

West Indian Subterranean Termite, *Heterotermes* sp. (Insecta: Blattodea: Rhinotermitidae)¹

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Introduction

Heterotermes is a structure-infesting termite genus that accounts for a significant proportion of the damage attributed to subterranean termites wherever it occurs. Three species have been reported from the West Indies including *H. cardini* (Snyder), *H. convexinotatus* (Snyder), and *H. tenuis* (Hagen). Insufficient descriptions, poor museum specimens, and lack of diagnostic characters place the identity of these species in doubt and underscore the need for a taxonomic revision of the genus. Therefore, we have not assigned species names to any *Heterotermes* from the West Indies nor to the species discovered in Florida. General information related to the life history, damage, and management of *Reticulitermes* is applicable to *Heterotermes* and can be obtained from our sister publication on *Reticulitermes*. This report highlights important distinguishing characteristics of *Heterotermes*.

Distribution

Heterotermes is endemic to most of the world's tropics and all of tropical America. This genus has been recorded from almost every island in the Bahamas and West Indies but, strangely, is not endemic to Florida. One exceptional species, *H. aureus* (Snyder), is distributed throughout the lower deserts of northwestern Mexico, southern California, and southern Arizona.

In 1995, a species of *Heterotermes* was collected from a house in Miami, Florida. This was the first record of *Heterotermes* in the eastern United States. It has subsequently been collected from two other residential locations and two warehouses in the same Miami neighborhood. One infestation is only one-half mile from Biscayne Bay. Because of its similarity to *Heterotermes* collected in the West Indies, the predominantly West Indian migrant population of the neighborhood, and proximity to the coast, there is little doubt that these termites were accidentally introduced from the West Indies. As with *Coptotermes*, *Heterotermes* can infest boats. In 1995, a boat docked in Grand Cayman Island contained a thriving on-board infestation of *Heterotermes*.

Miami is the only known locality in tropical America where both *Reticulitermes* and *Heterotermes* coincide. Elsewhere in the world, these two widely distributed genera are geographically isolated. *Reticulitermes* usually inhabits subtropical to cold temperate climates, while *Heterotermes*, with the exception of a few species, is its tropical counterpart.

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Description and Identification

Superficially, soldiers of *Heterotermes* resemble those of *Reticulitermes*. When viewed from above, both genera have rectangular-shaped heads and no obvious distinguishing features except that the soldiers of *Heterotermes* are smaller than those of *Reticulitermes*. Microscopic examination of the mandibles reveals diagnostic differences. The mandibles of *Heterotermes* soldiers are slender and slightly curved near the tip, while the mandibles of *Reticulitermes* soldiers are thicker and curved at both their bases and tips. This configuration allows *Heterotermes* soldiers to cross both mandibles when closed. *Reticulitermes* can barely overlap the tips of their mandibles when fully closed. *Heterotermes* soldiers tend to be more aggressive when provoked and constitute a larger proportion of the termite colony than soldiers of *Reticulitermes* species.

Figure 2. Dorsal views of subterranean termite soldiers. *Coptotermes formosanus* (left), *Heterotermes* (center), and *Reticulitermes flavipes* (right), all from Dade County, Florida.
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Figure 3. *Heterotermes* subterranean termite soldier with mandibles in resting position (top) and fully closed (bottom).
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Figure 4. *Heterotermes* subterranean termite soldiers and workers.
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The alates of *Heterotermes* are about the same size as those of *Reticulitermes flavipes* (total length with wings about 9-10 mm). When compared to body size, the wings of *Heterotermes* are proportionally longer than the wings of *Reticulitermes* species. The upper body surfaces of *Heterotermes* alates are pale yellow-brown to orange-brown, while those of *R. flavipes* and *R. virginicus* are dark brown to black. The bodies of *R. hageni* are brown. Aside from body color, the wing characters of *Heterotermes* are useful to distinguish them from *Reticulitermes*. In *Heterotermes*, the wing texture is smooth, the membrane surface opaque and yellow-brown, and the margin fringed with tiny hairs. In *Reticulitermes*, the wing texture is creased with vein-like patterns, the membrane clear, and the margin without hairs.



Figure 5. *Heterotermes* subterranean termite alates in lateral (top) and dorsal views.

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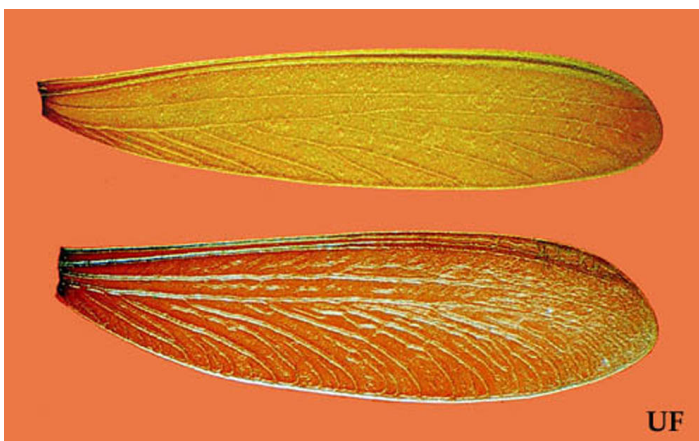


Figure 6. Right fore wing of *Heterotermes* (top) and *Reticulitermes* alates (bottom), subterranean termites.

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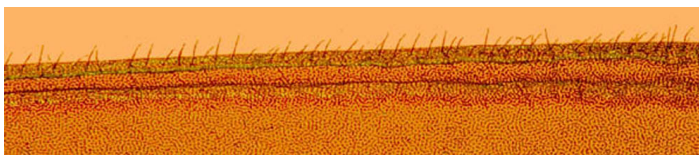


Figure 7. Close-up of *Heterotermes* subterranean termite wing margin showing microscopic hairs.

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Life History

Heterotermes and *Reticulitermes* live in diffuse nests in the soil and share many similarities in colony development and behavior. Some studies suggest that *Heterotermes* colonies have smaller foraging territories but greater colony density per given area than those of *Reticulitermes*. *Heterotermes* dispersal flights occur at dusk or at night when the rainy season commences in May or June. Occasional smaller flights can occur from August through November. Rainfall usually precedes flight activity. Before flights, alates congregate in “staging” areas near the soil surface or in wood galleries above ground.

Damage

Like *Reticulitermes*, damage resulting from a *Heterotermes* infestation can become severe if left untreated. Subtle differences in foraging behavior and biology, however, do exist. *Heterotermes* seems to be better adapted to dry environments than *Reticulitermes*. *Heterotermes* often forage into wood members that are distant from moisture sources and workers transport little or no free water to feeding sites. Even driftwood lying on dry, hot, and sandy beaches is prone to attack by *Heterotermes*. Dispersal flights, foraging tubes, or damage (often shredded and dry in appearance) are usually the first indications of an infestation. *Heterotermes* foraging tubes are lighter in color, narrower, and more circular in cross-section than those of *Reticulitermes* or *Coptotermes*. Like their foraging tubes, the accumulation of fecal spotting on the surface of *Heterotermes*-infested wood is also a beige or cream color. In structural infestations, *Heterotermes* will sometimes openly build very narrow free-hanging tubes from ceilings, shelves, and overhangs.



Figure 8. *Heterotermes* subterranean termite alates congregating beneath a rock before swarm.

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Figure 9. Damage and fecal spotting by *Heterotermes* subterranean termites to wood molding, Miami, Florida.



Figure 10. Damage and fecal spotting by *Heterotermes* subterranean termites in dry framing, Miami, Florida.
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Figure 11. *Heterotermes* subterranean termite damage showing dry and shredded appearance of wood, Miami, Florida.
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Pest Status

Infestations of *Heterotermes* in Miami are infrequent at this time. Having demonstrated successful establishment in Florida suggests that this pest will become more widespread over time. Due to climatic restrictions, the future distribution of *Heterotermes* in the eastern United States will not likely extend far beyond southern Florida.



Figure 12. *Heterotermes* subterranean termite foraging tube dropping from living room ceiling, Santo Domingo, Dominican Republic.
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Figure 13. *Heterotermes* subterranean termite foraging tube on a sheltered bench, Cat Island, Bahamas.
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Management

The same management strategies employed for *Reticulitermes* should be considered for *Heterotermes*. Preliminary research suggests that baiting for *Heterotermes* requires more time than for *Reticulitermes* or *Coptotermes*. Given the small size of *Heterotermes* soldiers and workers, they are apt to penetrate smaller cracks in concrete and masonry that are too narrow for foragers of other subterranean termites to enter.

Selected References

- Jones, S.C. 1990. Delineation of *Heterotermes aureus* (Isoptera: Rhinotermitidae) foraging territories in a Sonoran desert grassland. *Environ. Entomol.* 19: 1047-1054.
- Scheffrahn, R.H., and N.-Y. Su. 1995. A new subterranean termite introduced to Florida: *Heterotermes* Froggatt (Rhinotermitidae: Heterotermitinae) established in Miami. *Florida Entomol.* 78: 623-627.