

DISTRIBUTION OF THE TERMITE GENUS *COPTOTERMES* (ISOPTERA: RHINOTERMITIDAE) IN FLORIDA

RUDOLF H. SCHEFFRAHN AND NAN-YAO SU

University of Florida, Institute of Food and Agricultural Sciences
Department of Entomology and Nematology, Fort Lauderdale Research and Education Center
3205 College Avenue, Fort Lauderdale, FL 33314, U.S.A.

Two non-endemic and highly destructive species of *Coptotermes* Wasmann occur in Florida. In 1980, the Formosan subterranean termite, *Coptotermes formosanus* Shiraki, was first discovered in Florida infesting condominiums along the Atlantic Ocean and the Intracoastal Waterway in Broward County (Anonymous 1980; Koehler 1980). Later, *C. formosanus* was found in neighboring Dade Co. and in central Florida (Orange Co.) and in the western Panhandle (Escambia Co.) (Thompson 1985). A 1987 survey of structure-infesting termites of Florida (Scheffrahn et al. 1988) showed a low incidence of *C. formosanus* in urban areas of the peninsula compared with other pest species. Based on published reports and personal

communications but no voucher specimens, Woodson et al. (2001) added Okaloosa, Hillsborough, Santa Rosa, Palm Beach, Marin, Citrus, and Leon as additional Florida counties where *C. formosanus* is distributed.

The Asian subterranean termite, *Coptotermes gestroi* (Wasmann), was first discovered in Florida in 1996 infesting a storefront in Miami (Su et al. 1997). Originally classified as *C. havilandi* Holmgren, this species was recently synonymized with *C. gestroi* by Kirton & Brown (2003). Since 1996, no additional reports have been published on the distribution of *C. gestroi* in Florida. *Coptotermes formosanus* and *C. gestroi* can be differentiated from each other by soldier (Scheffrahn et al.

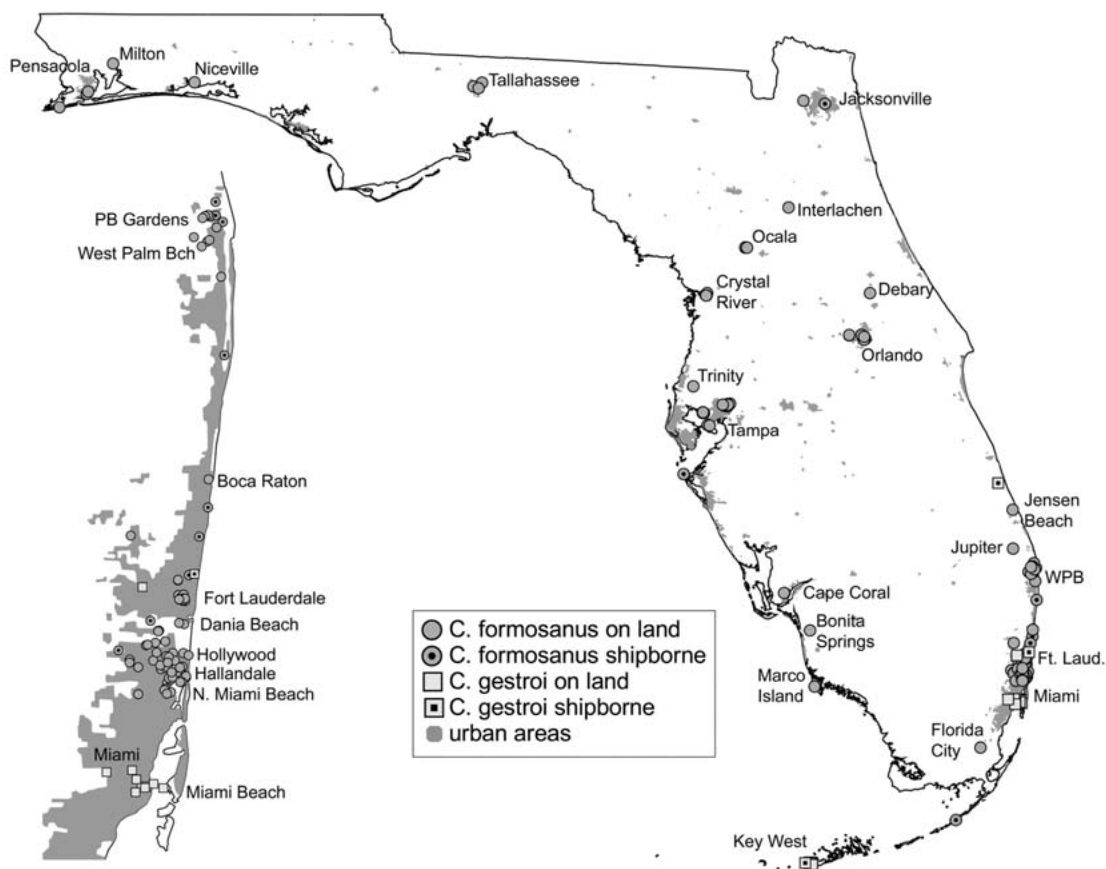


Fig. 1. Distribution of *Coptotermes formosanus* and *C. gestroi* in Florida. Inset on left shows greater detail of the southeast coast. Grey areas represent urbanized land zones.

1990) and imago (Scheffrahn & Su 2000) morphology. Both species separate into different clades when sequences of their respective mtDNA 16S RNA genes are compared (Scheffrahn et al. 2004).

Over the last 19 years, we have directly collected or have received more than 3,000 termite colony samples from throughout Florida including those of the two now well established *Coptotermes* species. We herein report on the current distribution of *Coptotermes* in Florida based on locality records of 168 *C. formosanus* and 35 *C. gestroi* samples. All samples are cataloged and housed in the University of Florida Termite Collection, Ft. Lauderdale Research and Education Center, Ft. Lauderdale, Florida.

The geographical distribution of *Coptotermes* in Florida, including incidences where these species have been collected aboard boats or ships, is mapped in Fig. 1. Most urban centers throughout Florida, with the exception of Pinellas Co. (St. Petersburg), now support populations of *C. formosanus*. *Coptotermes* localities in Florida are listed in Table 1 by county, city, and year of discovery. Including shipborne infestations, *C. formosanus* has been collected from 20 counties and 40 cities in Florida, while *C. gestroi* has been collected in 4 counties and 8 cities (Table 1). All populations of *C. gestroi* are currently restricted to tropical southeastern Florida. Dade and Broward Counties, Florida, are the only geographies worldwide where these two species have sympatric distributions. Both species are exclusively synanthropic in Florida and have only been collected in or within foraging distance of a structure.

The tendency of both *C. formosanus* and *C. gestroi* to colonize boats (<40-m-long) and ships (>100-m-long) likely contributed to the dispersal of these and other *Coptotermes* species from their other ranges to exotic localities, such as Florida (Scheffrahn et al. 2004). Colonies have been observed reaching maturity aboard watercraft and dispersal flights from watercraft could initiate land-based infestations near dockage.

One particular infestation is worth reporting here because it provides compelling evidence for shipboard establishment and movement of *Coptotermes* colonies over long distances. In January 2001, a 29 meter-long yacht docked off the Intra-coastal Waterway in Ft. Lauderdale was found to be infested with *C. gestroi*. Since 1993, the yacht's winter dockage was at the Turtle Cove Marina in Providenciales, Turks and Caicos Islands, British West Indies. Providenciales is some 930 km southeast of Ft. Lauderdale. *Coptotermes gestroi* was first collected in the Turks and Caicos at Turtle Cove in 1990 (R. Scheffrahn, unpubl.). It is very probable that during one or more preceding winters in Providenciales, lighting on the yacht attracted alates during a nocturnal dispersal flight in the Turtle Cove vicinity (*C. gestroi* dispersal flights in Florida and the West Indies occur

TABLE 1. DISTRIBUTION OF *COPTOTERMES* IN FLORIDA BY COUNTY, CITY, AND YEAR RECORDED.

County	City	Year	
<i>Coptotermes formosanus</i>			
Broward	Dania Beach	2001	
	Fort Lauderdale		
	Hallandale	1980	
	Hillsborough Beach ¹	2000	
	Hollywood	1994	
	Lighthouse Point ¹	1998	
	Pembroke Pines	2002	
	Pompano Beach ¹	2001	
	Wilton Manors	2002	
	Citrus	Crystal River	1999
		Marco Island	2003
	Collier	Florida City	2002
		Miami	2004
	Dade	North Miami Beach	1999
Jacksonville ²		2004	
Duval	Pensacola	1985	
	Warrington	1989	
	Escambia	Tampa	1996
Temple Terrace		1991	
Lee	Bonita Springs	2003	
	Cape Coral	2004	
Leon	Tallahassee	2000	
	Holms Beach ¹	2002	
Manatee	Ocala	2003	
	Jensen Beach	1998	
Marion	Islamorada ¹	1986	
	Niceville	2001	
Monroe	Orlando	1985	
	Orange	Boca Raton	2003
Hypoluxo ¹		1985	
Jupiter		1999	
Lake Park		2001	
North Palm Beach		1996	
Palm Beach Gardens		2000	
Riviera Beach		1999	
West Palm Beach		1999	
Pasco		Trinity	2003
Putnam		Interlachen	2004
		Santa Rosa	Milton
Volusia		Debary	2003
		<i>Coptotermes gestroi</i>	
Broward		Fort Lauderdale ¹	2001
	Lauderhill	2002	
Dade	Hialeah	2004	
	Miami	1996	
	Miami Beach	2002	
Monroe	Key West	1999	
	Stock Island	2004	
St. Lucie	Fort Pierce ¹	1991	

¹Collected from boat only.

²Collected previously from ship in 1999.

at night from January to March). Dealates then proceeded to colonize the boat. At least one colony became established on board and subsequently grew until the infestation was detected and the boat fumigated in Ft. Lauderdale before returning to Providenciales.

It is likely that shipboard infestations will continue to contribute to the intrastate spread of *Coptotermes* in Florida, where the overwhelming number of infestations are within one kilometer of marine boat dockage. Eighteen *C. formosanus* and 3 *C. gestroi* samples in our collection database were taken aboard boats and ships. In inland locations, such as the Orlando and Tallahassee areas, land-based commodities such as railroad ties and landscape materials harboring incipient colonies may have served as vehicles of introduction.

We thank the many pest control professionals and others that have collected and submitted samples that were included herein, including Paul Ban, Bob Benham, Ron Box, Lyle Buss, Gabe Centeno, Jim Chase, Mary Cohen, Bruce and Jeff Edwards, Louis Giacone, Terry Harper, Jim Maler, John Mangold, Bruce Ryser, Jeff Stotts, and Mark Weinberg. William H. Kern Jr. and Brian J. Cabrera reviewed this contribution R-10474 of the University of Florida Agricultural Experiment Station Journal Series.

SUMMARY

Confirmed Florida localities of the Formosan subterranean termite, *Coptotermes formosanus*, and the Asian subterranean termite, *C. gestroi*, are reported. *Coptotermes formosanus* has been collected from 20 counties and 40 cities in Florida, while *C. gestroi* has been collected in 4 counties and 8 cities. Dispersal of both *Coptotermes* species have been facilitated by shipboard infestations and land-based commodities.

REFERENCES CITED

- ANONYMOUS. 1980. Formosan termites now in Florida. Pest Control Magazine, November: 20, 113.
- KIRTON, L. G., AND V. K. BROWN. 2003. The taxonomic status of pest species of *Coptotermes* in Southeast Asia: Resolving the paradox in the pest status of the termites, *Coptotermes gestroi*, *C. havilandi* and *C. travians* (Isoptera: Rhinotermitidae). Sociobiology 42: 43-63.
- KOEHLER, P. G. 1980. The Formosan subterranean termite. Florida Coop. Ext. Service, Univ. Florida Inst. Food Agric. Sci. circular ENT-51.
- SCHEFFRAHN, R. H., AND N.-Y. SU. 2000. Asian subterranean termite, *Coptotermes gestroi* (= *havilandi*) (Wasmann) (Insecta: Isoptera: Rhinotermitidae). 2000. Retrieved 13 October 2004 from University of Florida, Department of Entomology and Nematology "Featured Creature" Web site: <http://creatures.ifas.ufl.edu/urban/termites/havilandi.htm>
- SCHEFFRAHN, R., J. R. MANGOLD, AND N.-Y. SU. 1988. A survey of structure-infesting termites of peninsular Florida. Florida Entomol. 71: 615-630.
- SCHEFFRAHN, R. H., N.-Y. SU, AND B. DIEHL. 1990. Native, introduced, and structure-infesting termites of the Turks and Caicos Islands, B.W.I. Florida Entomol. 73: 622-627.
- SCHEFFRAHN, R. H., J. KRECEK, B. MAHARAJH, N.-Y. SU, J. A. CHASE, J. R. MANGOLD, A. L. SZALANSKI, J. W. AUSTIN, AND J. NIXON. 2004. Establishment of the African termite, *Coptotermes sjostedti* (Isoptera: Rhinotermitidae), on the Island of Guadeloupe, French West Indies. Ann. Entomol. Soc. America 97: 872-876.
- SU, N.-Y., R. H. SCHEFFRAHN, AND T. WEISSLING. 1997. A new introduction of a subterranean termite, *Coptotermes havilandi* Holmgren (Isoptera: Rhinotermitidae) in Miami, Florida. Florida Entomol. 80: 408-411.
- THOMPSON, C. R. 1985. Detection and distribution of Formosan termites (Isoptera: Rhinotermitidae) in southeastern Florida. J. Econ. Entomol. 78: 528-530.
- WOODSON, W. D., B. A. WILTZ, AND A. R. LAX. 2001. Current distribution of the Formosan subterranean termite (Isoptera: Rhinotermitidae) in the United States. Sociobiology 37: 661-671.