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Source: Florida Entomologist, 88(1) : 99-100

Published By: Florida Entomological Society

URL: https://doi.org/10.1653/0015-4040(2005)088[0099:NFDRFC]2.0.CO;2

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NEW FLIGHT DISTANCE RECORDED FOR *COPTOTERMES FORMOSANUS* (ISOPTERA: RHINOTERMITIDAE)

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The Formosan subterranean termite (FST), *Coptotermes formosanus* Shiraki (Isoptera: Rhinotermitidae), was first introduced to New Orleans after World War II inside infested cargo returning from the Orient (La Fage 1987). For the past 60 years, they have spread throughout the New Orleans metro area, displaced native subterranean termite species, and significantly damaged buildings, trees, boats, and railroad ties in the process. To help combat the problem, the U.S. Department of Agriculture-Agricultural Research Service (USDA-ARS) provided funding for treating buildings in a 50-block area of the French Quarter in New Orleans to determine if an area-wide subterranean termite control program is capable of reducing overall populations. Since 1998, populations have been reduced based on structural inspections, termite activity inside independent monitoring stations installed throughout the French Quarter, and the overall number of alates (winged reproductives) recovered from insect glue boards attached to streetlights throughout the French Quarter (Lax & Osbrink 2003). However, alates are still being captured in significant numbers inside selective areas of the French Quarter and along the borders of this treatment zone.

Each year during May and June, untold numbers of male and female alates disperse throughout the area in the early evening and tend to congregate around light sources when present. Information on how far they are capable of flying from a dispersal point was virtually unknown, especially in a large urban area. During field observations in early 2004, it appeared that FST alates were flying across the Mississippi River with the aid of prevailing winds and into the French Quarter. To establish if alates were dispersing into the treatment zone from bordering areas, alates were marked with fluorescent visible powders (Shannon Luminous Materials, Inc., Santa Ana, CA) during two dispersal flights on different evenings at a selected site of known termite activity across the Mississippi River, located directly to the southeast of the French Quarter. In cooperation with USDA-ARS, 445 rectangular (20.7 cm × 10.2 cm) glue boards (TRAPPER® LTD, Bell Laboratories, Inc., Madison, WI) were attached to streetlights along the Riverwalk and throughout the French Quarter to capture potentially marked alates. The glue boards were positioned on the streetlights just below the lantern. Weather conditions, including wind velocity and direction, were recorded each evening with a hand-held weather station (Kestrel® 4000, Nielsen-Kellerman, Boothwyn, PA). Alates were individually marked with a bright orange fluorescent powder with a hand-held commercial duster as they were flying in a north to northwest direction over the river. These alates were already in flight at the time of marking and their source could not be located. After marking, every glue board was removed and inspected with a UV black light. New glue boards were used for each dispersal flight event.

On 1 June 2004, approximately 50 FST alates were initially marked and a single alate was recovered across the River on a glue board 771 m away (Fig. 1). Then, on 7 June, approximately 50 alates were marked again and two alates were recovered on glue boards 866 m and 892 m away (Fig. 1). The wind direction on 1 and 7 June was from the south and southeast at an average speed of 0.93 m/sec and 0.83 m/sec, respectively. Previously, a wind speed at or below 1.0 m/sec was shown to be one of the most important microenvironmental factors involved in determining dispersal flight activity (Leong et al. 1983).

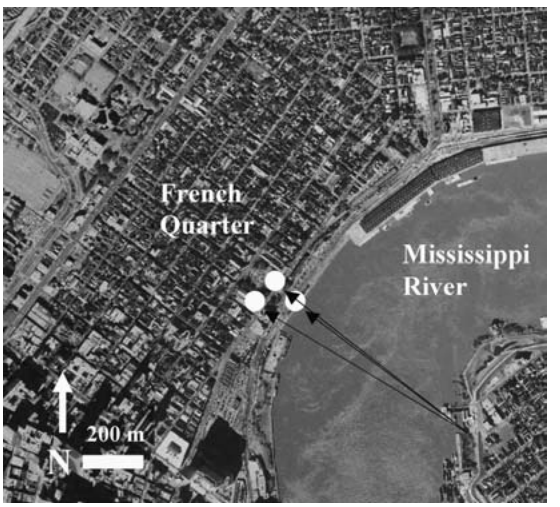


Fig. 1. Flight distances of three Formosan subterranean termite alates during dispersal flights across the Mississippi River in early June 2004 (Source of color-infrared photograph: National Aerial Photography Program, Jan. and Feb. 1998; courtesy of 3001-The Spatial Data Company).

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Historically, the only documented standard for maximum FST dispersal was a horizontal flight distance of 460 m at 2.2 m/sec (Ikehara 1966). These alates were visually observed in a large courtyard-type area located in Japan. Other studies have shown that the FST is capable of infesting high-rise buildings (>40 m high) with the aid of ocean current winds (Su et al. 1989). However, the accepted horizontal dispersal distance for the FST has always been approximately 100 m (Higa & Tamashiro 1983). Our results show that the FST is capable of flying almost twice the standard maximum (460 m) distance. At the same time, alates were able to fly across the Mississippi River with the aid of low wind speeds (<1 m/sec). These data have shown how re-colonization is possible in a treatment zone, such as the French Quarter in New Orleans, particularly during FST dispersal flight activity. In addition, these data represent an important factor to consider when evaluating an area-wide termite treatment project.

We are grateful to M. K. Carroll and C. Riegel, New Orleans Mosquito and Termite Control Board, for reviewing the manuscript. Special thanks to Dennis Ring and Pedro Levy (Louisiana State University Agricultural Center) for providing access to Operation Full Stop glue boards. We are also grateful to Nan-Yao Su, University of Florida, for reviewing the manuscript and translation of the Japanese reference. Partial funding for this project was provided by USDA-ARS under the grant agreement No. 58-6435-8-108.

Summary

Results from two separate mark-recapture trials revealed that Formosan subterranean termite, *Coptotermes formosanus* Shiraki (Isoptera: Rhinotermitidae), alates are capable of flying nearly one kilometer across the Mississippi River and into the historic French Quarter. This is the first documented mark-recapture study with alates on this scale, and our results represent a new *C. formosanus* flight distance record.

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