

The Ant Tribe Cephalotini

The myrmicine ant tribe Cephalotini is an exclusively arboricolous New World assemblage containing approximately 110 species (Kempf 1951, 1958, 1963, 1964, 1973). So far as known, all of the species are distinguished from all other ants by the peculiar mushroom-like structure of their proventriculus. The external appearance and defensive behaviour of most of the advanced species would seem to justify referring to the cephalotines by the convenient vernacular name 'turtle-ants'. In his latest conspectus, Kempf recognized the following four genera: *Procryptocerus* Emery (thirty-four species); *Cephalotes* Latreille (four species); *Eucryptocerus* Kempf (four species); *Zacryptocerus* Wheeler (seventy species; = *Paracryptocerus* Emery, = *Hypocryptocerus* Wheeler).

Zacryptocerus is the largest, geographically most widespread and most diverse of the genera. It also contains the anatomically most modified forms. Several behavioural studies have previously been conducted on *Zacryptocerus*. Coyle (1966) demonstrated the existence of two alternative defensive techniques among various Central American species: some species emit a volatile chemical secretion from the tip of the abdomen, which can be tipped forward over the thorax due to lowering and flattening of the propodeal and petiolar dorsa. Others rely on heavy spine formation and quick movements for defence. Creighton and his co-workers (Creighton & Gregg 1954; Creighton 1963; Creighton & Nutting 1965; Creighton 1967) studied *Z. rohweri* and *Z. texanus*, which occur in the extreme south-western United States. They established the fact, which had been suspected by previous authors but not adequately proved, that the soldiers and queen use their shield-shaped heads to block the narrow nest entrances and even to 'bulldoze' opponents out of the nest passageways. Creighton et al. also discovered that the two *Zacryptocerus* collect certain types of pollen, in addition to aphid honeydew and crushed insect tissue, and are able to survive and reproduce on this food item alone. So far as is known pollen feeding is still unique to these ants. No evidence has yet been found of its occurrence in other kinds of ants, including the cephalotines *Cephalotes atratus* (Mary Corn, personal communication) and *Z. varians*.

The Natural History of *Zacryptocerus varians*
Zacryptocerus varians ranges from the tip of southern Florida, including the Florida Keys,

to the Bahamas, Cuba and Jamaica. It appears to be a West Indian species that has just managed to colonize the most tropical portion of Florida, and it is the only cephalotine known from the eastern United States. *Z. varians* has been found nesting in dead branches of a variety of trees, including *Bauhinia*, the sea grape *Coccoloba*, and (especially in the Florida Keys) the red mangrove *Rhizophora mangle*. Colonies have also been found in stems of tall grasses and sedges, including sea oat (*Uniola paniculata*) and saw grass (*Cladium jamaicensis*). In southern Florida winged forms have been encountered in the nests during the summer months of June and July. The author's experience in the field in Cuba and Florida indicates that the species is exclusively nocturnal in nature. However, workers come to forage both during the day and night under conditions of constant illumination in the laboratory.

'Mature' colonies, that is, colonies large enough to produce winged queens, normally contain from one to several hundred workers and soldiers. Although I have dissected many nests without encountering any mother queen, large numbers of nests have been opened containing a single mother queen, and none has contained more than one such individual. Consequently *Z. varians* can be assumed to be normally monogynous. The queen also appears to be essential for the production of new workers and soldiers. While queenright colonies in the laboratory produced large broods of these castes, queenless colonies reared under identical conditions produced only males, or no brood at all. Although exact censuses of colonies freshly collected in the field have not been made, the ratio of adult minor workers to soldiers is approximately 10:1, a proportion that is maintained in the laboratory (see Fig. 1). Colonies are discrete entities. When workers from one colony are introduced into the nests of another in the laboratory, they are attacked and driven out.

The diet of free-living colonies of *Zacryptocerus varians* is not known, but it can be partly inferred from laboratory studies. In the laboratory the foraging minor workers are totally inept as predators. When workers encounter live insects outside the nest they generally avoid them. The very short mandibles and rigid body form make them physically less capable of pursuing prey even if the behaviour were well developed. Even small aphid nymphs just large enough to fit between the mandibles of the ants