

Studies on preservation of bamboo

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■ **Abstract** : Bamboo was treated by steeping method using boric acid borax, copper chrome boron and cashew nut shell liquid treatment for 14 day. After treatment, quality evaluation of bamboo was done by cutting bamboo in sample size of 61 cm (2') and exposing them to environmental condition. Mechanical properties of 61 cm (2') bamboo (30.5 cm (1') buried in soil and 30.5 cm (1') above soil were determined by using universal testing machine. Preservation of *Dedrocalamus ritchy* (manga) variety of bamboo can be done by using boric acid borax and copper chrome boron. Cashew nut shell liquid is not suitable for steeping method. Tensile stress and compressive stress treated with boric acid borax was maximum. Tensile stress of bamboo goes on increasing from bottom to middle height and decrease from middle to top.

■ **Key words** : Bamboo, Treatment, Mechanical properties

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Bamboos play a dominant role as woody raw material for a variety of products in the tropical regions. Bamboos are, however, more abundant in the tropics, with over 75 genera and 1250 species, ranging from small grasses to giants of over 40 m in height and 0.3 m in diameter. It has been reported that about 50 genera and 700 species of bamboo are found all over world. Asia alone accounts for 400 species. Over 136 species in 30 genera occur in India. In Maharashtra bamboo production is 2,47,239 tonnes. The Konkan region contributes 70,000 tonnes of bamboo production. In Konkan region *Dendrocalamus strictus* (Manvel), *Bambusa bambus* (kalak), *Dendrocalamus stocksii* (Mes) *Dendrocalamus ritchy* (Manga) are locally available varieties. Bamboo consists of 50-70s hemicellulose, 30 per cent pentosans, and 20-25 per cent lignin. Bamboo is known to be rich in silica (0.5 to 4%), but the entire silica is located in the epidermis layers, with hardly any silica in the rest of the wall. Bamboos also have minor amounts of resins, waxes and tannins. None of these, however, have enough toxicity to impart any natural durability. On the other hand, the presence of large amounts of starch makes bamboo highly susceptible to attack by staining fungi and powder-post beetles. A major drawback with bamboo is that it is not durable against wood degrading organisms. Thus, most bamboos used for structural purposes in rural and tribal housing deteriorate in a couple of years, putting heavy pressure on the resource, owing to increased demands for frequent replacements. This adversely

affects the supplies of bamboo, even in bamboo rich regions. Low life of bamboo and its susceptibility to various attacking agents is the main cause for its fewer acceptances as construction material but preservation can extend the life of bamboo and can maintain its quality and hence make it suitable for the use as construction material. Different preservation methods are used for this purpose.

The *Dedrocalamus ritchy* (Manga) variety of bamboo was used for the present study. The bamboo samples were collected from Ranevadi village of Dapoli Tahsil, district Ratnagiri. The bamboo of 4 year of age and more than 2 m in length was used.

Containers:

Plastic containers of 20 L capacity was used for keeping and mixing the preservative chemicals and for carrying out the various treatments. The six container were used for preservative treatment.

Weighing balance:

Weighing balance of 0.1 g to 2000 g capacity was used for the measuring the weights of the chemical preservatives.

Cutting machine:

Electrically operated cutting machine was used for cut bamboo in size of 61 cm (2') in length.