

Notes from Underground

Interactions between a leaf-cutting ant, *Acromyrmex coronatus*, and a Neotropical army ant, *Eciton burchelli*, in La Fortuna, Costa Rica

by
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Neotropical army ants are primarily predators of the immature stages of various social insects. Although leaf-cutter ants (*Atta* and *Acromyrmex* sp.) are one of the dominant and most widespread ants in the same areas, there have been very few reports of predation by army ants on leaf-cutter nests, and *Atta* workers and *Eciton* foragers typically ignore one another during encounters in the field (Rettenmeyer 1963). The main exceptions involve army ants of the genus *Nomamyrmex*, and there have been some reports of predation by these ants on *Atta* and *Acromyrmex* species (Swartz 1998; Sanchez-Pena and Mueller 2002).

Acromyrmex coronatus is a leaf-cutter ant that is common at higher elevation sites in Costa Rica, but absent from lowland sites. Colonies of this ant may have more than 150,000 workers and are relatively populous compared to the other common *Acromyrmex* species in Costa Rica, such as *Ac. volcanus* and *Ac. octospinosus* (Wetterer 1995). *Eciton burchelli* is a common swarm-raiding army ant whose prey includes many arachnids and other insects. This species is most often seen because they form robust columns on the surface even during the day (Schneirla 1971).

Although there are reports in the literature of army ants avoiding *Atta* sp., there are rarely any mention of interactions between the much less populous *Acromyrmex* leaf-cutters and army ants. This article reports on an interaction between *Ac. coronatus* and *E. burchelli* in the province of Alajuela in Costa Rica.

On the afternoon of November 28, 2002, the author encountered columns of *E. burchelli* army ants crossing the Saino Trail of the Arenal Observatory Lodge in the city of La Fortuna, at an altitude of approximately 730 meters. The day was overcast, with intermittent rain and a temperature of approximately 22 C.

There were several *Eciton* columns, with a couple crossing perpendicular to the pathway. About 2 meters away, the author noted what looked to be very small *Pheidole* ants milling on a

flat rock with whitish larvae and pupae. There were also lines of *Eciton* moving along one side of the path.

On the opposite side of the path was a line of *Ac. coronatus* leaf-cutter ants. The traffic was relatively light, with an ant passing a fixed point about once every 10 seconds or more. The author noticed that at least one *E. burchelli* column bisected the *Ac. coronatus* line as the army ants moved to the grass lawn beyond.

The author noted several interactions between *Ac. coronatus* foragers (none laden with foraged material) and *E. burchelli* workers. In one case, a small leaf-cutter worker encountered an army ant worker. The leaf-cutter made a short lunging motion in the direction of the other ant, whereupon the army ant hurriedly increased its pace along the trail. Two other army ants then came upon the same *Ac. coronatus* worker and antennated it at almost at the same time. The leaf-cutter stood very still and seemed to lay flat against the ground, with its legs folded and held close to the body. The two army ants also stopped, then tried to quickly move around the worker. At this point, the leaf-cutter continued on its way. In all cases, the *Eciton* workers did not display any aggressive behavior against the passing leaf-cutters, but instead seemed to be repulsed by them.

Because of heavy rains the next day, the author was unable to determine the nest location of the *Ac. coronatus* ants. There was also no evidence of the *E. burchelli* army ants on the pathway.

Speculation

The ability of *Atta* colonies to deter attacks from army ants is understandable, given that mature nests of these ants may include several million inhabitants and large numbers of aggressive soldiers. On the other hand, *Acromyrmex* colonies seldom reach more than a few thousand in population, and the ability of these ants to escape predation by army ants that number in the millions is notable. So what then is the factor which helps these ants to avoid the attention of *Eciton*? Perhaps..

Certain areas of the cuticle of fungus growing ants are coated with filamentous bacteria from the genus *Streptomyces*, which provide an antibiotic that is used against pathogenic fungi in the ant gardens (Currie et al. 1999). It is intriguing to hypothesize that the occurrence of such surface characteristics might provide additional functionality to the fungus growing ants, either directly repulsing predation by other ants, or providing indirect deterrence by associating all fungus growing ants with the large *Atta* leaf-cutters. Further studies might shed more light on these possibilities.

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