Dry-Wood Termites And Their Control

By
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INTRODUCTION

Severe damage to structural timber, woodwork, furniture, and wood products of all kinds is often the result of unhindered dry-wood termite infestation. The damage may become so extensive as to render the affected buildings worthless and unfit for human habitation.

Dry-wood termites ("unos") are so-called because they inhabit and feed on dry wood. They can live in wood with as little as 2.5 to 3.0 percent moisture content (1) and can withstand excessive aridity (6). The ability of these termites to feed on dry wood is made possible by the presence, in their digestive organs, of microorganisms, mostly protozoa, that aid in digesting the wood (3).

Like the subterranean termites ("anay"), their near relative, these insects are soft-bodied, wingless for the most part of their lives, and social in habits. They live in colonies with their respective "queens", "kings", and "soldiers". The immature forms (nymphs) are the workers and food providers and are responsible for doing much damage to wood. In the course of time, these nymphs develop into winged reproductive adults.

In the forestry campus, College, Laguna, emergence and colonizing flights of the adults have been observed at night from April to September. Attracted to light in the beginning, they swarm around lighted lamps and bright lights. The flight is usually brief; they soon cast off their wings, pair off (male and female), and seek cracks and crevices in dry wood or bore directly into it. If the wood is suitable for their requirement, they begin a new colony. Only a small percentage of the colonizing adults succeed in starting new colonies; aside from the mortality which results from long exposure in the attempt to find suitable breeding places, many of them fall prey to house lizards, bats, ants, spiders, and other predators.

The successful pair, in time, produces young from eggs. The initial growth of the colony is slow, however, and the number of nymphs produced after two years may be from eight to fifteen only. Nevertheless, the queen (female termite), in the constant company of the king (male termite), increases in fecundity with each succeeding year, for about 10 years (2), so that the nymphs as well as their galleries in the wood continue to increase in number. Eventually, the whole length of the infested structure may become so damaged that only a thin shell remains. Before this happens, however, the entire colony or a portion of it may have already moved to some adjoining wooden structure.

Except when they are on their wings, dry-wood termites never show themselves out of their galleries and are therefore seldom seen. Their presence is nevertheless easy to detect. The accumulation of tiny fecal pellets (fig. 1) below or at the base of wood structures is the tell-tale of their depredations. Unlike their subterranean relatives, dry-wood termites do not need gallery connections to the ground.

PHILIPPINE DRY-WOOD TERMITES

Dry-wood termites belong to the family Kalotermitidae of which there are nine

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known species in the Philippines. Of this number, two are frequently encountered doing much damage to buildings. These are *Cryptotermes dudleyi* Banks[2] (fig. 2) and *C. cynocephalus* Light (fig. 3). These two species have soldiers with square, high, brownish-black heads. The former species, however, can be readily distinguished from the latter species by the relatively bigger size of the individual members of *C. dudleyi* species and by the low, broad, smooth head, and longer mandibles of its soldiers (fig. 4).

C. dudleyi occurs not only in the Philippines but also in Central and South America, Indo-Malaya, Papua, and Australia. In other countries, this species is frequently associated with some other dry-wood termite species (9). In the Philippines, a colony of *C. dudleyi* has been found in a wood chunk heavily infested by *C. cynocephalus*. *C. cynocepphalus,* considered native to the Philippines, is now also reported in Java (8). World commerce has been greatly responsible for the wide distribution of these destructive pests.

Other species of the family Kalotermitidae in the Philippines are: *Kalotermes mcgregori* Ligh, *K. taylori* Light, *Neotermes lagunaensis* (Oshima), *N. malatensis* (Oshima), *N. microphthalmus* (Light), *N. parviscutatus* (Light), and *Glyptotermes chapmani* (Light).

CONTROL MEASURES

A. Preventive control:

To prevent dry-wood termite infestation from taking place, the following steps should be considered:

1. *Inspection of second-hand lumber before using.*—Second-hand or old seasoned lumber intended for use should be checked carefully for evidences of infestation, such as excretal pellets and tiny plugged holes. Infested usable lumber should be kiln-dried or steam heated to at least 150 F. for 1-1/2 hours. Otherwise, such lumber should never be used in buildings. Discarded lumber from infested buildings should be burned.

2. *Screening of doors and windows.*—The use of wire screen, 20 meshes to the inch, on all doors, windows, and ventilation openings will prevent the entrance of winged termites into the buildings through these openings.

3. *Spraying swarms of colonizing adults.*—Very often, during the emergence season of winged termites, swarms occur around lighted lamps and other bright lights in the building. Finely atomized sprays containing pyrethrum will give a good knockdown. Sprays from aerosol bombs containing "Freon", 0.3% pyrethrins, and 3.0% DDT will also give a good kill and prevent the termites from forming new colonies. Spraying, however, cannot be counted upon to kill them all.

4. *The use of treated and naturally durable wood.*—Sapwood lumber is generally susceptible to the attack of dry-wood termites and should be avoided as much as possible in structures where permanent strength is desired and in places where the removal of the sapwood or remedial control treatment would entail much labor and expense.

Among the local timber species whose heartwood is very resistant to termite attack are: akle, dungon, guijo, ipil, manggachapui, molave, saplungan, and yakal. But their sapwood is not resistant.

Sapwood lumber can, however, be made resistant by proper preservative treatment. Snyder (7) is of the opinion that dipping lumber for 3 minutes in a 5.0% oil solution of pentachlorophenol or three-coat brush applications of the same solution to all surfaces will give considerable protection.

5. *Painting exterior woodwork.*—Painting the exterior of the building with several coats of heavy paint will be of help in protecting those surfaces from dry-wood termite attack if the termites have not already entered. Termites ordinarily do not

bore through paint to enter wood. All outside cracks and crevices should, if possible, be filled with putty or plastic wood. Paint on the outside, however, does not protect the inside surfaces.

B. Remedial control:

Where infestation has already taken place, but is not too extensive, it can be stopped by one of the methods that follow:

1. *Replacement of infested wood.*—If the infestation is severe but localized and the wood can readily be replaced, the infested pieces should be removed and burned immediately.

2. *Heating of infested pieces.*—Killing termites present in furniture can be effected by heating the articles for 1-1/2 hours at 150°F. in a dry kiln or other suitable heater (7). Infestation in limited areas in *flooring* and similar *woodwork* can also be stopped by a 10-*minute exposure to infrared heat radiation* (5). If the infestation is widespread, however, heating one or two spots cannot be expected to control the entire colony.

3. *Injection of insecticides into infested materials.*—Where other methods seem impractical to apply, injection of liquid insecticides or blowing insecticidal dusts into the termite galleries by means of a spray gun or dust bellows is recommended. Auger holes into the galleries, to permit injecting the insecticide, should be made not over 18 inches apart and then the holes sealed with putty or other suitable material after the treatment. It is believed that unless the holes are sealed the termites may block off the dusted galleries by means of a semi-carton of their own manufacture (4).

Among the effective oil solutions of insecticide used for the purpose of injection are: 6.0% DDT, 2.0% chlordane, 5.0% pentachlorophenol, 0.4% lindane, and trichlorobenzene. Where liquid insecticides are not desirable one ounce of the following insecticidal dusts, finely powdered, is sufficient to treat 15 to 30 holes: 50.0% DDT, sodium fluosilicate, paris green, sodium fluoride, and calcium arsenate (7).

These insecticides are poisonous to man and animals and should not be applied where they might contaminate food and drinking water nor stored in places within the reach of children and pets. They should be handled with care.

4. *Fumigation.*—Methyl bromide and hydrogen cyanide (HCN) fumigation of entire buildings is sometimes practiced in the United States and other countries for getting rid of dry-wood termite infestation. Two and one half pounds of methyl bromide or 2 pounds HCN is used to fumigate 1000 cubic feet of space (7). *These are deadly poisons.* Fumigation with them is very dangerous and should be undertaken only by experienced and licensed professional fumigators. The treated building must remain unoccupied until all the poison has dissipated.

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Dry-Wood Termites

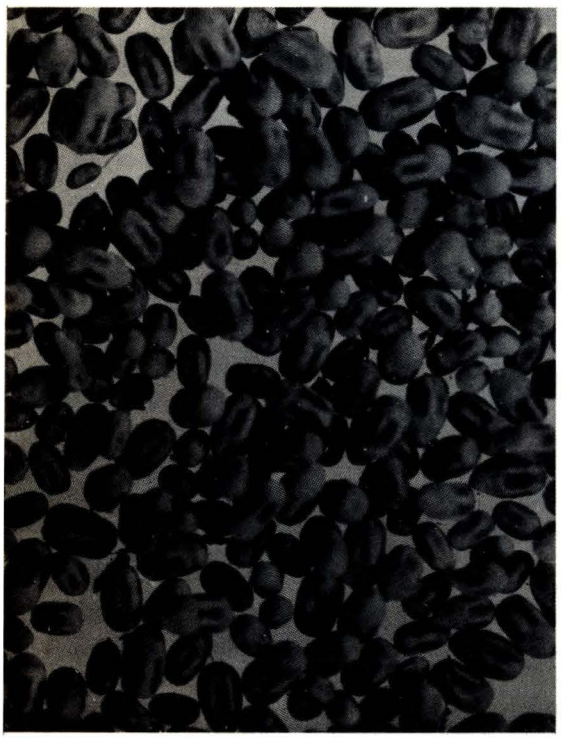

FIG. 1 Excretal pellets of dry-wood termites greatly enlarged.

FIG. 2 *Cryptotermes dudleyi* Banks, nymphs, greatly enlarged.

FIG. 3 *Cryptotermes cynocephalus* Light, nymphs, greatly enlarged.

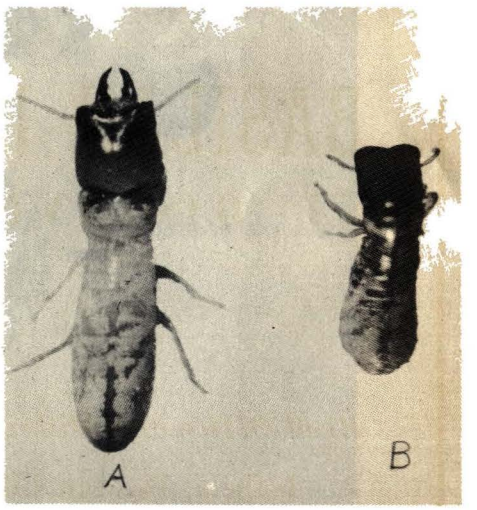

FIG. 4 Dry-wood soldiers (A) *C. dudleyi*, (B) *C. cynocephalus*, greatly enlarged.

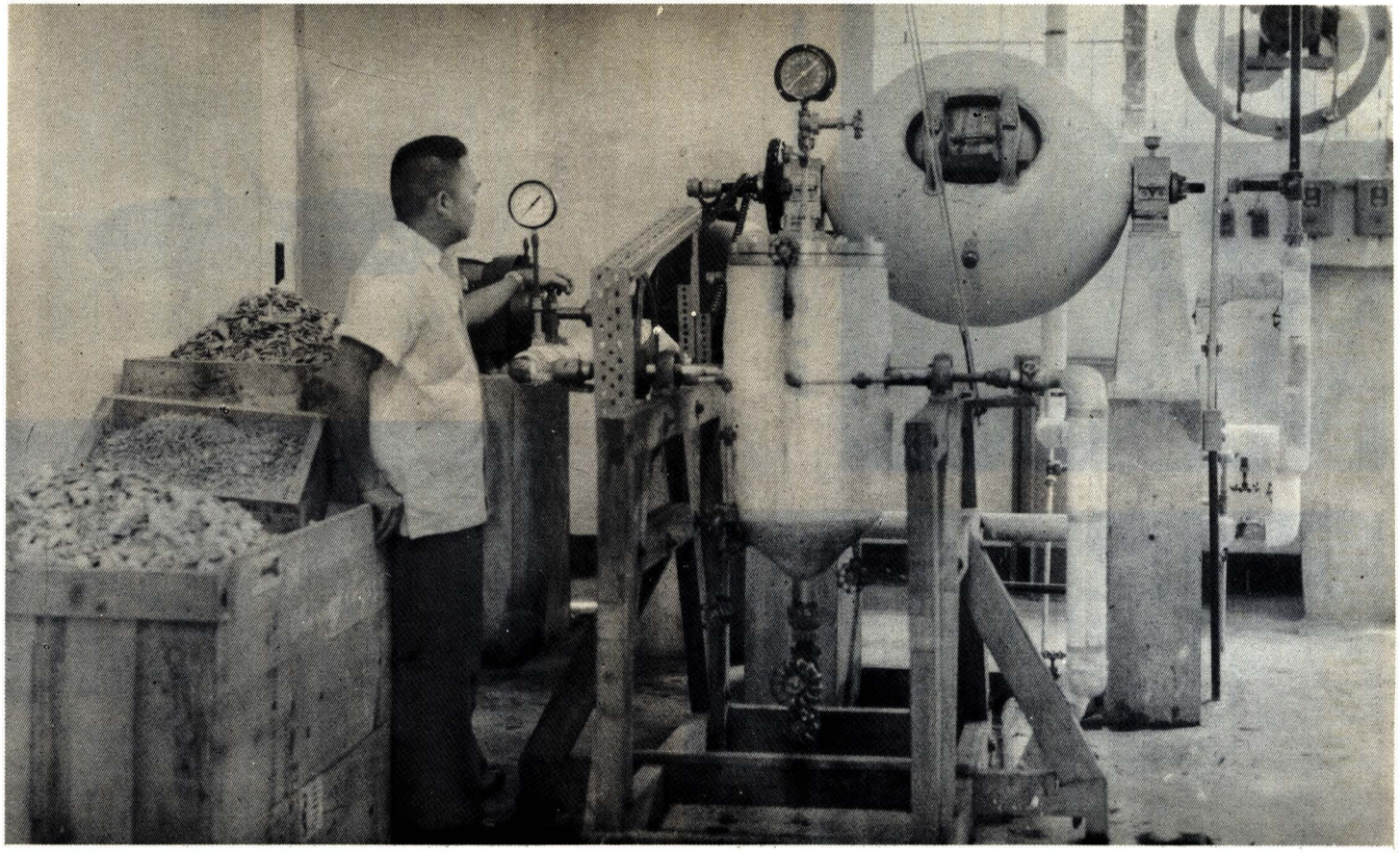

FIG. 1. Showing wood and bamboo chips, an operator, and the rotary digesters employed at the FPRI in pulping studies.