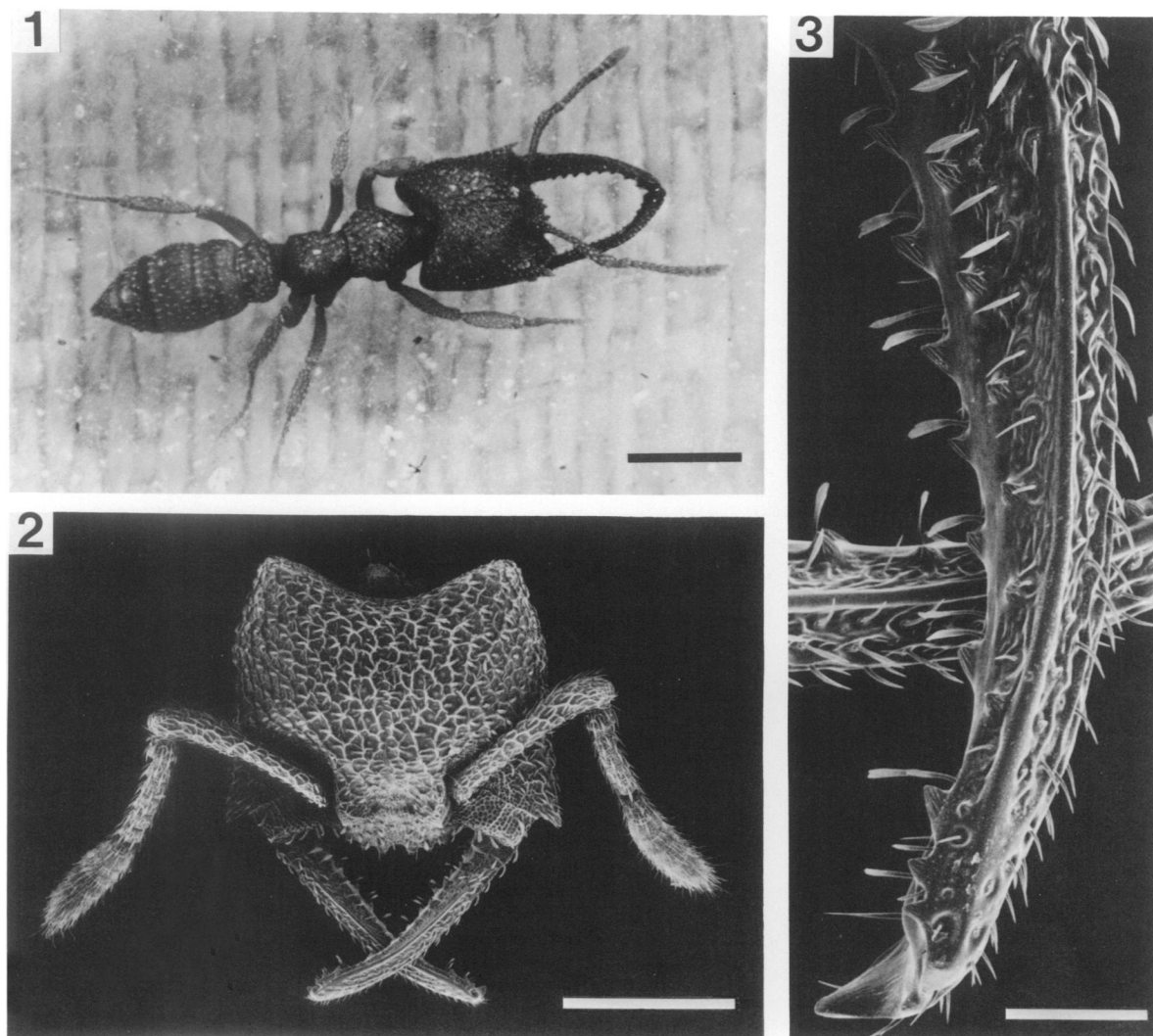


Mandibles that Snap: Notes on the Ant *Mystrium camillae* Emery

Most ants have mandibles with conservative morphologies. However, some have evolved particular mandible forms that serve specialized behavioral functions. The most extreme morphologies are generally found in the tropics; ants of the rarely collected genus *Mystrium* are an example. *Mystrium* workers can be readily distinguished from other amblyoponine ants by their very broad heads, variously modified body hairs, and long mandibles with truncate, somewhat spoon-shaped tips (Menozzi 1929; Figs. 1–3). I have found that workers of the Southeast Asian species *Mystrium camillae* strike at invertebrates by snapping their mandibles past each other. This is a unique defensive strategy for ants and is convergent with the strategy used by soldiers in some genera of the termite family Termitidae, such as *Termes* and *Capritermes* (Deligne *et al.* 1981).

I collected *Mystrium camillae* at Samunsam Wildlife Sanctuary in secondary forest, and at Bako National Park in heath forest (both localities in the First Division of Sarawak), as well as in primary rainforest at Tangkoko Batuangus Reserve (Northern Sulawesi, Indonesia). All the sites were at or near sea level. At Samunsam Wildlife



FIGURES 1–3. Morphology of *Mystrium camillae* (Samunsam series). 1. A live individual (scale bar = 1.0 mm). 2. Electron micrograph of the head (scale bar = 0.5 mm). 3. Inner surface of mandible showing tooth rows and mandible tip (scale bar = 0.1 mm).

Sanctuary a group of 29 workers with brood (but no queen) was taken from a moist humus layer between two planks. At the other two sites scattered workers without brood were collected from large logs in the zorapteran stage of decomposition (Wilson 1959). The workers from Samunsam were maintained in captivity for one month in an $8.5 \times 13.5 \times 3.5$ cm plastic box with a transparent lid. I provided a substrate of slightly moistened soil and bits of wood. Workers clumped together with brood; the location of these clumps often shifted.

Other members of the tribe Amblyoponini are known to be obligatory predators (Brown 1960); many *Amblyopone* species specialize on chilopods (Gorwald & Levieux 1972). Previous authors have presumed the *Mystrium* ants are predaceous, although no information on feeding habits is available (Brown 1960).

When disturbed by a small invertebrate, an *M. camillae* worker often shifted position so that its mandibles were immediately off to the side of the quarry. The mandible tips were then pressed together until the pressure applied became so great that the mandibles suddenly snapped past each other, and the blunt tip of the mandible of the side opposite the animal slammed into it like a fist. Small invertebrates were knocked 0.5–3.0 cm by the impact, disorienting the animal and sometimes stunning it for several seconds.

Arthropods receiving this treatment included isopods less than 4 mm long, brown velvet mites, small beetle larvae, termite workers and soldiers (representatives of several genera provided), and ant workers (*Pheidologeton* spp. and *Monomorium* sp.). *M. camillae* workers ignored the individuals they had just struck, even if the arthropod had been momentarily stunned. The captive ants tended to retreat without striking when they were disturbed by very fast-moving invertebrates or those much larger than themselves, such as earthworms, diplopods, scolopendromorph and geophilomorph chilopods, large isopods, and entombyrid collembola.

The observation that *M. camillae* workers strike at workers of other ant species, and even at a forceps tip, suggests this behavior has a defensive function. It is possible that workers also use the striking behavior to capture prey. However, it is unlikely that the ants could use this technique to subdue invertebrates larger than themselves; most amblyoponine ants specialize on such prey (Wilson 1971).

The snapping technique is probably well suited for dealing with prey (or enemies) in confined spaces. The greatly reduced eyes (*M. camillae* workers are blind), shortened, stocky bodies, and highly modified pilosity of *Mystrium* workers suggest that the ants are hypogaeic, and my observations in the field and laboratory confirm this. In the narrow confines of subterranean passageways, it may often be impossible to maneuver to sting prey. A lateral blow from the mandibles is likely to slam the quarry directly into the side of the passageway, increasing the likelihood that the prey will be stunned or killed.

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