandei* (Forel), *A*, head in anterior view, X205; *B*, larva in side view, X44; *C*, larva in ventral view, X44; *D*, surface view of cuticular spines, X635; *E*, left mandible in lateral view, X282; *F*, mouth parts in sagittal section, X625; *G*, tubercle and adjacent bulb in section, X635. *Bu*, bulb; *Cu*, cuticle; *Hd*, hypodermis; *Hp*, hypopharynx; *Li*, labium; *Lr*, labrum; *S*, duct of sericteries; *Tu*, tubercle.

that their spinules overlap; palps lateral, each a low knob with 1 lateral (bearing a spinule) and 3 terminal (2 small with a spinule each and 1 large and encapsulated) sensilla; opening of sericteries a long transverse slit on the ventral surface of the labium. Hypopharynx densely spinulose, the spinules long and in numerous transverse rows, the rows so close together that their spinules overlap. (Material studied: numerous larvae from San José, Costa Rica, collected by H. Schmidt.)

Borgmeier 1950 (p. 376) states (translation from Portuguese): "I was able to examine more than 70 larvae of this species. None of them appears to have attained complete development, but at most scarcely 2 mm. in total length (the worker is 3 mm.). Some specimens were treated with lactic acid, and the form and structure were perfectly visible under high magnification. The color is cream. The thoracic segments are sharply marked off from the abdominal segments. There is a slight constriction in the height of abdominal segments 2-3 and they are enlarged in the posterior half of the abdomen. In specimens preserved in alcohol the form is more flattened and more enlarged posteriorly, and thoracic segments 2-3 are usually retracted. Abdominal segments 1-9 bear on the dorsal and ventral surface transverse rows of 4 circular papillae. The integument is naked, without hairs." (Fig. 12 on p. 375, larva in dorsal view.)

REFERENCE

- Borgmeier, T. 1950. A fêmea dichthadiiforme e os estádios evolutivos de *Simopelta pergandei* (Forel), e a descrição de *S. bicolor*, n. sp. Rev. de Ent. 21: 369-380, illus.