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A STUDY OF THE GENUS *GESOMYRMEX* MAYR, AND A DESCRIPTION OF A SPECIES NEW TO THE GENUS

(Hymenoptera: Formicidae)¹

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The genus *Gesomyrmex* is of particular interest to the myrmecologist because only four living species and one variety have been known and these very rare insects probably represent "vanishing relicts of a group of Formicidae with huge eyes and 8-jointed antennae which was represented by numerous species during the Oligocene and Miocene Tertiary." (Wheeler, 1921, p. 114)

The genus *Gesomyrmex* was established by Mayr (1868, p. 50) for a single species, *hoernesii*, obtained from Baltic amber. Emery (1891, p. 581) described as new *G. corniger* from worker specimens in Sicilian amber. However Wheeler (1914, p. 111) showed that Emery's specimens, which are armed with long spines on head and thorax, are generically distinct from *Gesomyrmex*, and he erected for them the genus *Sicelomyrmex*. André (1892, p. 47) described a living species of *Gesomyrmex*, which he named *chaperi*, collected from the Kapoewas Basin, North Borneo. André (1892, p. 49) described a larger form with a more rectangular head and smaller eyes from the Kapoewas Basin and erected for it a new genus, *Dimorphomyrmex*, naming the genotype *D. janeti*. Emery (1905, p. 188) described from Baltic amber a form closely related to *D. janeti*, which he named *D. theryi*. Wheeler (1914, p. 107) described *G. annectens* and *D. mayri* from Baltic amber. The same author (1916, p. 16) described a single alate female from Luzon, P. I. and named it *D. luzonensis*.

From two workers collected near Canton, China, Wheeler (1929, p. 112) described *G. howardi*. Wheeler (1929, p. 2) described *G. kalshoveni* from 15 workers (4 maximae, 8 mediae, and 3 minimae) which had been collected in a teak forest at Semerang, Java. In this paper Wheeler states (p. 2) that "the new species from Java now shows that the specimens of *howardi* are really media and minima workers, that those of *G. hoernesii* and *chaperi*, described by Mayr and André are minimae, that those of *D. janeti* are maximae and mediae of *G. chaperi*, and that the workers of *D. theryi*, *D. mayri* and *G. annectens* are in all probability the maximae, large mediae and small mediae respectively of *G. hoernesii*." Wheeler (1930, p. 35) described *G. luzonensis* var. *chapmani* from a series of 43 workers², a single female, and a single male from Dumaguete, Negros Oriental, P. I. In this paper Wheeler had to compare the workers of the new variety with those of *G. kalshoveni*, inasmuch as the typical *luzonensis* is known only from the female.

I have been unable to find in the literature subsequent to 1930

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²The number in each caste is not specified.

further references to either collections or descriptions of forms of *Gesomyrmex*. In my collections of Indian ants I have found a series of *Gesomyrmex* workers which are apparently representative of a new species. A description and figure follow.

***Gesomyrmex spatulatus* n. sp.**

Holotype, major worker (Pinned specimen, Cole collection No. A-136).—Overall length of body, 5.09 mm.; length of head, excluding mandibles, 1.27 mm.; length of thorax, 1.97 mm.; length of gaster, 1.85 mm.

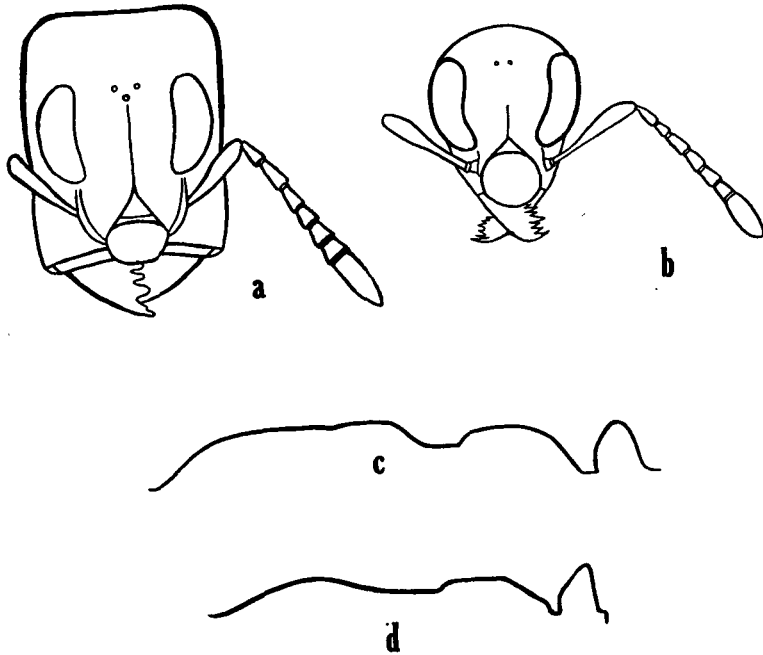


FIG. 1. *Gesomyrmex spatulatus* n. sp. a, head of major worker; b, head of minor worker; c, thoracic profile of major worker; d, thoracic profile of minor worker.

Head, excluding the mandibles, distinctly longer than broad, rectangular, only very slightly broader behind than in front; the sides subparallel, slightly concave in front of the middle; posterior corners sharply rounded; posterior border nearly straight; occipital margin broadly and arcuately excized; gular surface rather flat. Eyes large, elliptical, approximately twice as long as broad, slightly narrower anteriorly than posteriorly, located dorsad to the middle of the genae, the distance from the upper eye margin to the upper border of the head more than twice that from the lower eye margin to the antennal insertion. Lateral ocelli minute but distinct, unpigmented; median ocellus even smaller, indistinct. Mandibles rather flat, broad, the inner

border concave, the outer border convex; apical tooth short, broad, blunt; other teeth short, broad, rather blunt, and crowded. Clypeus subhexagonal, broader than long, flattened, ecarinate, rather triangularly depressed just below the middle; anterior margin broad, subtruncate, slightly but not distinctly covering the inner margins of the mandibles when they are in repose. Frontal area large, triangular, distinct, its angles nearly equal. Frontal groove distinct, rather deep in its central portion, extending from upper corner of frontal area to just below the lateral ocelli. Frontal carinae distinct, extending from the lateral clypeal margins to the lower borders of the compound eyes, broader in the middle, deflected laterally and obscuring the antennal insertions. Antennae short, eight-jointed; scape rather sharply incrassated from the middle apically, its distal end extending to a little more than half the length of the compound eyes, its apex a little more than twice the width of its base; funiculi with the first three segments longer and more slender than the remaining segments (except the terminal segment) which become increasingly broader apically; terminal segment longest of all and slightly broader than the penultimate segment, rather pointed, forming the end of a rather indistinct club.

Thorax long and slender, broadest through the pronotum, much narrowed at the mesonotum; pronotum seen from above elliptical, the length and breadth subequal; pronotum seen from the side evenly and broadly convex, except for the anterior declivity which is rather steep and slightly concave near its base; promesonotal impression shallow: constriction between mesonotum and epinotum broad, flattened, bearing on each side a tubercle supporting a spiracle; upper surface of epinotum extending above the mesoepinotal impression, slightly convex, a little longer than the rather steeply sloping, flat, posterior declivity, bearing on each side a large, posteriorly directed spiracle; mesonotum as broad as long, about half as broad as the pronotum; epinotum longer than broad, a little narrower than the pronotum. Petiolar node a little higher than the epinotum, its anterior surface convex, its posterior surface more flattened and declining posteriorly from apex to base where it joins the keel-like margin of the petiole; its superior border broadly but very distinctly emarginate, the excision continuing as a shallow groove along the middle of the anterior surface of the node; seen from behind broader above than below, with rather sharply rounded superior corners. Ventral surface of petiole when seen from the side with a longitudinally elongated, broadly convex lobe. Legs with all femora distinctly incrassated at the base; tarsal claws slender, distinctly curved, sharp at their tips.

Gaster rather large, elliptical.

Entire body shining. Head and petiole very sparsely and finely punctate; mandibles with more pronounced punctures; pronotum densely and finely foveate-punctate; mesonotum, mesoepinotal impression, and epinotum densely and rather coarsely foveate-punctate. Mandibles, clypeus, front of head, fore coxae, and posterior declivity of mesonotum (near the mesoepinotal impression) with rather coarse, irregular, longitudinal striae. What appear to be striae on the epinotum and the coxae of mid and hind legs are merely internal structures visible through the semitransparent integument.

Hairs yellow; long and pointed on the antennae (sparse and oblique on scapes, rather numerous on funiculi) long, numerous, and clavate with spatulate tips on upper surface of mandibles and on clypeus; long, slender, sharp, and rather numerous on lower surface of mandibles; long, sparse, and clavate-spatulate between upper margin of clypeus and lower margin of eyes; long, slender, pointed, and rather numerous on gula; becoming clavate-spatulate anteriorly; short, pointed, and abundant on palpi; long, slender, sharp, and rather sparse on ventral surface of pronotum, on coxae, petiole, and gaster, and on dorsal, apical margins of fourth and fifth gastric segments; a row of a few long, slender, pointed hairs on ventrolateral margins of petiole, and a row on each posterior-lateral margin of epinotum; slender, pointed, and very sparse on trochanters and femora; absent from upper surface, sides, posterior margin, and posterior corners of head, from dorsal surface of thorax and petiole, and from most of the gaster. Pubescence very short, sparse, and indistinct.

General color of body yellowish brown; legs paler; clypeus (except its anterior margin), antennal scapes, and the striated region around the frontal area more whitish; a semicircle of brown extending across the posterior head margin and into the upper eye margins; mandibular teeth very dark brown; median portion of clypeus with a faint longitudinal band of light brown; mandibles, anterior clypeal border, and antennal carinae light brown; eyes distinctly violaceous. Dorsum of pronotum light brown with a V-shaped lighter area medially, the apex of the V pointing forward; dorsum of epinotum light brown; dorsum of gastric segments light brown, basal portion of first segment and lateral margin of each succeeding segment whitish; tarsal claws reddish brown.

Paratypes, minor workers.—Combined lengths of head and thorax of each of the 7 specimens are as follows: 1.94, 2.12, 2.30, 2.31, 2.33, 2.33, and 2.33 mm. The minors differ from the majors in the following characteristics: Size smaller; head not rectangular, much narrower anteriorly than posteriorly, its posterior border convex, its posterior corners not angular; eyes much larger in proportion to head size and more bulging; clypeus longer and projecting much farther forward over the mandibles, its anterior border arcuate instead of subtruncate, with a median longitudinal convexity; frontal area, frontal groove, and lateral ocelli much less pronounced; frontal carinae short and indistinct; median ocellus absent; mandibles narrower, greatly arched (that is, their lower surfaces greatly concave) their teeth longer and sharper, the apical tooth especially so; antennal scapes proportionally longer and more slender; mesonotum less convex in profile; dorsal surface of epinotum more flattened in profile, its posterior declivity straighter; a low, longitudinal, keel-like elevation along each dorsolateral margin of the mesoepinotal impression; petiolar node slightly less deeply excized along its superior border; pilosity very scarce and clavate-spatulate hairs absent; colored a more uniform yellowish brown.

Paratypes, intermediate workers.—Combined lengths of head and thorax of each of the 15 specimens are as follows: 2.37, 2.40, 2.51, 2.51, 2.51, 2.53, 2.59, 2.59, 2.59, 2.62, 2.62, 2.64, 2.64, 2.69, and 2.69 mm. Resembling the minors except in size; distinctly less bulging eyes; less anteriorly projecting clypeus; narrower mandibles; less broadly

convex posterior head corners and margin; more pronounced frontal carinae, frontal groove, and ocelli; and presence of a few scattered clavate-spatulate hairs on clypeus and gula.

Paratypes, major workers.—Combined lengths of head and thorax of each of the 2 specimens are 2.81 and 2.87 mm. Resembling the holotype except for their slightly smaller size and absence of prominent brown areas on head and thorax. The eyes are black in these alcoholic specimens, but they become violaceous when dry.

Described from a series of 25 workers collected by the writer at Jorhat, Upper Assam, India, February 22, 1944. The ants were running up and down on the trunk of a tall tree located in a sunny area beside a rice paddy. They were very agile and ran swiftly with a jerky motion. There were indications that the nest was arboreal, although there was no actual evidence to substantiate this view. The writer spent nearly four hours collecting the series of workers which were extremely scarce. Wheeler (1921, p. 115) states that "the thickened bases of the femora of *G. howardi* indicate that this ant can jump like the large-eyed *Gigantopsis destructor* Fab. of the Neotropical Region." The ants which I collected did not jump when they were disturbed but instead veered sharply toward the opposite side of the tree trunk.

Paratypes are to be deposited in The U. S. National Museum, the Museum of Comparative Zoology, at Harvard, and the collection of the author.

Affinities. *G. spatulatus* appears to be closely related to *kalshoveni* Wheeler, but it differs from *kalshoveni* in the following distinct characteristics of the major worker: In proportion to its length, the clypeus is much broader and is subhexagonal in shape; the head is more rectangular and possesses more sharply rounded posterior corners and a nearly posterior border; the thorax in profile appears more slender; the mesoepinotal impression is much broader; the posterior declivity of the epinotum is less steep; the petiolar node is much higher and larger, thicker above, less distinctly cuneate, and its superior border is less sharp; there is a darker body color, the mesonotum, episternum, and dorsum of gaster are brown, and there is a brown postocular crescent. Major workers of *spatulatus*, *kalshoveni*, and *chapmani* have clavate-spatulate hairs on the clypeus and upper surface of the mandibles.

G. spatulatus differs from *G. luzonensis* var. *chapmani* in the following characteristics of the major worker: The overall size is smaller; the thorax appears more slender in profile; the pronotum and mesonotum in profile are less convex; the mesoepinotal impression is deeper; the metanotum is less marked, not broader than long, and the mesometanotal suture is indistinct; the epinotum in profile is more angular; the petiolar node is higher, much thinner in profile, with a much thinner upper border, sharper corners, and a more deeply excized upper border; and there is a brown crescent above and behind the eyes.

The following key should serve to separate readily the major workers of five of the six known forms of *Gesomyrmex*:³

³Workers of the typical *luzonensis* Wheeler are apparently unknown.

1. Hairs on front and clypeus bifid or multifid at their tips. **chaperi** André
Hairs on front and clypeus not bifid or multifid at their tips; those on clypeus
clavate with spatulate tips. 2
2. Petiolar node as thick above as below in profile, its superior border rounded
and entire. **howardi** Wheeler
Petiolar node not as thick above as below, its superior border excized. 3
3. Mesonotum distinctly broader than long, very convex in profile, with
anteriorly curved posterior suture. **luzonensis** var. **chapmani** Wheeler
Mesonotum not broader than long, much less convex in profile, with straight
posterior suture. 4
4. Petiolar node about one and two-thirds times as broad as long, lower than
the crest of the epinotum. **kalshoveni** Wheeler
Petiolar node longer than broad, as high as the crest of the epinotum,
spatulatus n. sp.

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