NATURAL RESISTANCE OF VARIOUS TIMBERS TO THE ATTACK OF *COPTOTERMES HEIMI* (WASM)

by

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Abstract. *Twelve common timbers of Pakistan have been tested for their resistance against the attack of* Coptotermes heimi *Wasm., a most destructive and common termite. Based on the longevity of workers and soldiers released on saw dusts of these timbers.* Cedrus deodara *and* Tectona grandis *proved most resistant while* Salmalia malabarica, Abies pindrow *and* Picea smithiana *were the most susceptible timbers.*

Introduction. Constructional and dimentioned timbers in use and in storage are destroyed by termites to a large extent the world over but the losses are much more in under developed countries due to non-adoption of preventive measures against termites. In wood deficient countries like Pakistan the situation is further aggravated by these losses. For bridging the gap between supply and demand of wood its protection from termite attack is an important factor. It can be achieved either by chemical treatment of wood or by using the naturally present quality in certain timbers to resist the attack of termites.

Grave yard tests had been the common method for teasting natural resistance in timbers but in these tests fungi and other micro-organisms also cause decay which makes the wood readily susceptible to termite attack. The results of grave yard tests are, therefore, the combined and cumulative effect of termites, fungi, soil organisms and weathering agencies. More over the results of such studies are available after several years. This experiment was therefore conducted to study how long *Coptotermes heimi* Wasm could live on the saw dust of 12 common timber species of Pakistan, thus providing a clue to the resistance of these species to termite attack.

Review of Literature. Methods of testing natural termite resistance of timbers in the laboratory under controlled conditions of temperature and humidity have been developed by many workers. Pence (1957) worked on prolonged maintenance of termites in the laboratory. Hardy (1961) described quick laboratory method of determining the termite resistance of materials. Bampton et al (1966) tested 30 Nigerian timbers for their resistance to subterranean termites in the field for one year and Butterworth et al (1966) conducted laboratory trials with some Nigerian timbers for their resistance to termites. Williams (1973) evaluated field and laboratory methods for testing termite resistance of timbers and building materials in Ghana. Abramushkina (1973) and Panfilova (1973) have reported on the termite resistance trials in U.S.S.R. Tylor (1973) worked out termite resistance of wood

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plastic composites by exposing them to laboratory colonies. Kakaliev and Saparliev (1976) tested treated and untreated materials for termite resistance by three methods. Placing of test meterials on the surface above ground part of the nest attracted termites after 2-3 days while those placed on the soil around the nest or in the soil around the nest attracted termites after 15-20 days.

Method and Material. *Coptotermes heimi* (Wasm) being one of the commonest termite species of Pakistan causing serious damage to timbers in use and storage was selected for this study. The following common timber species of Pakistan were used in laboratory test:

Botanical name	*Common name*	*Heart-wood or sapwood*
Tectona grandis	Teak	Heartwood
Cedrus deodara	Deodar	Heartwood
Acacia arabica	Babul	Heartwood
Dalbergia sissoo	Shisham	Heartwood
Morus alba	Mulberry	Heartwood
Picea smithiana	Spruce	No distinction
Pinus roxburghii	Chir	Heartwood
Tamarix aphylla	Frash	No distinction
Melia azedarach	Bakain	Heartwood
Pinus wallichiana	Kail	Heartwood
Salmalia malabarica	Semul	No distinction
Abies pindrow	Fir	No distinction

The saw dust of each timber was passed through a sieve of 25 mesh per square inch and then retained by a sieve of 40 mesh per square inch was used for the experiment. Rectangular glass jars of the size of 7.5×5 cm and 10 cm high were filled two-thirds with saw dust and approximately one-fourth quantity of water was added. There was one jar of each type of saw dust replicated thrice. All the jars were kept in a large trough at the bottom of which saturated solution of $K_2 SO_4$ was kept for maintaining relative humidity of 95% at room temperature of 27°C. Thirty workers and 10 soldiers of *Coptotermes heimi* (Wasm) were placed in saw-dust of each jar. Workers and soldiers were collected from the field in specimen tubes. A small strip of moist blotting paper was introduced in the tubes. The healthy individuals were readily attracted to moist blotting paper, from where counted number of termites as required were taken. 30 workers and 10 soldiers each were also released in jars with no food for comparison as control.

Results. Observations on the survival of termite workers and soldiers released on saw dust of various timbers were recorded which are tabulated below:

Longevity of *Coptotermes heimi* workers and soldiers on various saw dusts.

Timber species	Common name	Survival of termites (Days)
Cedrus deodara	Deodar	6
Tectona grandis	Teak	7
Melia azedarach	Bakain	15
Acacia arabica	Babul	19
Dalbergia sissoo	Shisham	23
Tamarix aphylla	Frash	25
Morus alba	Mulberry	32
Pinus wallichiana	Kail	38
Pinus roxburghii	Chir	38
Picea smithiana	Spruce	49
Abies pindrow	Fir	51
Salmalia malabarica	Semul	60
Check no food	—	4

Compared with longevity of workers and soldiers of *Coptotermes heimi* (Wasm) for 4 days without any food in check they lived for 6 and 7 days on *Cedrus deodara* and *Tectona grandis* saw dusts thereby showing maximum resistance of these timbers against the termite. *Picea smithiana, Abies pindrow* and *Salmalia malabarica* proved least resistant as the termite workers and soldiers survived for 49, 51 and 60 days, respectively on these saw dusts. Other timbers showed partial resistance to this termite.

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