

Destruction of Timber Panels by Wood Boring Organisms in Mandovi Estuary of Goa

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Received 14 March 1983; revised received 16 May 1983

Destruction on mango wood (*Mangifera indica* Linn.) panels in the Mandovi estuary of Goa at 5 different depths was studied for different seasons. The causative organisms were found to be *Lyrodus pedicellatus* Quatrefages and *Martesia striata* L. Maximum incidence of wood boring organisms was during Sept. and Oct. of the study period.

In Goa waters very little work has been done on the wood boring organisms which cause considerable damage to the fishing boats and trawlers. In order to augment the information known^{1,2} about this important group of organisms, their impact on mango wood panels in the Mandovi estuary of Goa has been studied and the results reported in this communication.

Untreated panels (10 × 15 × 2.5 cm) of mango wood (*Mangifera indica* Linn.) were suspended at 5 different depths (subsurface, 1.5, 3, 4.5 and 6 m) from July 1981 to May 1982. The panels were divided into 2 different groups for ascertaining monthly and seasonal variation in borer attack. In all, 55 monthly and 15 seasonal panels were exposed. Salinity data were collected³ to correlate the attack by these organisms.

The panels after exposure were scrapped of the fouling organisms and the number of entry holes on both the surfaces of each panel was counted. The panels were subsequently cut into 2 halves to assess the internal destruction caused, employing an arbitrary scale. In addition, the number of pallets of *Lyrodus pedicellatus* Quatrefages and specimens of *Martesia striata* L. found in the panels were collected to find out the relative abundance. Growth rate of these wood-borers was recorded by measuring the length of tunnels made by them. These were measured with the help of a flexible iron wire.

The period of observation comprised monsoon (July-Sept.), postmonsoon (Oct.-Jan.) and premonsoon seasons (Feb.-May). Salinity data are given in Fig.1. Data on monthly variations in number of entry holes and percentage destruction of wood are presented in Table 1. Fig.2 presents seasonal variations in estimated number of wood boring organisms accompanied by number of entry holes, whereas the seasonal variations in percentage of destruction of wood are shown in Fig.3.

The entry holes for the sub-surface panels were quite high during premonsoon months, the highest being in April (Table 1). However, at other depths the highest number of entry holes was during Oct. Similarly the percentage destruction was also quite high during Sept. and Oct.

During monsoon period the number of entry holes as well as the estimated number of wood boring organisms were quite high as compared to the other 2 seasons (Fig.2). Furthermore, during this season the attack appeared maximum at 4.5 m depth followed by 1.5 m depth and the least being at the sub-surface level. The attack on these panels was caused by *M. striata* and *L. pedicellatus* with a definite succession during different seasons. During the monsoon season the panels were predominantly attacked by *L. pedicellatus* whereas in other 2 seasons the dominant species were *M. striata*. In addition, there were stray occurrences of *Nausitora hadleyi* Schepman.

Percent timber destruction was nearly same at all depths during the premonsoon period (Fig.3). During postmonsoon season the percentage destruction was high at sub-surface, 1.5 and 4.5 m depths whereas at 3 and 6 m the destruction was comparatively less.

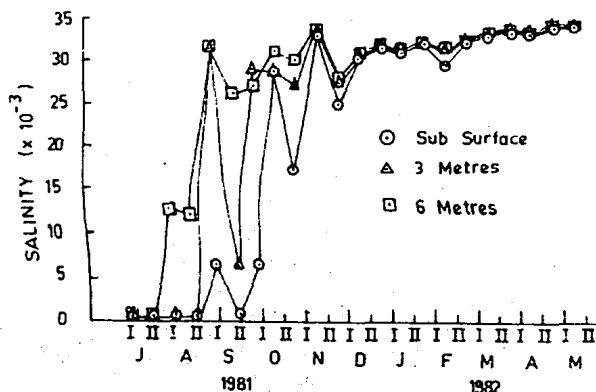


Fig. 1—Fortnightly variation in salinity during various months

Destruction during monsoon period was more or less the same at sub-surface level and at the depths of 1.5 and 6 m.

L. pedicellatus grew 1.1 to 2.3 cm during monsoon, up to 3.3 cm during postmonsoon and 4.5 cm in premonsoon season. The specimens of *M. striata* collected during the monsoon were of 0.5 to 0.8 cm in length. Their growth in post and premonsoon periods was 1.5 to 2.2 cm and 1.3 to 2.5 cm respectively.

As judged by the number of entry holes, the maximum incidence of wood boring organisms was

during Sept. and Oct. This indicates prevalence of their fully grown larvae in the estuary in large number, as well as an easy access to the panels for attack which could be due to less settlement of foulers. This period of high incidence follows the period of low salinity in Aug. It is therefore logical to interpret that the wood-boring organisms must have found low salinity as conducive for their breeding. The extremely low salinity during July and Aug. (Fig.1) is not favourable for the larvae of both *M. striata* and *L. pedicellatus*. But as the salinity showed slight increase in Sept. and

Table 1—Monthly Variations in Number of Entry Holes and Percent Destruction of Wood

	Depth									
	Sub-surface		1.5 m		3 m		4.5 m		6 m	
	A	B	A	B	A	B	A	B	A	B
	1981									
July	197	S	63	S	53	S	46	S	251	S
Aug.	178	S	616	S	673	S	880	S	526	S
Sept.	373	2%	477	2%	1283	5%	757	5%	812	5%
Oct.	279	2%	608	5%	1529	5%	1751	5%	1834	10%
Nov.	160	S	305	S	496	S	346	S	*	*
Dec.	205	S	316	S	244	S	*	*	251	S
	1982									
Jan.	426	S	446	S	457	S	366	S	245	S
Feb.	362	S	216	S	204	S	184	S	184	S
March	476	S	470	S	534	S	555	S	443	S
April	844	S	301	S	516	S	389	S	310	S
May	333	S	206	S	176	S	211	S	202	S

*Panel washed off

A = entry holes; B = destruction; S = destruction superficial only

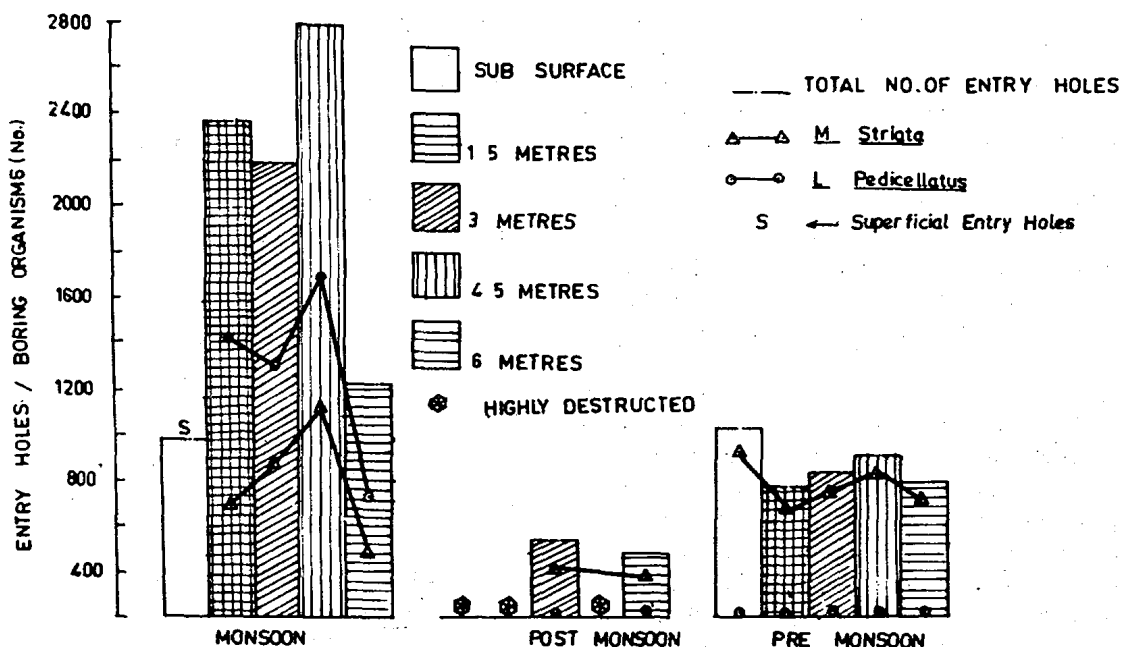


Fig. 2—Seasonal variations in number of entry holes and wood boring organisms

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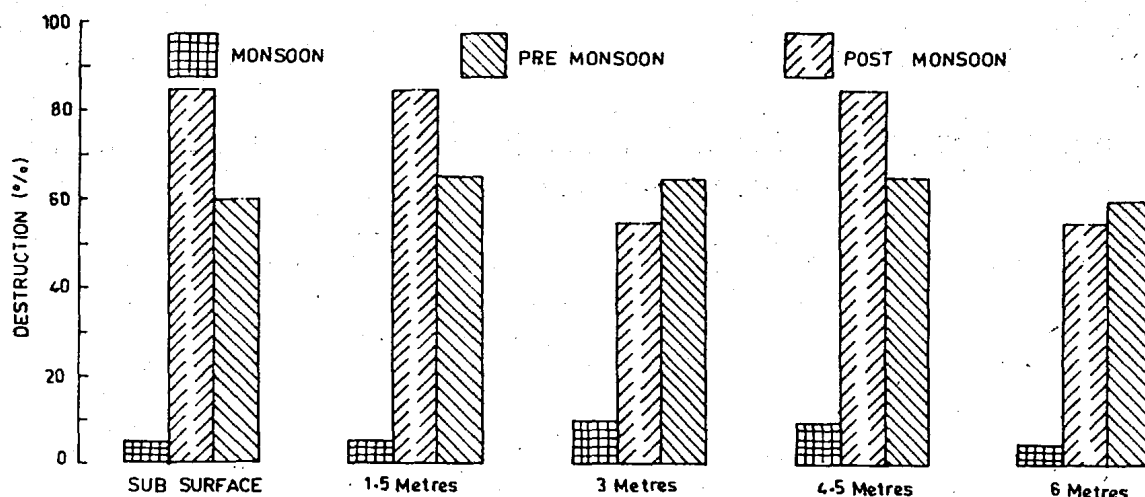


Fig. 3 --Seasonal variations in destruction of wood at different depths

Oct. the attack must have been augmented. Similar observation has been made by Santhakumaran and Ali Kunhi⁴ in Trombay waters. The low salinity values do not seem to be so conducive for their further growth as seen from Fig.3, where the percentage of destruction is minimum during the monsoon season. The minimal incidence of attack during the postmonsoon period (Fig.2) may be due to high settlement of fouling organisms such as *Balanus amphitrite* on the panels. These organisms must be preventing the entry of larvae of wood-borers thereby causing a biological control. This observation agrees well with that of Santhakumaran⁵ in Bombay Harbour. However, the destruction during monsoon can be described as the resultant effect of the attack caused during the late monsoon period.

The attack of timber was comparatively less at 6 m depths during all seasons. This may be due to silty bottom of the estuary^{9,10} and high values of turbidity as explained earlier by Devenish-Meares¹¹.

Abundance of *M. striata* over *L. pedicellatus* during premonsoon period and *L. pedicellatus* over *M. striata* during monsoon confirm earlier observations^{6,7}. The above observation also leads to the inference that *L.*

pedicellatus could thrive better than *M. striata* in less saline condition.

Based on these observations it can be said that in the Mandovi estuary, treatment of timber against the attack of wood boring organisms may be initiated during Sept. and Oct. by taking into consideration the attack as well as the destruction of wood.

The authors are grateful to Dr V V R Varadachari, Director for facilities and encouragement. Thanks are due to Mr S S Sawant for his help.

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