

pattern of head-on solicitation has been observed in *Dolichoderus quadripunctatus* by Torossian (1959). Both queens and workers use the method to obtain eggs from other workers.

**Normal and trophic eggs.** The 'normal' eggs of the queenright colony, i.e. those destined to hatch into larvae instead of being eaten, are probably laid by the queen. The evidence for this conclusion is indirect: in queenright laboratory colonies the eggs always developed into minor and major workers, suggesting that they had been fertilized; whereas queenless colonies either did not produce viable eggs, or else the eggs always developed into males, suggesting that they were unfertilized. As illustrated in Fig. 1, the eggs are very large. Most are 1.1 to 1.2 mm in length, one-quarter or more as long as the queen's abdomen. The rate at which these eggs are laid must also be exceptionally low, because I failed to see a single instance of oviposition in 25.5 hr of observing two queenright colonies. The phenomenon is similar to that noted by Michener (1973) in allodapine bees, in which large egg size is associated with low oviposition rate. Michener notes that small egg size permits the deposit of eggs in batches, so that the brood tends to develop synchronously and can presumably be handled with greater efficiency by the nurse workers. This conclusion is reasonable but does not explain why the eggs of some species are large. The reason in both the allodapines and *Zacryptocerus* ants may be that larger size reduces the rate at which eggs lose moisture,

an adaptation to the dry arboreal nest sites favoured by both the bees and ants.

Trophic eggs are laid by minor workers. It is possible that they are also laid by major workers, even though such oviposition was not seen in this caste, the reason being that major workers comprise such a small percentage of the adult population that the behaviour might have been simply a statistically unlikely event during the cumulative observation period. Major workers, like minor workers, have well-developed ovaries, even in queenright colonies. Trophic eggs laid by minor workers are small, round objects with diameters only about one-fifth the length of the viable (queen-laid?) eggs. They are soft, tend to flatten from their own weight when placed on the nest floor, and are easily punctured. The minor workers, being unable to bend their abdomens forward in the usual manner of ants, hold their bodies straight and deposit the eggs on the nest floor. The laying worker then backs up, seizes the egg in its mandibles, and excitedly seeks the larvae. It thrusts the egg down onto the head of the first larva encountered and, if the larva reacts, holds the egg in place until it is mostly or entirely consumed. If the larva does not respond, the worker lifts the egg up and places it on the head of a second larva, continuing the process until a willing recipient is encountered.

**Fate of infrabuccal pellets.** Very little has been reported concerning the disposal by ants of infrabuccal pellets, which are the compacted pellets of solid material eaten but not passed

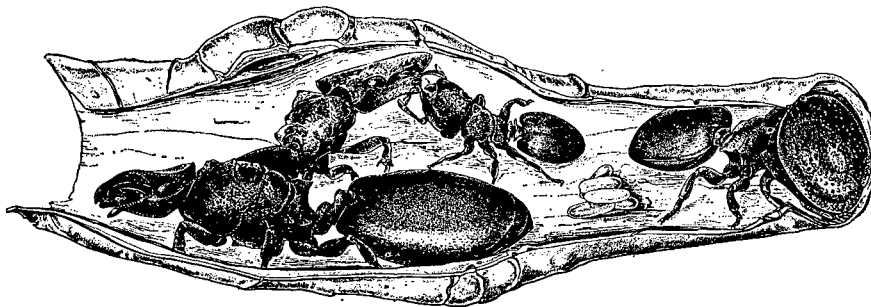


Fig. 1. The three female castes of the ant *Zacryptocerus varians* are included in this colony fragment, which occupies a typical nest cavity in a dead stem of the red mangrove, *Rhizophora mangle*. The nest queen rests on the floor of the cavity to the left, while on the right a large major worker blocks the nest entrance with its saucer-shaped head (an eye and an antenna can be seen just beneath the left margin of the expanded, circular frontal lobes). To the rear of the queen another major worker receives regurgitated liquid from a minor worker. (Drawing by Turid Hölldobler.)