

COMPETITION BETWEEN FUNGI ASSOCIATED WITH *SIREX* WOODWASP AND SOUTHERN PINE BEETLE

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ABSTRACT

The mutualistic symbiotic fungus of the invasive woodwasp *Sirex noctilio* is *Amylostereum areolatum*, a wood rotting fungus. Wood rotted by *A. areolatum* is fed upon by developing woodwasp larvae. The fungus itself serves as the food source for *Deladenus siricidicola*, a nematode that also parasitizes *Sirex* larvae. The resulting sterilization of adult woodwasps serves as the basis for biological control programs worldwide. Biological control of *S. noctilio* is achieved via the use of trap logs, colonized by nematodes feeding upon *A. areolatum*. Any interference with these linked life cycles may disrupt the biological control system and corresponding reductions in *S. noctilio* populations.

We tested competitive interactions between *A. areolatum* and the southern pine beetle (SPB) fungal associates it may interact with if it becomes established in the U.S. South. *Amylostereum areolatum* (from South Africa), *Ophiostoma minus*, *Ceratocystiopsis ranaculosus*, and *Entomocorticium* sp. A (all from SPB in the U.S.) were pitted against one another on malt agar.

The area colonized by each competing fungus was measured as an indicator of its ability to colonize (and defend) substrate. The primary phoretic associate of SPB was able to competitively exclude the mutualistic fungus of the *Sirex* woodwasp and vice versa. The success of SPB or *Sirex* associated fungi will thus likely depend upon order of arrival. The likely influences on success of *Sirex* biocontrol efforts may then include the following:

1. Timing of inoculation/ placement of trap trees—*A. areolatum* will need to be well established before exposure to insects vectoring stain fungi.
2. Variability within strains of *A. areolatum* and parasitic nematodes—Substantial variation exists in competitiveness of *A. areolatum* strains and in their compatibility with biocontrol nematodes.
3. Abundance of, and pressure from, indigenous pine colonizing beetles and their associated fungi—Seasonal and dynamical factors may influence pressure from competitors for log substrates.