

convincing explanation for the brood synchronization in *L. japonica*.

The term "army ant", as was introduced by Wilson (1958), includes a number of ant species that live in temporary nests and attack and retrieve the prey co-operatively, e.g., *Leptogenys diminuta*. In this species, however, scout ants search for food solitarily and recruit a group of workers from the nest to the place where prey has been localized. The raiding workers form a distinct group that is not connected to the bivouac by a continuous column of workers (Attygalle et al. 1988). Since the search for food is done solitarily, the foraging behavior of *L. diminuta* differs from the hunting strategy of real army ants in an important feature (Fletcher 1973).

*Leptogenys* sp. 1 performs the typical army ant behavior patterns:

1. The monogynous colonies consist of several ten thousands of individuals.
2. The raids of *Leptogenys* sp. 1 are coordinated interactions of many thousands of workers that are not directed to specific food sources by successful scouts.
3. The colonies stay in the same site for only a few days. The ants do not build a fixed nest and modify the substrate only very little to a low extent.

Ant species like *Leptogenys* sp. 1 that do not spend much energy on nest building activities may abandon their nest sites frequently. However, for monogynous species nest relocations are linked with the risk of losing the single reproductive female, and the energy costs for emigrations are high for large colonies (Smallwood 1982). The frequent nest relocations in army ants are considered to be advantageous because the colonies are often migrating to new feeding sites (Schneirla 1971; Wilson 1971). Topoff and Miranda (1980) demonstrated that the food supply may even have a direct influence on the emigration frequency of army ants.

Franks and Fletcher (1983) analyzed the emigration behavior in *Eciton burchelli*. They demonstrated that similar to *Leptogenys* sp. 1, the choice of a new bivouac site is not made at random. The emigrating *Eciton burchelli* colonies follow a certain geometrical pattern that increases the amount of unraided foraging area.

In *Leptogenys* sp. 1 the emigration distances are similar to the raid distances. Since we never observed that the colonies returned to their previous nest site, we can conclude that a considerable shift of their trophophoric field is achieved by the

nest relocations. The migratory behavior presumably prevents the area close to the nest site from food depletion.

In spite of the similarities there also are differences between the behavior of *Leptogenys* sp. 1 and the lifestyle of the ecitonine and doryline swarm raiders. Synchronized broods and correlated regular changes between migratory and stationary phases, which are lacking in *Leptogenys* sp. 1, are often considered to be typical for army ants. But we have to point out that the brood cycle of some ecitonine species is not as regular as in *Eciton burchelli* and *E. hamatum* (Rettenmeyer 1963). The ecitonine swarm raider *Labidus praedator* sometimes has nonsynchronous broods, and several bivouacs of this species were observed in the same site for months (Rettenmeyer 1963). Also in African driver ants (*Dorylus* (*Anomma*) spp.), emigrations are irregular (Raignier and van Boven 1955) and not correlated to the brood condition (Gotwald 1978).

The colony size of *Leptogenys* sp. 1 is large, but does not reach the numbers of several hundred thousands or more workers that are attained in species of the Ecitoninae and the Dorylinae (Wilson 1971).

The queen is primarily wingless in all army ants as well as in *Leptogenys* sp. 1. The morphological differences between the workers and the queen are not very pronounced in *Leptogenys* sp. 1, whereas in the colonies of Dorylinae and Ecitoninae, these differences between the workers and the dichthadiiform queens, which have a huge gaster, are enormous. Workers that guard the queen during emigrations (Schneirla 1971) are not found in *Leptogenys* sp. 1. While the workers of most ecitonine and doryline species are polymorphic, *Leptogenys* sp. 1 workers are monomorphic. A narrow range of size is also found in the dorylines of the genus *Aenictus* (Schneirla and Reyes 1966).

Recent field studies (Franks 1982; Franks and Fletcher 1983) and the data collected by Willis (1967) permit a comparison between the *E. burchelli* average swarm raid and the average foray in *Leptogenys* sp. 1. The raid of *Leptogenys* sp. 1 attains a similar width, but is much shorter and advances much slower than the foray of *E. burchelli*. The swarm raid of this ponerine ant species contains only about one-fifth of the workers that may be involved in the raids of *E. burchelli*.

Whereas *E. burchelli* colonies generally produce one swarm per day, the colonies of *Leptogenys* sp. 1 often conduct two or more raids each night. The nightly raids of a colony of *Leptogenys* sp. 1 cover