

OPHIOSTOMATOID ASSOCIATES OF THE MOUNTAIN PINE BEETLE, *DENDROCTONUS PONDEROSAE*, AND THE NORTHERN SPRUCE ENGRAVER, *IPS PERTURBATUS*, IN WESTERN CANADA

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Native and alien insects carrying diverse fungi increasingly threaten the ecological and economic sustainability of Canada's forests. An example of immediate concern to western Canada is the 15 million hectare mountain pine beetle (MPB; *Dendroctonus ponderosae*)-fungal outbreak. Many other bark beetles infest logs and stressed trees across Canada on smaller scales. Because such beetles are usually associated with Ophiostomatoid fungi that stain wood and cause tree death, wood products from the infested trees have decreased value. Our ability to respond to such problems is constrained by our limited understanding of beetle-fungal-tree interactions and limited ability to identify and characterize pathogens. To address these problems, we assessed the fungi associated with *D. ponderosae* and *Ips perturbatus*, using morphological and molecular approaches. The MPB in British Columbia vectored nine species, including *Ophiostoma clavigerum*, *O. montium*, *Leptographium longiclavatum* and an *O. minutum*-like species. The dominant species differed on the beetle and sapwood. *Leptographium longiclavatum* was pathogenic although less virulent than *O. clavigerum*. While the overall *O. clavigerum* genetic diversity was low, we found two genetically distinct groups. For *I. perturbatus*, 13 morphological and phylogenetic Ophiostomatoid species were identified from beetles and galleries in spruce logs in British Columbia and the Yukon Territories. These included *L. fruticetum*, *L. abietinum*, *O. bicolor*, *O. manitobense*, *O. piceaperdum* and eight unnamed species of the anamorph genera *Leptographium*, *Hyalorhinocladiella*, *Ambrosiella* and *Graphium*. *L. fruticetum* was the species most commonly isolated. For both bark beetles, we found a more diverse microflora than previously reported. Certain species were consistently isolated from a beetle and its galleries, suggesting a specific relationship, while others seemed to be sporadic associates.