COLD BATH AND FUMIGATION EFFECTS ON THE ATTACK OF WOOD BIOLOGICAL-DESTROYING FACTORS AT TWO TESTING SITES

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INTRODUCTION. The availability of timber from community forests tends to increase year by year. These timbers have important role for many wood industries in Indonesia. Compared to that of the natural forest, unfortunately, such kind of timber is commonly inferior especially in its strength and durability. Therefore, their quality have to be improved before being used, for example is by wood preservation. Therefore, this research aims to study the influence of two treatments, namely the cold bath process of preservation using boron with several concentrations and the simple fumigation process using ammonia with several volumes, on the percentage of weight loss, the damage of wood surface and the attack intensity at the two testing sites.

MATERIALS AND METHOD. The main materials used were sengon (Paraserianthes falcataria), petai (Parkia speciosa), manii (Maesopsis eminii), karet (Hevea brasiliensis) and pinus (Pinus merkusii) woods. Other materials consisted of boron solution with 3 concentrations (5-, 10- and 15%) and ammonium hydroxide (technical) with 5 volumes (2-, 4-, 6-, 8- and 10 litres). The cold bath method for 2 hours was applied for wood preservation, while the exposure of ammonia gasses for 4 days was applied for wood fumigation. All treated wood were then buried. Grave yard test for 3 months following the ASTM D 1756 2008 was carried out for these two purposes. Data was statistically analyzed using a factorial experimental design by 3 factors randomly i.e. wood species, the concentration of boron or the volume of ammonia (depended on the treatment), as well as the testing sites (resettlement and experimental forest area), with three replications.

RESULT AND DISCUSSIONS. In case of boron treatment, it showed that the weight loss of karet treated-wood burried at the experimental forest area was the highest (53.98%), while in case of sengon treated-wood burried at the resettlement area was the lowest (7.03%). The damage of wood surface of karet treated-wood burried at the resettlement area was the highest (98.31%), while sengon treated-wood at the same site was the lowest (1.92%). Karet treated-wood burried at the resettlement area has the most severe damage (all wood samples destroyed; scoring = 0); while sengon treated-wood burried at the same site was not attack (wood sample relatively exist; scoring = 9.33). In case of ammonia treatment, it was shown that the weight loss of manii treated-wood burried at the resettlement area was the highest (70.57%), while the same species burried at the experimental forest area was the lowest (28.33%). The damage of wood surface of petai treated-wood burried at the resettlement area was the highest (98.15%), while sengon treated-wood at the same site was the lowest (47.10%). Manii treated-wood burried at the resettlement area as well as petai treated-wood at the experimental forest area have the most severe damage (all sample destroyed; scoring = 0), while sengon treated-wood burried at the experimental forest area was not attack (wood partly exist; scoring = 5.4). Either of boron concentration effect or ammonia volume effect on the tree parameters studied was varied. Generally, boron-treated wood was not resistant to wood biological-destroying factors exist in the experimental forest, but resistant enough to those of similar factors exist in the resettlement. As the contrary, ammonia-treated wood was resistant enough to wood biological-destroying factors exist in the experimental forest area, but was not resistant to those of similar factors exist in the resettlement.

Key words: Wood preservation, cold bath, fumigation, Paraserianthes falcataria, Parkia speciosa, Maesopsis eminii, Hevea brasiliensis, boron, amonia.