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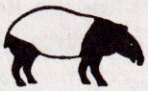

Observations on *Lophomyrmex* ants from Kalimantan, Java and Malaysia

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Abstract. Workers of the myrmicine genus *Lophomyrmex* prey on small arthropods, which they catch singly. Prey are rapidly incapacitated by sawing off limbs and other body parts with the finely serrate mandibles. Recruitment occurs to large dead arthropods, vertebrate faeces, and other unwieldy foods. Trunk trails are formed by *L. bedoti* and possibly *L. opaciceps.*

INTRODUCTION

The fauna of Southeast Asia includes over 100 genera of ants (see Brown 1973). Ecological and behavioural information is lacking for a surprising number of these groups. I report here on one such genus that is common throughout much of the region.

Six species of *Lophomyrmex* have been described (see Viehmeyer 1922; Ettershank 1966). All have a monomorphic worker caste. This myrmicine genus ranges from India through Malaysia and Indonesia; one species is known from Taiwan. My experiences with the ants suggest they are most common in secondary forests, although they are also found in primary rain forests. Moist gulleys often harbour vigorous populations.

STUDY SITES

My detailed observations on *Lophomyrmex* were made on *L. bedoti* at Pleihari Martapura Reserve (Kalimantan Selatan, Indonesia), and the discussion that follows largely concerns the ants from this locality. Additional observations on this species were made at Bukit Timah Nature Reserve

(Singapore) and on Penang Hill (Penang, Malaysia). I also made observations on *L. opaciceps* from Ujung Kulon National Park (Western Java).

Voucher specimens of *Lophomyrmex* have been deposited in the Museum of Comparative Zoology.

Profile of a worker of *Lophomyrmex bedoti*. The bar represents 0.5 mm.

RESULTS

Nest structure

Brood chambers were located at the Pleihari Martapura reserve study site under rocks and tree roots, and in the soil at tree bases. Probably colonies have many scattered chambers; no dealate queen was found during the excavation of 10 chambers. Individual chambers contained as many as 300 workers and numerous brood (usually either mostly larvae or mostly pupae). One chamber contained alate queens.

Foraging pattern

Lophomyrmex workers forage on the ground, primarily in areas with considerable leaf litter cover. The ants at all sites followed trails, departing from them for solitary foraging excursions. Most of these trails were apparently transient. At the Pleihari Martapura Reserve, however, I located several well constructed trunk trails. These had walls along their borders constructed of soil pellets and sand grains, or even complete soil covers. The trunk trails were stable for at least a three-day period, and continuously carried a light

traffic of about 10–30 ants/minute. The ants moved off the trunk trails in a network of columns which often shifted in location.

L. opaciceps ants at the study sites in Java and *L. bedoti* at the Singapore site possibly also used trunk trails; if so these were largely subterranean. Short above-ground sections of trail were present, along which ants carried food. These trail segments had well-built soil walls.

Diet

62 items were extracted from the mandibles of foraging workers at Pleihari Martapura Reserve. The most common items included: isopods, pieces of spiders, termite workers, japygid diplurans, cockroaches, fly and beetle larvae, and pieces of ants (*Camponotus, Pheidologeton* and a dolichoderine). Also present was a snail shell fragment, a pseudoscorpion, an entomobryid collembolan, a dermapteran, a longhorn grasshopper egg, a mogoplistine cricket head, a gall midge (Cecidomyiidae), and a lepidoteran larva and pupa. The greatest measurable lengths of these objects averaged 2.0 ± 1.5 mm, and ranged between 0.3 and 6.0 mm; all were carried by single ants. Ants at the other study sites carried a similar assortment of arthropod material.

At least some of these items represent the remains of prey. Solitary ants at Pleihari Martapura were observed killing a small isopod and a slender, 1 cm long caterpillar; another carried a struggling entomobryid collembolan. In addition, I placed small termite workers, isopods, and geophilomorph centipedes in front of solitary foragers, which the ants often then captured. *Lophomyrmex* ants lack a functional sting (Charles Kugler, *pers. comm.*); the ants immobilise prey by rapidly dismembering them, or cutting into their bodies with their mandibles.

Lophomyrmex workers also harvest a variety of large food items. Ants at all of the study sites accumulated around large dead arthropods and vertebrate faecal material. In Penang workers gathered to harvest the cotyledons from *Elaeocarpus* seeds. A live 2.5 cm caterpillar and a 3 cm scarab grub were attacked after being placed near a trunk trail at the Pleihari Martapura site; the ants recruited to these prey. The prey were eventually killed, and numerous ants fed on them over a period of several hours.

Of several baits presented to the Pleihari Martapura ants, the workers responded strongly only to cooking oil and sugar water; they responded weakly to dried prawns and not at all to mixed canary seeds and cooked rice. Several trails were often established to an oil or sugar bait within minutes after it was put down. Large numbers of ants also moved on the ground in the vicinity of the baits in an apparent search pattern.

Defense

Lophomyrmex ants attack workers of other ant species in the same manner as they capture prey. A sample of *Lophomyrmex* with brood was maintained

in the laboratory to investigate this aggressive behaviour. When workers of *Pheidologeton* or *Pheidole (Pheidolacanthinus)* were dropped among the brood, *Lophomyrmex* ants approached and sheared off the limbs and antennae of the intruder with surprising speed. One *Pheidolacanthinus* worker lost both antennae, four legs, and the tips of both pronotal spines after only 30 seconds of attack by 3 *Lophomyrmex* workers. Observations under a microscope suggest that *Lophomyrmex* ants use their finely serrate mandibles much like saws in cutting away appendages. Since ants in the field sometimes carried ants or ant parts, it is possible that the attack of other ant species often represents predation instead of (or in addition to) defense.

DISCUSSION

Lophomyrmex has been recognised as a member of the *Pheidologeton* genus group (Ettershank 1966). Indeed, the stable trunk trails of *L. bedoti* at Pleihari Martapura Reserve appeared remarkably similar to those of *Pheidologeton* ants. However, *Lophomyrmex* ants forage off the trails singly, rather than in groups, as do at least some *Pheidologeton* species (Moffett 1984). *Lophomyrmex* ants also lack the striking group prey capture and retrieval behaviour of the highly polymorphic *Pheidologeton* ants.

Most ants have a few moderately large to large teeth along their mandibular borders. This generalised mandible dentition (Wilson 1955) is well adapted for maintaining a tight grip on objects, such as prey or other food. The more finely toothed condition of the mandibles of *Lophomyrmex* workers is one of the diagnostic characteristics of the genus (Ettershank 1966). This dentition is better suited for cutting than for gripping and pulling. Apparently slicing off the limbs of prey (and enemies) represents an alternative to seizing and stinging prey.

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