

Eliminating subterranean termite infestation in ships and yachts across Philippine ports.

by
Partho Dhang
2410 Belarmino Street, Makati City, Philippines

Abstract

In the past few years incident of subterranean termite damages to seafaring vessels including boats, yachts and ships of different class have come to light across the Philippines. Inspection, collection and identification revealed that these infestations are primarily caused by two species *Coptotermes gestroi* and *Microcerotermes losbañosensis*. A number of successful treatments of yachts and ships were conducted using Requiem termite bait and the results prove the bait to be effective in eliminating termite colonies in a single feeding.

Key words : Subterranean termite, ships, boats, vessels, termite baiting

Introduction

Human aided dispersal by shipping vessels is one of the primary means by which termites are transported across oceans into new continents. Most notable within the last century are, establishment of 6 exotic termite species in Florida (Scheffrahn, and Su, 2005) followed by 5 species in Hawaii (Yeap et al. 2007), and one in Australia (Peters 1990).

Termite infestations in maritime vessels, including boats and yachts is an overlooked area in SE Asia. There are no records of such reports available to evaluate the seriousness of this subject. In the past 5 years the number of requests for termite treatment received from owners of ships and yachts, highlights the fact that infestations are much too common. As wood is extensively used in vessels to construct the interiors, it was expected that exposure to infestation and damage is naturally possible over time.

Generally termite damage to wood used in ships is notably from drywood termite species such as *Cryptotermes brevis* which is established in the Philippines. However subterranean termites are not commonly reported to be pests in such situations. A majority of ship-borne infestations are presumed to have originated from infested wood used in construction, renovation or repair of the vessels structure and interior. At times infestation from flying swarmers while berthed at port or at dry dock is considered a possibility.

Inspections over the past few years have also revealed the use of a number of susceptible timber varieties in boats and ships in the Philippines. This could be one more reason for manifestation of infestations. Following are some of the timbers commonly used, which have recorded various degrees of termite damages.

	Scientific Name	Local Name
1	<i>Lagerstroemia speciosa</i> (L.) Pers.	Banaba
2	<i>Samanea saman</i> (Jacq.) Merr.	Raintree
3	<i>Anisoptera thurifera</i> (Blanco) Blume ssp. <i>Thurifera</i>	Palosapis
4	<i>Calophyllum inophyllum</i> L.	Bitaoag
5	<i>Canarium luzonicum</i> (Blume) A. Gray	Piling-liitan
6	<i>Hopea foxworthyi</i> Elm.	Dalingdingan
7	<i>Petersianthus quadrialatus</i> Merr.	Toog

This article describes treatment of a subterranean termite infestation on a yacht berthed at the Manila Yacht Club in Manila Bay.

Material and Methods

Inspection

The infested yacht was inspected on receipt of an inquiry from clients to identify the termite species. A treatment using the Labyrinth Baiting System with Requiem bait from Ensystem Inc was used. The Labyrinth Baiting system consists of a kit which includes 3 above-ground feeding stations and 1kg of Requiem termite bait.

Installation of baiting system

All infested sites were treated with the above-ground stations containing 140 gm of bait mixture. The bait mixture was prepared by mixing the bait with chlorine-free water in the ration of 1:3 to yield a consistency that does not drip water. As boats are expensive and contain delicate objects, care was taken not to install the stations in locations which would interfere with normal functioning of the ship.

Three (3) spots with active termites were chosen for installing the above-ground bait stations. Care was taken to make the bait less moist and a bit more dry because this happens to be the preferred way to make subterranean termites feed on the bait quicker. The stations were then locked and left for monitoring. All feeding stations were also marked with a “Do not disturb “ sticker.

The first inspection was conducted 4 weeks after the installation. Stations were refilled again with the bait without disturbance. Final inspection was conducted 3 weeks after the first inspection. The stations were then removed and the treatment area cleaned for restoration.

Results and Discussion

Detection of Subterranean Termite infestation

Inspection, collection and identification revealed that yacht was infested by subterranean termite species *Coptotermes gestroi*. The workers of the termite were found at multiple feeding spots on structural timber as well as decorative timber used in the interior. But no indication of the colony location could be ascertained due to the nature of the site, in particular due to lack of access to all areas.

Installation of baiting system

Three (3) above ground stations were installed on this yacht. The first inspection was conducted 4 weeks after the installation. The bait consumption was complete with a few live soldiers noticeable. Sightings of only soldiers in a bait station is considered a sign of negative affect on a subterranean termite colony.

Final inspection was conducted after 3 weeks. No noticeable bait consumption was noticed. This was confirmed as colony elimination. The stations were removed and the treatment area cleaned for restoration. The total amount of bait mixture consumed was estimated to be 450 gms and the time taken for elimination was 7 weeks.

However communication between and owners were kept open to know the status of the infestation. One year after this treatment the owner reported of no termite activity or termite damage on his property which confirmed a successful treatment of the termite colony.

Discussion

The nature of the infested site, a yacht berthed at sea, presented a limited scope for chemical treatment. Suggestion of fumigating the boat, followed by applying termite baits have been reported earlier (Mannes, 2012). The same report also quoted Dr. Scheffrahn and warned against fumigations, which are standard practice for drywood termites treatment as boats pose challenges and considerations that many pest controllers often overlook. For instance, rigging, cables and ropes make tenting the actual boat structure difficult. Most entrances on boats are sea-tight, but not airtight, which is another factor to consider in the fumigation process. Changes in tide could also affect how well a boat is sealed, and if a boat is not docked, pest controllers must be aware of drifting or other changes in location and the effects such changes may have on resource availability and insurance regulations. Also awareness of the expensive contents and well maintained nature of these boats should be considered, because any damage that occurs during fumigation could result in costly damages (Mannes, 2012).

In addition the intention of using chemical in a sea tight space was not thought safe. A strategy of a stand-alone bait method of to minimize insecticide was thought the safest alternative (Dhang, 2015). It was thus decided to carry out this treatment using termite baiting. Termite baiting has evolved in recent times as not only a sustainable method for managing termites but also as a quick action method in manmade structures of all kinds. Termite baiting involves the application of above ground baiting stations containing bait matrix on active termite feeding spots, mud tubes and mud galleries on the structure. This technique makes use of the inherent termite behaviors of interdependence, trophallaxis,

mutual grooming and cannibalism to distribute the bait toxicant throughout the colony, resulting in drastic population loss, colony suppression and at times colony elimination.

The choice thus was to use an efficacious bait with a large, one-time bait loading to avoid refilling stations and to reduce follow up visits. A number of bait toxicants and baiting systems have been developed and evaluated over the last few years for the control of subterranean termite species in SE Asia, but the most efficacious I have tested is the Requiem termite bait (Dhang, 2011; Lee et al, 2014). The product uses the toxicant chlorfluazuron (1gm of AI per kg of bait matrix) and is manufactured by Ensyslex Inc. (NC, USA) .

A number of successful treatments of yachts and ships were conducted over the past years and the result of using Requiem termite bait was proven to be suitable and effective. The bait completely eliminates the treated colony with a single feeding as in this case, the reason could be due smaller colony size in sites like vessels. A number of follow up inspections of dry dock and repair shops later had also revealed the presence of termites in stored wood stocks ready for use in vessels. Also boats staying for extended periods of time on land without proper protection had shown termite activity from subterranean colonies. It is however intriguing to note how these colonies continue to live inside boats while on water and how the colonies sustain without soil. Only a total dismantling of a boat can reveal information on this aspect.

References

Dhang , P (2011) A Preliminary Study on Elimination of Colonies of the Mound Building Termite *Macrotermes gilvus* (Hagen) Using a Chlorfluazuron Termite Bait in the Philippines. *Insects* 2011, 2(4), 486-490; doi:10.3390/insects2040486.

Dhang, P (2015) Role of baits in reducing the amount of insecticide in urban environment. *CAB Reviews*, 10, 003.

Lee, C C; Neoh, K B and Lee, CY (2014) Colony Size Affects the Efficacy of bait containing chlorfluazuron against the fungus-growing termite *macrotermes gilvus* (Blattodea: Termitidae). *J. Econ. Entomol.* 107(6).

Mannes, K (2012) Termite Control] Termites are where? <https://www.pctonline.com/article/pct0312-performing-termites-treatments> (accessed Oct 15, 2015).

Peters, B. C. 1990. Infestations of *Cryptotermes brevis* (Walker) (Isoptera: Kalotermitidae) in Queensland, Australia. 1. History, detection and identification. *Australian Forester* 53: 79–88.

Scheffrahn, R. H., and Su, N.-Y. 1995. A new subterranean termite introduced to Florida: *Heterotermes Froggatt* (Rhinotermitidae: Heterotermitinae) established in Miami. *Florida Entomol.* 78: 623–627.

Scheffrahn R H and Crowe W (2011) Ship-Borne Termite (Isoptera) Border Interceptions in Australia and Onboard Infestations in Florida, 1986–2009. *Florida Entomologist* 94(1):57.

Yeap, B.-K., Othman, A. S., Lee, V. S., and Lee, C.-Y. 2007. Genetic relationship between *Coptotermes gestroi* and *Coptotermes vastator* (Isoptera: Rhinotermitidae). *J. Econ. Entomol.* 100: 467–474.