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STUDIES ON CENTRAL AFRICAN ANTS OF THE GENUS *PSEUDOLASIUS* EMERY (HYMENOPTERA, FORMICIDAE)¹

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While the senior author was biologist to the Central African Expedition of the American Museum of Natural History, several colonies of the rare genus *Pseudolasius* were collected. In the African literature are but six references to members of this genus. The ants are seldom observed, since they are hypogeic, probably tending coccids on the roots of plants as do their Neotropical congeners, *Acropyga* subgenus *Rhizomyrma*, which they closely resemble.

The present article, in addition to adding new biological data, demonstrates for the first time statistically in this genus a true dimorphic condition in the worker caste.

The ants are small, pale yellow, and blind or with eyes reduced to a vestige in the form of a slit or a minute spot. As in *Acropyga* (Weber, 1944), the surface of the body is smooth and devoid of spines which might impede their passage through the soil. They have been taken from the stomachs of toads (*Bufo superciliaris* and *polycercus*) and attending coccids (*Pseudococcus citri*) about the roots of coffee.

CLASSIFICATION

Pseudolasius was established by Emery in 1887 for *Formica familiaris* F. Smith, of Celebes, after reëxamination of Smith's type specimen, and this genus has been accepted by all subsequent

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students. *Formica* was in Smith's day a receptacle for a great assemblage of heterogeneous ants, and the two genera now are considered unrelated.

The worker was characterized by Wheeler (1922) as "small, polymorphic, the head of the major being large and differently shaped from that of the minor," and Emery (1925, p. 213) referred to "dimorphism plus ou moins apparent." While resembling *Acropyga* in reduction of eyes, color, and general habitus, *Pseudolasius* as a rule is larger and has a more cordate head. Both genera are tropical except that the Neotropical region lacks *Pseudolasius* and contains one *Acropyga* subgenus, *Rhizomyrma*. The worker is more like the worker of the Holarctic *Lasius* and especially its subgenus *Acanthomyops*, but the former has eyes, if any, in front of the middle of the head and has very short palpi, both maxillary and labial having three segments. Other morphological characters make separation of *Pseudolasius* and *Lasius* easy, and there is in addition no overlapping geographically. *Lasius* is entirely Holarctic; *Pseudolasius* is known from Indo-Malaya, Papua, Australia, and Ethiopia. In Africa they are known only from within 5° or 10° on either side of the Equator. Arnold's great South African monograph does not mention them.

The African species are:

Pseudolasius bucculentus Wheeler

Type locality: Medje, Belgian Congo

Pseudolasius bufonum Wheeler

Type locality: Medje, Belgian Congo

Pseudolasius gowdeyi Wheeler

Type locality: Entebbe, Uganda

Pseudolasius myersi Weber

Type locality: Imatong Mountains, Anglo-Egyptian Sudan

Pseudolasius weissi Santschi

Type locality: Brazzaville, French Congo

Pseudolasius weissi sordidus Santschi

Type locality: Aburi, Gold Coast

Other locality: Akenge, Belgian Congo

Pseudolasius myersi occipitalis, new subspecies

MAXIMA WORKER: Length, 3.9–4.4 mm.; length of the thorax, 1.2–1.3 mm. Head in front view, excluding mandibles, barely longer than wide, occipital margin broadly and distinctly impressed, sides strongly convex, anterior clypeal margin convex;

mandibles six toothed; eyes minute spots or slitlike; antennal scapes clearly shorter than the occipital angles. Thorax in side view convex with distinct meso-epinotal impression; from above the pronotum appears about one-third wider than the epinotum; petiole bidentate above, with broad medial impression.

Sub-lucid, integument minutely and shallowly reticulate; pilosity of scattered upright yellowish hairs and an abundant, appressed pubescence.

Pale brownish yellow.

MINIMA WORKER: Length, 2.5–2.8 mm.; length of the thorax, 0.9–1.0 mm. Head proportionately smaller, with occipital margin less impressed than in maxima caste; eyeless, sculpturing as in maxima, pubescence less abundant, color similar.

BROOD: Eggs elliptical, white, 0.18–0.20 mm. wide by 0.39–0.41 mm. long. Larva slender, hairs generally compound, mostly multifid, the longest in a 1.5-mm. larva about 0.03 mm. The larvae are white or slightly brownish with an easily observable dark intestinal mass about the level of the fifth to ninth segments. They are covered with bristly hairs which are best seen in the middle of the segments rather than in the trough of the segmental constrictions. These hairs, on examination under oil immersion, at a magnification of about 900 times, are seen to consist of a basilar scale or articulation socket and a branched stalk. The stalk divisions seem to be primarily of two types, one in which the stalk is thin and branches at the top only, the other in which the stalk is thicker and branches irregularly from shortly above the basal scale to the apex, the latter being divided into several branches. Pupae in a related Congo form are naked.

TYPE LOCALITY: Busnia, just within Uganda on the Kenya-Uganda border, February 17, 1948.

From cotypes of *myersi* the present form differs largely in having the occipital margin more deeply impressed and a distinctly duller and less bright yellow color. The pubescence of *myersi* appears less conspicuous or less abundant. The other known African species are recorded with five teeth.

DIMORPHISM

When the type colony was collected, the differences in size of the workers were striking, and dimorphism was clearly suggested. The descriptions, figures, and graphs establish the fact.

The general shape of the head of the maxima worker is cordate;

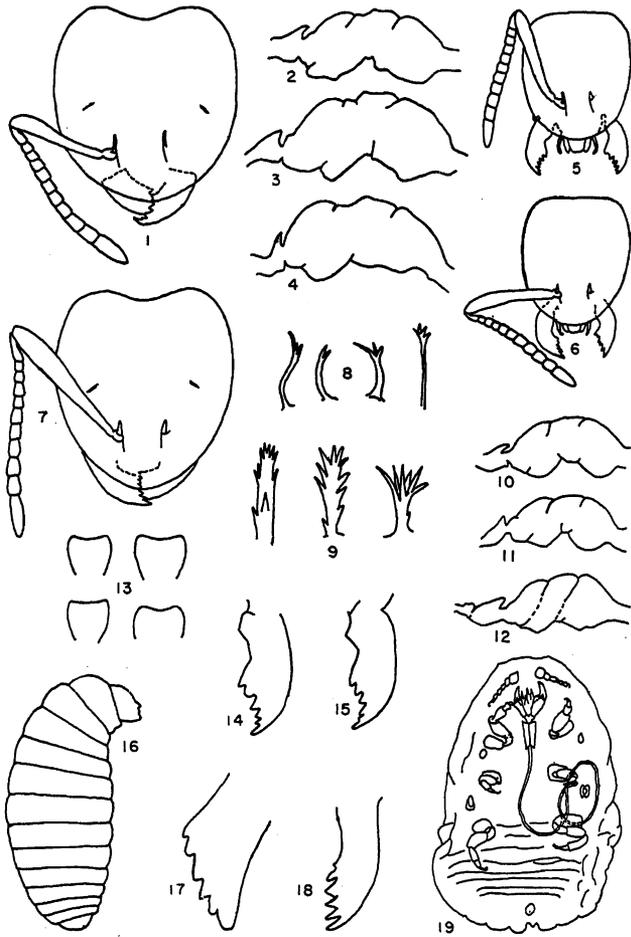


FIG. 1. Outline of worker maxima head.

FIGS. 2-4. Outlines of worker maxima thorax and petiole.

FIGS. 5, 6. Outlines of worker minima heads.

FIG. 7. Outline of worker maxima head.

FIGS. 8, 9. Outlines of larval hairs.

FIGS. 10-12. Outlines of worker minima thorax and petiole.

FIG. 13. Outlines of worker petiolar scales, minima on the left, maxima on the right.

FIGS. 14, 15. Outlines of worker mandibles.

FIG. 16. Outline of larva.

FIGS. 17, 18. Outlines of worker mandibles, inner view (left) and outer view (right).

FIG. 19. Ventral view of coccid taken with the ants and possibly associated with them.

All specimens figured are from the type colony of *Pseudolasius myersi occipitalis*.

with the occiput sharply impressed medially and with broad occipital corners. The length-width head ratio, excluding the mandibles, is 1.07:1.0. The antennal scapes distinctly do not reach the occipital corners. Eye vestiges appear only in the maxima worker caste. In 11 of 12 specimens observed, the eyes were definite and outstanding as puckered dark slits on the lateral part of the head about one-half of the total distance from the occipital margin. In the twelfth specimen the right eye was very faintly distinguishable as a wrinkling or puckering, and the left eye was entirely absent. The mandibular teeth appear to be constant in number. Twelve maxima workers were observed, all of which had six teeth. No workers were observed to have four, five, or seven teeth, each of the six teeth was well defined, and none appeared rudimentary. The apical tooth is usually longer and more conic than the other five, which are triangular or saw-tooth shaped. The integument is shiny and appears quite smooth under low powers with the exception of the hairs. The workers are light brownish yellow in color.

The head of the minima worker has rather flattish occipital corners and a slight median impression. The head length-width ratio is 1.15:1.0. The antennal scapes distinctly exceed the occipital margins. No trace of any sort of eye vestiges was observed in the minima worker. Twenty-six workers were examined for eye traces, and none was found. This is taken to be characteristic, although there may be rare cases of eye vestiges in the minima worker that were unobserved. The mandibles of 57 minima workers were observed and all found to have six teeth similar in structure to those of the maxima worker.

The total length of each ant was measured from mandibles to abdomen tip, with some attempted correction made for those curled or bent to obtain more accurate data for the total length. The thorax length was also measured from the anterior pronotal margin to the posterior episternal angle. The thorax length is a more reliable criterion of dimorphism than total length because no measurement estimations are necessary. It also is more characteristic, because some of the ants had unusually short gasters with normal-sized head and thorax, a condition which is still unaccounted for.

The thorax measurements (fig. 20) are seen to fall distinctly into only two classes. The small worker shows some variation in thorax length, which is typical of a normal distribution curve,

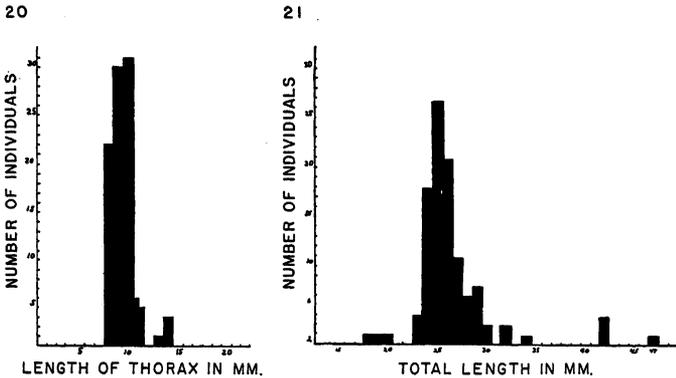


FIG. 20. Graph of thorax lengths, in millimeters, showing dimorphism of the worker caste in *Pseudolasius myersi occipitalis*.

FIG. 21. Graph of total lengths, in millimeters.

a large per cent of the whole falling in the middle, and a small fraction in the extreme, values. The large workers were unfortunately few but have quite constant thorax length despite a large variation in total length.

The second graph is for total length (fig. 21). Three minima ants with the short gasters have the total length much below the acceptable extremes, while their thorax length was normal. The total length of the minima worker as graphed shows a typical distribution curve, as does the thorax length, although there is more tendency to be spread out in the higher values than in the low ones. The maxima worker total length varies to such an extent that unless more specimens were observed the establishment of dimorphism against polymorphism on this basis alone would be open to considerable criticism. However, these measurements coupled with the thorax measurements, which are consistent, permit dimorphism to be established as a definite characteristic.

BIOLOGY

The Kenya-Uganda border at the colony site (less than latitude 1° N. of the Equator) is a grass woodland under intensive cultivation by a large native population. In a banana plantation at the side of the road an island consisting of a tree surrounded with a few bushes was left uncultivated. The colony lived in the damp tangled mass of leaves and soil about the roots of the bushes. The tangle, together with the lack of time, prevented

careful dissection, and as the soil was overturned the workers quickly scurried about, many carrying their brood. They avoided the light and took refuge under debris or quickly tunneled into the loose soil.

The maxima caste, strikingly larger than the minima, was far in the minority, and it was estimated that not more than one in 50 workers was a maxima. Some of the brood were kept in cells in decayed, buried fragments of wood. In at least one instance, larvae of similar size were in the same cell. A coccid taken with the ants may well have been associated with them. Anastomosing with the *Pseudolasius* chambers were chambers of a new species of *Oligomyrmex* (*thoracicus* Weber).

The vegetative island, while the site of the nest, was probably only part of the area used by the colony. Tunnels probably extended into the surrounding banana plantation, and it is possible that the ants tended coccids on the banana roots.

Appearance and behavior of the ants were exactly similar to those of the related genus *Acropyga* of the subgenus *Rhizomyrma* which the senior author studied in the Neotropical region (Weber, 1944), except for the presence of a maxima caste. The latter ants were found nesting in a similar manner and tending coccids under cacao, coffee, and banana plants.

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