Testing procedures for selection of new pinewood preservation products

Belén Nevado[1], René Diaz[1], José Santos[2], Ofélia Anjos[1,3], Miguel Pestana[4], Helena Machado[4]

[1] Superior Agrarian School of Castelo Branco, Quinta da Senhora de Mércules, Apartado 119 – 6001 Castelo Branco – Portugal (ofelia@esa.ipcb.pt, belen_nevad@hotmail.com, dirtynere@hotmail.com)

[2] Laboratório Nacional de Energia e Geologia, I.P., Estrada do Paço do Lumiar, 22,1649-038 Lisboa – Portugal (jose.santos@ineti.pt)

[3]CERNAS – Centro de Estudos de Recursos Naturais, Ambiente e Sociedade, Bencanta, 3040-316, Coimbra – Portugal (ofelia@esa.ipcb.pt)

[4]INRB – National Institute of Biological Resources, Quinta do Marquês, 2780-159 Oeiras – Portugal (helena.machado@inrb.pt, miguel.pestana@inrb.pt)

ABSTRACT

In this work we compare the results of three experimental series of tests used as a first approach on selection of natural products for wood preservation.

Pine wood round poles 80 to 160 mm in diameter were subjected to vacuum, pressure and vacuum impregnation with pine oil, limonene and Tanalith®. Pinewood mini-blocks (20 x 20 x 6 mm) cut from the poles were exposed to the white-rot fungi *Trametes versicolor*. All test specimens were conditioned at room temperature and submitted to autoclave sterilization. Additional test specimens were sampled for moisture content determinations.

In first approach wood samples impregnated with the different products were deposed over a glass beads surface humidified with sterilised water in polypropylene vessels. Fungal plugs collected from actively growing colonies were deposed over wood samples and incubated for 4 weeks at 25ºC. Fungal development was assessed with an image analysis system using a digital camera and expressed by radial area.

In second experimental series wood samples were deposed over nutrient medium in 15 cm Petri dishes and inoculated with two fungal plugs in opposite sides of wood. The system was incubated at 25ºC during 6 weeks.

Third experimental series used a similar system but fungi were previously incubated during two weeks at 25ºC in Petri dishes. In each Petri dish, one impregnated sample and one control were placed over the fungal mycelium and incubated during six weeks. At the end of the test period all specimens were weighed, oven dried to constant mass and weighed again. Mass loss was determined.

Results of fungal growth areas were more contrasting than mass loss results but showed the same tendency with the evident protection of pine oil and Tanalith® impregnation treatments. Limonene impregnation treatments showed lower protection with weak reduction of the fungal growth and no effect on mass loss.

Keywords: Pine oil, limonene, fungal biodegradation, *Trametes versicolor*, wood preservation.