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**CHIMAERIDRIS, A NEW GENUS OF HOOK-MANDIBLED
MYRMICINE ANTS FROM TROPICAL ASIA
(HYMENOPTERA : FORMICIDAE)**

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SUMMARY

A description is given of the new genus *Chimaeridris*, comprising the new species *C. boltoni* of Sulawesi and *C. burckhardti* of Sabah. The worker is outwardly similar to that of a minor worker or minor-major intermediate of *Pheidole*, except that its mandibles are hook shaped, displaying a form unique within the subfamily Myrmicinae and superficially similar to that of ecitonine army ants in the genus *Cheliomyrmex* and some African driver ants of the genus *Dorylus*. The possibility is raised that *Chimaeridris* is either a slavemaker (presumably, of *Pheidole*) or a specialized predator.

ZUSAMMENFASSUNG

**Chimaeridris, eine neue orientalische Myrmicinen-Gattung mit hakenförmigen Mandibeln
(Hymenoptera : Formicidae)**

Die neue Gattung *Chimaeridris*, mit den neuen Arten *C. boltoni* aus Sulawesi und *C. burckhardti* aus Sabah werden beschrieben. Die Arbeiterin ist äusserlich einer *Pheidole* sehr ähnlich, mit Ausnahme ihrer hakenförmigen Mandibeln, deren Form oberflächlich denen von *Cheliomyrmex* und von einigen afrikanischen Treiberameisen der Gattung *Dorylus* gleicht. Es ist möglich dass *Chimaeridris* eine Sklavenräuberin ist (vielleicht mit *Pheidole* Sklaven), oder eine spezialisierte Jägerin.

INTRODUCTION

Intensive collecting of ants in more remote regions of the tropics continues to turn up novel genera at the average rate of one every one to two years. Starting in 1976, for example, the following truly new genera — as opposed to those created during revisions of known species — have been

described: *Cladarogenys* Brown 1976, *Pilotrochus* Brown 1977, *Petalomyrmex* Snelling 1979, *Protalaridris* Brown 1980, *Baracidris* Bolton 1981, *Ishakidris* Bolton 1984, *Indomyrma* Brown 1985, and *Epelysidris* Bolton 1987 (reviewed in HÖLLDOBLER and WILSON, 1990). I report here the discovery of another myrmicine, *Chimaeridris*, which in some respects is the most surprising of all the ants discovered during the past twenty years. To put the matter metaphorically, the worker caste has a body and head capsule of *Pheidole* and the mandibles of certain army ants.

Chimaeridris Wilson new genus

Diagnosis, worker

A small ant closely similar to the minor worker of many species of *Pheidole*. It possesses a 12-segmented antenna and 3-segmented club and it displays the same general body form, but with the following differences:

(1) The head capsule and antennae are disproportionately large relative to the rest of the body. In fact, the capsule is about that which would be expected of a true minor-major intermediate in *Pheidole* (a completely dimorphic genus).

(2) The mandible is unique within the Myrmicinae: hook-shaped, that is, strongly incurving and tapered to a sharp point; in addition it bears a large additional dorsoventrally flattened tooth at its basal corner. A broad, deep groove, demarcated along each side by a sharp ridge, extends from near the apex to the base of the mandible, where it passes underneath the basal tooth.

Genotype: *Chimaeridris boltoni* Wilson.

The following description of the two known species of *Chimaeridris* follows the sequence of characters used in the ongoing and still unpublished revision of the genus *Pheidole* by W.L. BROWN and the author. Also, the measurements are the standard ones now generally employed in ant taxonomy; they are capitalized here to denote this usage.

Chimaeridris boltoni Wilson new species (fig 1)

Worker, holotype

Head Width (exclusive of eyes) 0.62 mm, Head Length 0.64 mm, Scape Length 0.54 mm, Eye Length 0.12 mm, Pronotal Width 0.34 mm.

Worker, paratype

Head Width (exclusive of eyes) 0.56 mm, Head Length 0.60 mm, Scape Length 0.54 mm, Eye Length 0.10 mm, Pronotal Width 0.32 mm.

Mandibles unique, as described in the generic diagnosis and shown in *Figure 1E*. The basal mandibular tooth broader and more bluntly tipped than in *C. burckhardti* (compare *figs. 1E* and *2B*). Dorsal surface of clypeus shallowly convex (in holotype the center of the surface is slightly depressed); the median half of its anterior border straight (paratype) or very feebly concave (holotype), its dorsal surface lined with several irregularly positioned longitudinal rugae or carinulae as shown in *figure 1E*. Frontal triangle well demarcated, flat, and approximately level with the immediately surrounding surface of the head. Frontal lobes narrow and raised at only a slight angle (20°) above the level of the frontal area. The frontal carinae diverge slightly and reach mid-eye level. Hypostomal border bears one blunt tooth on each side level with the mandibular insertion; the apex of each tooth forms an angle of slightly less than 90 degrees. Antennal scape circular to ovoid in cross-section, not flattened. Antennal club 3-segmented, slightly longer than the remainder of the funiculus. Lateral body outline as depicted in *figure 1A*. Seen from directly above, the pronotal border forms a nearly perfect circle. However, when the pronotum is viewed obliquely, that is from above with the body tilted 45 degrees along its longitudinal axis, a pair of low cornicles is evident, with one cornicle each situated near the lateral edge of the pronotal dorsum. Also seen from above, both the petiolar and postpetiolar nodes are relatively narrow, with the postpetiolar node being slightly less than 2X as wide as the petiolar node; neither possesses cornicles or other lateral projections.

Head and mandibles medium reddish brown. Alitrunk and waist a slightly contrasting light reddish brown; appendages (other than mandibles) and gaster brownish yellow. Mandibles smooth and shining; clypeus weakly shagreened and feebly shining. Frontal lobes, frons, and vertex densely and longitudinally rugulose and densely foveolate in the interspaces. Entire remainder of head densely but shallowly rugoreticulate, with orientation of the rugae predominantly longitudinal (especially so just mesad of the eye); interspaces densely foveolate, with the foveolae prominent enough to render the rugoreticulum difficult to see on some portions of the head surface. Dorsal surface of the pronotum and mesonotum bear a more elevated and obvious rugoreticulum, again with the interspaces strongly foveolate. Remainder of alitrunk densely foveolate, with no rugae. Waist foveolate; foveolae shallower on postpetiole than on petiole and alitrunk. Gaster shagreened (i.e. with extremely fine roughening of the surface) and sub-opaque. Almost all of body and appendages moderately pilose, as depicted in *figures 1A* and *1E*.

Holotype: Dumoga-Bone National Park, Sulawesi Atara, Indonesia; rain forest, litter sample, plot A, top left; P. M. Hammond February 10, 1985; specimen placed in the British Museum (Natural History). *Paratype*: same locality as holotype; lowland rain forest, 250 m, flood refuse in gully; P. M.

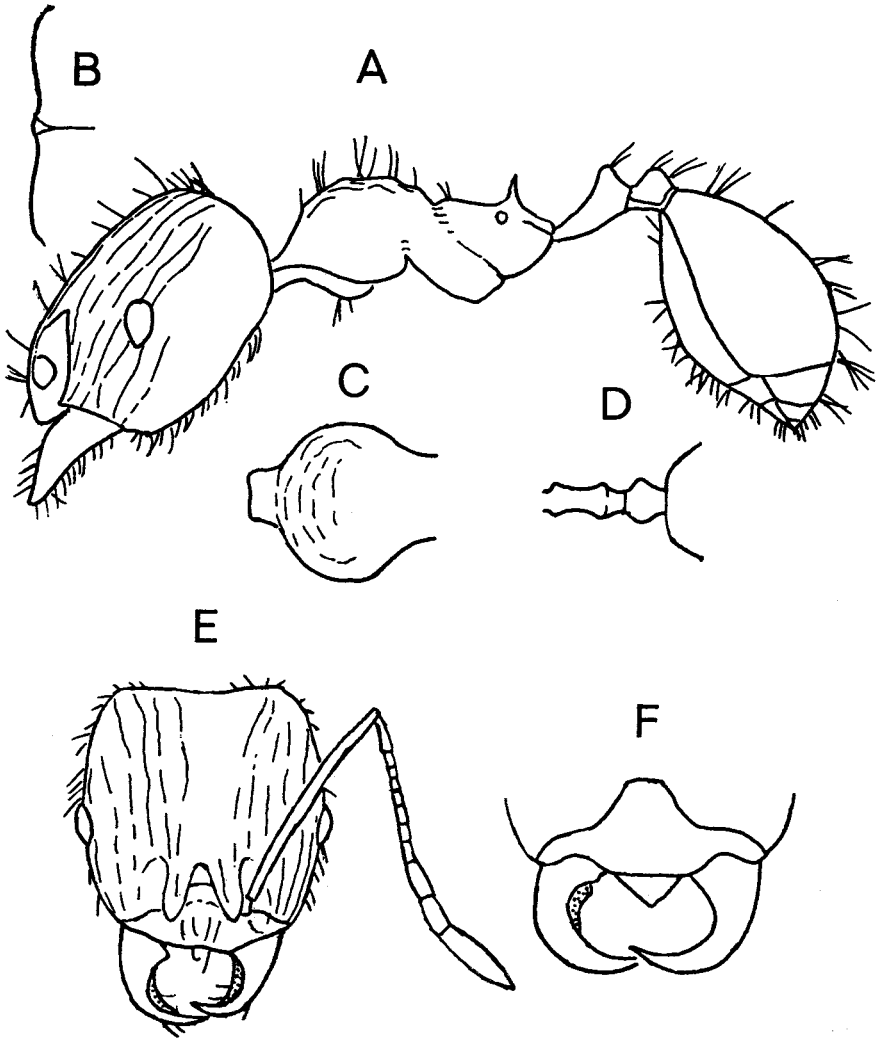


Fig. 1. — *Chimaeridris boltoni* holotype. A, side view of body; B, hypostomal border; C, dorsal view of pronotum; D, dorsal view of petiole and postpetiole; E, full-face view of head; F, clypeus, labrum, and mandibles anterior oblique view.

Abb. 1. — *Chimaeridris boltoni* Holotypus. A, Seitenansicht des Körpers; B, Rand des Hypostomus; C, Dorsale Ansicht des Pronotums; D, Dorsale Ansicht von Petiolus und Postpetiolus; E, Frontalansicht des Kopfes; F, Clypeus, Labrum und Mandibeln, Frontalansicht von unten.

Hammond January 17, 1985; specimen placed in the Museum of Comparative Zoology, Harvard University.

This species is named for Barry Bolton in recognition of his wide-ranging and important studies on the Old World tropical ant fauna.

Chimaeridris burckhardti Wilson new species (fig. 2)

Worker, holotype

Head Width (exclusive of eyes) 0.46 mm, Head Length 0.50 mm, Scape Length 0.40 mm, Eye Length 0.08 mm, Pronotal Width 0.24 mm.

Known only from the holotype. *C. burckhardti* shares the diagnostic generic character states with *C. boltoni* described earlier, and differs from it as follows (consult *figure 1* for illustration of most of these traits) :

- (1) Smaller overall size.
- (2) Proportionately larger head.
- (3) Basal tooth of mandible overall narrower and more acute at tip.
- (4) Occipital border more strongly concave.
- (5) Promesonotum more strongly convex, its dorsal surface more elevated relative to that of the propodeum, and its dorsal border smoother in side view.
- (6) Propodeal spine a short tooth only slightly longer than the propodeal spiracle is wide (in *C. boltoni* it is several times longer than the spiracular width and about as long as the posterior propodeal face).
- (7) A generally much lighter sculpturation. No rugoreticulum is present, and foveolae are absent over the body except for the propodeum and posterior margin of the katapisternum; hence most of the body is smooth and shining. Abundant costulae (low ridges) occur over all of the head, arranged in concentric circles away from a center at the antennal fossa to a distance halfway to the eye, and mostly in parallel longitudinal rows elsewhere. The clypeus bears two horizontal costulae on each of its lateral wings, in contrast to several longitudinal costulae in *C. boltoni* (see *figs. 1E* and *2B*). The promesonotum, petiole, postpetiole, and gaster are mostly smooth and shining.
- (8) Entire body and all of appendages concolorous brownish yellow.

Holotype (unique): Liwagu Trail, Mt. Kinabalu, 1500 m; Ivan Löbi and Daniel H. Burckhardt May 21, 1987; specimen placed in the Muséum d'Histoire Naturelle, Geneva.

This species is named for Daniel Burckhardt, who helped collect the holotype and generously made it available for the present study.

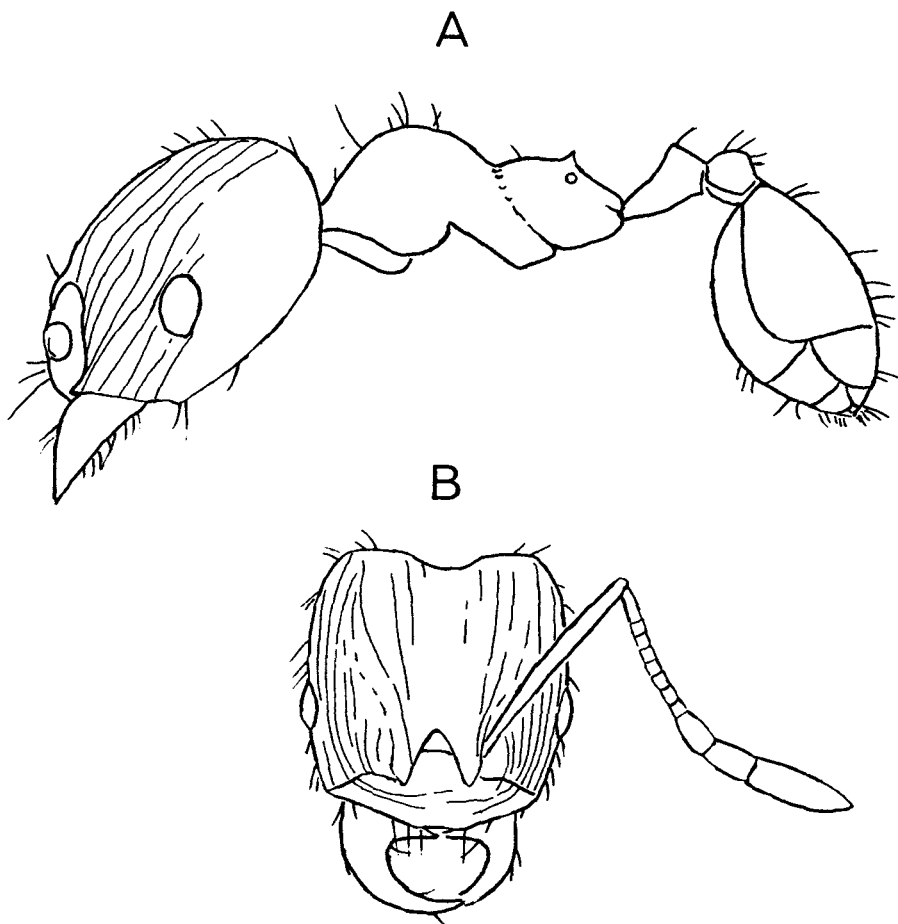


Fig. 2. — *Chimaeridris burckhardti* holotype. — A, side view of body; B, full-face view of head.

Abb. 2. — *Chimaeridris burckhardti* Holotypus. A, Seitenansicht des Körpers; B, Frontalansicht des Kopfes.

DISCUSSION

Chimaeridris is evidently a derivative of *Pheidole*, the most species-rich and abundant of all ant genera and, with *Camponotus*, the most geographically widespread. The external surface of the body posterior to the head is that of a typical small minor worker of *Pheidole*. The antenna is also typical of *Pheidole*. The head capsule is characteristic of *Pheidole*, except for its large size proportionate to the body. In fact, it is roughly what we would expect from

a true intermediate caste in *Pheidole*—except that such is not known with certainty to exist (the “medias” of the *subdentatus* group, including *centeoti* and *tepicana*, are actually small majors). But when we come to the mandibles, the difference is total. The minor workers of all known *Pheidole* species have typical myrmicine mandibles, with a broad flat blade and a more or less straight masticatory border lined with from 6 to about 12 small teeth (the number varying according to species). In *Chimaeridris*, however, we encounter a radical departure. Not only are the *Chimaeridris* mandibles totally different from those of *Pheidole*, they are unlike anything known within the remainder of the large subfamily Myrmicinae, comprising 153 living and 12 extinct genera. The closest approach I know to their general form are the mandibles of the media caste of *Cheliomyrmex*, which are primitive New World army ants in the subfamily Ecitoninae, as well as African driver ants in the genus *Dorylus*. This resemblance is certainly the result of convergence. The result in the newly discovered myrmicine genus is an evolutionary chimaera.

It is possible that the *Chimaeridris* mandible was derived from the *Pheidole* major mandible. The majors of virtually all *Pheidole* species have a broad, flat mandibular blade, bearing a basal tooth and (often) a subbasal tooth in serial order and a subapical and apical tooth, also in serial order. The intervening masticatory border is straight, sharp, and either bears a few irregular low teeth or (more typically) is edentate. The *Chimaeridris* mandible could have been derived from this general form by an inward collapse of the center of the masticatory border, a hollowing out of the border to form a large groove, and an elimination of the subbasal and subapical teeth. It might be argued that if this interpretation is correct, the principal *Chimaeridris* trait is only a single derived character state, throwing the validity of the genus in doubt. The counterargument, on which I have proceeded, is that the mandible form comprises a whole complex of character states. It distinguishes *Chimaeridris* as fully from *Pheidole* as *Polyergus* from *Formica* or *Harpagoxenus* from *Leptothorax*.

The obvious question that follows is: what do the *Chimaeridris* do with their mandibles? It seems likely that the ants have undergone some kind of remarkable specialization in the way they gather energy. Two possibilities come to mind. One is that *Chimaeridris* are slavemakers, perhaps raiding colonies of *Pheidole*. This hypothesis gains some credence from the possession of saber-shaped mandibles by the slavemaking genera *Polyergus* and *Strongylognathus*. While not altered into the hooks of the *Chimaeridris* kind, the mandibles of these ants are narrow, sharply pointed, and used to pierce the bodies of defending workers. That the *Chimaeridris* workers do indeed constitute a fighting caste may be further indicated by their proportionately large heads. Yet—no slavemaking ant species has been discovered in the tropics to the present time.

The second possibility is that *Chimaeridris* are specialized predators. They may either attack a narrow range of unusual prey, utilize novel hunting tactics, or both. Such is the case for many ponerine and myrmicine genera that have narrowed their mandibles and replaced the ordinary teeth of the masticatory borders with one to several long, spike-like teeth.

Until living colonies can be studied, the use *Chimaeridris* put to their mandibles will remain one of the more intriguing mysteries in the natural history of the ants.

Reference

HÖLDOBLER B., WILSON E.O., 1990. — *The Ants*. Harvard University Press, Cambridge, MA. (In press).
