

During these nest shifts a consistent route often developed between the old site and the new. The emigrating ants observed in the field also followed a distinct route, which in this case could have been at most a few centimeters wide.

DEFENSIVE BEHAVIOR

Acanthomyrmex notabilis. Foraging minor workers of both *Acanthomyrmex* species were very shy, retreating even after slight disturbances. However, when workers of *Pheidologeton*, *Aphaenogaster*, and *Pristomyrmex* species common in the vicinity of the nest of *A. notabilis* were held in forceps up to the nest entrance, minors soon emerged to bite at the forager and sometimes grapple with it; the *Pristomyrmex* evoked the strongest response. Following such an experiment, no ants emerged to forage for at least five minutes. After withdrawing each "intruder," I could barely make out the head of a major worker just within the entrance, where no major had been previously. The major bit at a forceps tip that I pushed inside the entrance, holding on so tenaciously I could pull it from the nest.

Captive workers could likewise be provoked to seize a forceps tip, particularly when the worker was in or near the brood area. Biting ants commonly held on so tenaciously that they could be pulled free from the ground. When pulled free, they usually released their grip within a few seconds, unless their tarsi still clung to a piece of substrate, such as a bit of soil—in which case majors in particular would maintain a grip for as long as a minute (fig. 3). Minors gripping a loose object usually rotated that object forward beneath them, while majors did not. Possibly this is explained by a tendency for minor workers to pull backwards when grappling with an intruder.

Captive *A. notabilis* workers fled from *Solenopsis* and *Monomorium* ants, and there was a rapid exodus of the ants and brood if an intruder entered the nest area. However, if the intruders first had their gasters excised, the *A. notabilis* ants behaved much as they did towards single *Pheidologeton diversus* minor workers, which lack the severe stings of *Solenopsis* and *Monomorium*. In this case an *A. notabilis* minor often stood its ground for several seconds, either repeatedly biting at the intruder, or swinging its gaster under its body towards the intruder, or both. A major most commonly first