

Antifungal Activities of Selected Plant Extracts against Wood Rotting Fungi: A Challenge in Panel Wood Products**Shanbhag R.R. *, Murthy N., Mohanty B.N.***Indian Plywood Industries Research and Training Institute, Post bag No. 2273, Tumkur Road,
Bangalore, India***rashmishanbhags@gmail.com***Abstract**

Fungal infection to wood and panel product is a major economic concern for the building industry as it causes heavy losses of wood used in the construction. It is imperative to take the necessary steps to preserve the wood and the wood products. Due to growing concerns about the adverse effects of chemical preservatives on human health as well as environmental concerns had made the consumer look for alternatives. Hence an ideal compound for wood protection for interior applications which is non-toxic and able to provide long-term efficacy is increasingly being sought. As result, many plants are screened and their extractives were getting evaluated for their ability to inhibit fungal infection on wood. However, there is a lack of literature on the utilization of these bio based preservatives as the fungal inhibitor in wood composite panels. A study in this line is very important as challenges involved with of bio-based wood preservative for panel wood are totally different. Botanical preservative which is highly effective in wood may not be suitable for the panel wood products. Some modifications and incorporations are vital to use this bio-based preservative in the wood composite material. The objective of this paper is to investigate the fungal inhibitory effects of some natural plant extracts mixture, on wood panels and differences in their performances along with an obstacle faced in case of panel woods. For the purpose, extract of *Lantana camara* L., *Ricinus communis* L. *Catharanthus roseus* (L.) G. were prepared using water and petroleum ether as solvents by standard procedure. Amount of extractives obtained were quantified for each plant species. Extractives formed were range from 11-68-14.33 for different plant species. Extracts obtained from different plant were mixed to form a synergetic preservative and same was mixed in PF and UF resin at different concentrations (1%, 1.5%, 2%, 5% and 10%) and plywood samples were prepared using rubber wood veneers. Control panels were also prepared with PF and UF resins without extractives. From these panels experimental blocks were prepared and introduced in Kolle flask, containing test fungi *Polyporous meliae* and *Trametes versicolor* along with the control samples. Whole experimental setup was kept at room temperature ($25\pm 5^\circ$ C) with 60-70% relative humidity. After the completion of an experiment, samples were removed from the Kolle flask and myceliums adhering to test samples were cleaned by taking care not to remove the splinters of the samples. Blocks were dried in an oven and final weight was taken. Mean percentage weight loss was calculated, which varied from 8-25% for different test samples. Result revealed that, Minimal fungal inhibitory effect was seen even at 1% concentration and as concentration increased resistance also increased. But at higher concentrations of extractives in glue line negatively affected the important physical and mechanical properties of panels. Hence it is important to determine an optimal extractive concentration to achieve the best possible result as the bio based preservative that too without affecting the bonding strength of the plywood. Thus we can conclude that incorporating with slight modifications effective eco-friendly wood preservatives can be prepared by utilizing these plant extractives.

Keywords: Fungal wood decay, Bio-control, Plant extracts, PF and UF resins