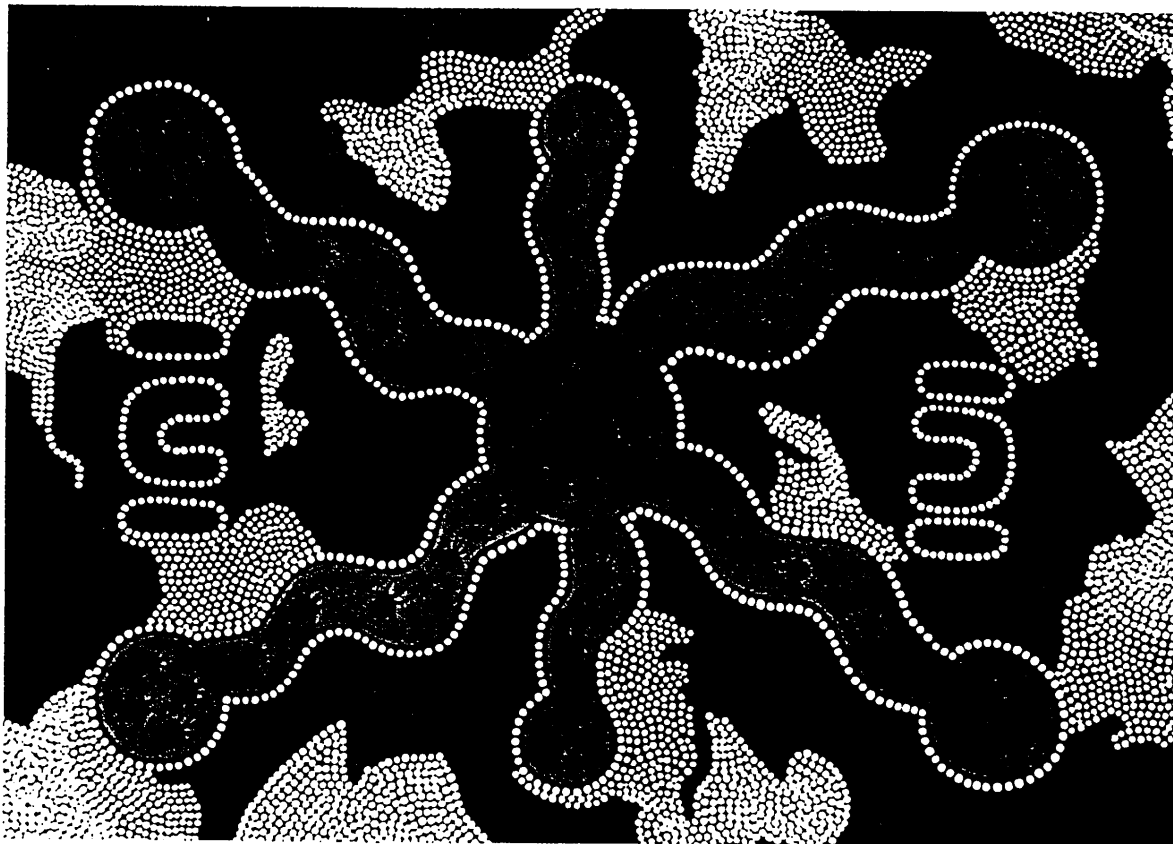


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DO PHORID DECAPITATING FLIES IMPACT FIRE ANT POPULATIONS THROUGH MODIFICATION OF COLONY BEHAVIOR?

S. D. Porter

USDA-ARS, CMAVE, P.O. Box 14565, Gainesville, FL 32604, USA

Phorid flies in the genus *Pseudacteon* are called decapitating flies, because their larvae have the unusual habit of decapitating fire ant workers and using the empty head capsule of their host as a pupal case. Attacking *Pseudacteon* flies distinctly modify the behavior of fire ant workers. A single fly usually stops or greatly inhibits the foraging efforts of hundreds of workers within 2-3 minutes (Feener & Brown 1992, Orr *et al.* 1995, Porter *et al.* 1995). As soon as fire ant workers recognize the flies, they rapidly retreat into exit holes or find cover. Other workers will "freeze" or curl into a stereotypical c-shaped defensive posture (Feener & Brown 1992) that has only been reported when the ants are under attack by phorids. Attacking flies inhibit fire ant foraging as long as they are present, often for periods of several hours (Orr *et al.* 1995). Natural parasitism rates in fire ant colonies are generally quite low (~1% or less). The cessation of foraging apparently reduces the ability of decapitating flies to parasitize fire ant workers, but it comes at the cost of ceding colony food resources to other species of ants (Orr *et al.* 1995). This loss of food resources should limit colony growth and increase the competition from other ant species, but these effects should be less than the direct costs of undefended parasitism. Populations of imported fire ants in the United States are about 5 times those normally found in South America where these fire ants are native (Porter *et al.* 1997). The cause of this intercontinental difference is unknown; however, escape from natural enemies is a likely explanation because analyses of factors such as climate, habitat, population structure, and cultural practices have not been useful in explaining this difference.

The overall impacts of phorid flies on fire ant populations are unknown; however, they are clearly sufficient to have caused the evolution of phorid-specific defensive behaviors. These behaviors could only have evolved if *Pseudacteon* flies had exerted population-level impacts on the survival of fire ant colonies and/or their rates of sexual production. Fire ant biocontrol efforts offer a unique opportunity to experimentally test the hypothesis that parasitoids, specifically phorid flies (Feener & Brown 1992), are important in structuring the diversity and composition of ant communities by tipping the competitive balance against fire ants (Porter 1998).

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