

On the Durability of some Cheap Timbers in the Construction of Underwater Structures Related to Fisheries

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The financial loss to the fishing industry of India on account of biodeterioration of underwater timber structures amounts to several million rupees every year. (Purushotham & Rao, 1971; Ravindran *et al.*, 1984 and Unnikrishnan Nair *et al.*, 1986). The availability of many species of timbers has become rather limited and the cost of timber has ever been increasing. For the construction of structures like sluices, stakes, fenders etc. cheap wood like mango, poon etc. are conventionally used. These are found to have very short service life. Enhancement of service life of timber structures can be achieved by selecting durable timber and by adopting wood preservation practices. Since physical and chemical means of wood preservation involve additional expenditure, selection of comparatively cheap and durable timber has a vital role in minimizing the financial loss to the fishing industry on account of biodeterioration of underwater timber structures. The present study on the natural durability of four species of cheap timbers common in Kerala is aimed at knowing their suitability as substitutes for conventionally used primary timbers.

The species of timbers used in this study were *Quassia indica* (Gaertn.) Nooteb (F.Simaroubaceae), *Strychnos nux-vomica* Linn. (F. Loganiaceae), *Azadirachta indica* A. Juss (F. Meliaceae) and *Holigarna arnottiana* Hook.f. (F.Anacardiaceae) locally known as *Karingotta*, *Kanjiram*, *Aryaveppu* and *Cheru*, respectively. Test panels of size

25x25x2.5cm of these timbers along with control panels of *Mangifera indica* (F.Anacardiaceae; local name: Mavu) were exposed in triplicate at subsurface level in the Cochin backwaters at Madavana, situated about 10 km south of Cochin Harbour. The test was carried out in two sets, one for 6 months and the other for 12 months, starting from March in the premonsoon season. Regular monthly observations on the incidence of fouling and boring organisms on the surface of the test panels were made and the panels were periodically scraped clean of foulers to facilitate thorough examination of the holes of borers and to allow fresh settlement of their larvae. Since there is not much correlation between the number of entry holes on the surface of test panels and the extent of internal damage as has been pointed out by Santhakumaran (1971), the two sets of panels were split open at the end of the tests for visual assessment of internal destruction. The condition of the test panels at the end of 6 months and 12 months of exposure is shown in Fig.1.

The results show that none of these four species of timbers is permanently resistant to the attack of wood-boring organisms. Test panels of *M. indica* (control), *A. indica* and *H.arnottiana* were completely destroyed within six months while those of *Q.indica* and *S.nux-vomica* showed some degree of resistance in the first six months. No internal damage was observed in the panels of *Q.indica* in the first six months while there was about 20 per cent internal

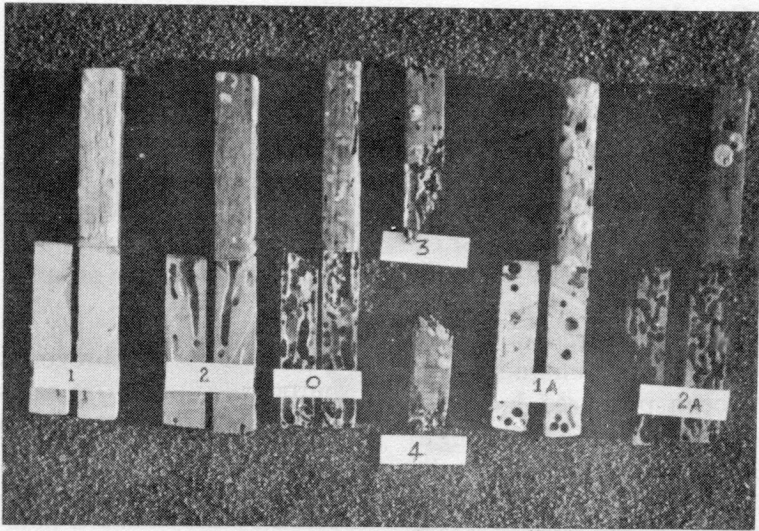


Fig.1. Photograph showing varying degrees of damage caused by wood-boring organisms in the timber test pieces. The lower halves of test pieces 1,2,0,1A and 2A have been split longitudinally to reveal the internal damage.

1.*Q.indica*, 2. *S.nux-vomica*, 3.*A.indica*,4.*H.arnottiana* and *O. M.indica* (control) after six months.

1.A and 2.A. *A.indica* and *S.nux-vomica* respectively, after one year.

destruction in the panels of *S.nux-vomica*. However, the test panels after one year showed about 20 per cent internal destruction in *Q.indica* and 100 percent in *S.nux-vomica*. It was also noticed that the panels of *Q.indica* was totally free of teredinid wood-borers and the destruction was due to the attack of the pholadid *Martesia striata*. In all the other panels, the destruction was due to the combined attack of teredinids and pholadids. *A.indica* and *H.arnottiana* possessed no natural resistance against marine wood-borers in spite of their high durability on land. These observations reveal that *Q.indica* has a high degree of natural resistance against marine wood-borers. Even though susceptible to the attack of pholadid wood-borers its resistance against shipworms is noteworthy. The present study indicates that *Q.indica* and *S.nux-vomica* are more durable than species like *M.indica* and hence can be used as good

substitutes for conventional cheap timbers under marine conditions.

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