
Title of project: Enhancing the durability of wood against wood destroying fungi using nano-zink

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Nanotechnology presents a tremendous opportunity to boost the field of wood preservation through implementing modern and unique metal biocides with improved properties. This study evaluated efficacy of spruce, beech, poplar and pine wood treated with 0.220 and 0.055% (m/m) zinc nanoparticles against *Poria placenta* a brown rot fungus a zinc tolerant organism. Results shown that nano-zinc inhibited decay fungi in the case of spruce, beech and poplar. Retention was proportionate with the preservative concentration and higher for softwoods compared to hardwoods. Although softwoods decay specimens demonstrated a better retention than hardwoods decay specimens, nano-zinc solution achieved a positive reduction in percentage mass loss for both groups of spruce and beech. In this study, nano-zinc concentration was quite low, related to previous studies where up to 5 % (m/m) nanoparticles concentrations were used for decay tests, demonstrating a satisfactory performance. Overall, zinc nanoparticles possessed favourable properties for wood protection against fungal decay from *Poria placenta*. Furthermore zinc nanoparticles showed good performance both for softwoods and hardwoods.

