

Inquiline Roach Responds to Trail-Marking Substance of Leaf-Cutting Ants

Abstract. *Nymphs and females of the roach inquiline, Attaphila fungicola W. M. Wheeler, respond to odor-trail substances of Atta texana (Buckley) and Trachymyrmex septentrionalis (McCook). The ants are more sensitive than roaches to the pheromone.*

Attaphila fungicola W. M. Wheeler is a small, wingless roach that inhabits the fungus gardens of most nests of the Texas leaf-cutting ant or town ant, *Atta texana* (Buckley). It is one of the few inquilines that live intimately with the ant.

Table 1. Response to odor-trail substances of *Atta texana* and *Trachymyrmex septentrionalis* by their workers and females of *Attaphila fungicola*. The response is the number of insects following circular trail 15 cm or more, and is the sum of two replications of ten insects each.

Test insects	Dilution of contents from one poison sac in 1 ml of CCl ₄			
	1	10	10 ²	10 ³
Major worker <i>Atta texana</i> *				
<i>A. texana</i> (mw)†	20	19	12	0
<i>A. fungicola</i> (♀)	20	18	0	0
Minor worker <i>Atta texana</i> ‡				
<i>A. texana</i> (mw)	20	12	0	0
<i>A. fungicola</i> (♀)	16	0	0	0
Worker <i>Trachymyrmex septentrionalis</i> §				
<i>T. septentrionalis</i>	20	14	0	0
<i>A. texana</i> (mw)	16	10	0	0
<i>A. fungicola</i> (♀)	16	2	0	0

*Body length, 10.0 mm; poison sac, 0.9 by 0.65 mm. †Minor workers, mw; ‡Body length, 3.5 mm; poison sac, 0.2 by 0.2 mm. §Body length, 3.0 mm; poison sac, 0.2 by 0.2 mm.

Numerous publications describe inquilines on ant trails, but in no case is it clear that they follow the ant scent.

The bioassay technique described by Moser and Blum (1) was used to measure the response of the roach to trail-marking substances from the poison sac of *Atta texana* and a related ant, *Trachymyrmex septentrionalis* (McCook). Each poison sac was crushed in 1 ml of carbon tetrachloride; the solution was shaken thoroughly and 0.1 ml was applied to a sheet of paper in

a narrow line, describing a circle 15 cm in diameter. Roaches were then placed inside the circle and records made of the number that followed the line for 15 cm or more. To determine the lowest concentration that roaches and ants could detect, similar trials were made with serial dilutions. Female roaches only were used since the male roach has never been found in central Louisiana. The roach specimens were taken from nests of town ants.

The trail-marking substances from the two species of ants were less attractive to the roach than to the ants, but the response of the roach to contents of sacs of equal size from ants of either species was the same (Table 1). Ants and the roach could better detect the odor-trail substance from major than from minor workers of *Atta texana*, evidently because sacs of major workers contained more pheromone.

Roach nymphs of ages 3 weeks, 3 months, and 11 months (growth to sexual maturity takes about 12 months) followed artificial trails as well as did mature females. Five roaches that did not respond to the substance in laboratory tests were *Periplaneta americana* (Linn.), *P. fuliginosa* (Serv.), *Blattella germanica* (Linn.), *Supella supellectilium* (Serv.), and *Parcoblotta* sp.

In the laboratory, the antennae of *Attaphila* moved vigorously but never touched the artificial trail. However, the maxillary palps, which are almost as long as the antennae, were in constant contact with the trail.

The roach has not been found in field nests of *Trachymyrmex*, which are abundant and often superimposed on the larger nests of *Atta*. In the laboratory, roaches survive well in nests of both ants but workers of *Trachymyrmex* are somewhat hostile.

Attaphila fungicola has never been observed on field trails of the town ant, though Bolivar (2) recorded *Attaphila schuppi* Wasm. on trails with workers of *Acromyrmex prob. niger* (F. Smith) in Brazil. Some individuals of *A. fungicola* placed on field trails followed scent but took about 15 minutes to become adjusted.

Although the roach may not use field trails as a mechanism of dispersal, the pheromone may assure continued association of the insects. It may ex-

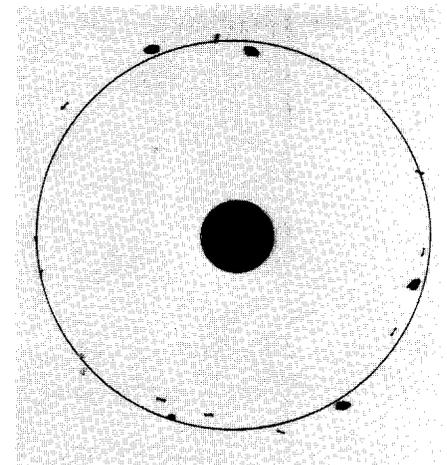


Fig 1. First-instar nymphs and female adults of roach, and minor workers of town ant following artificial trail. Note that insects travel in both directions.

plain why roaches are often found riding on town ant queens during mating flights.

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References

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