



Exotic Pest of Pines Threatens North American Pines

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Introduction

Sirex noctilio, the European woodwasp (Fig. 1), is a non-native woodwasp from



Figure 1: Adult *Sirex noctilio* female

Eurasia that was first detected in Oswego County, New York in 2005. Established populations now also occur in northern Pennsylvania, and the woodwasp has also been captured in monitoring traps in Vermont and Michigan. The wasp has a very destructive history in the southern hemisphere where high levels of mortality have been recorded in non-native monoculture pine plantations. *Sirex noctilio* is able to utilize most pine species in the U.S. including all of the commercially important yellow pines (loblolly, slash, shortleaf and longleaf) in the southern U.S. Although no large outbreaks have been recorded in the U.S. yet, history has shown

that it can take time for populations to build to a pest status (I.E. Gypsy Moth). *Sirex noctilio* is believed to have entered the U.S. in solid wood packing material such as pallets and crates. *Sirex noctilio* is not known to occur in Mississippi or any other Southeastern state, but numerous port cities and international airports create a risk for the wasp being introduced here. Also, after becoming established in one area of the U.S., it is very common for forest insect pests to spread to other areas through firewood movement and commercial movement of timber and timber products. Great uncertainty still exists about whether the woodwasp will be a major pest in the southeastern U.S. if it becomes established here. The woodwasp has been very destructive to loblolly pine plantations in the Southern Hemisphere. However, there are many more potential competitors and natural enemies in the southeastern U.S. that could limit the severity of *S. noctilio* if it should become established here.

Identification

Woodwasps (A.K.A. "horntails") are indeed wasps, but do not sting. Instead, woodwasp stings are modified for use as drills for laying eggs in wood. Adults are large, robust insects, typically 1.0 to 1.5 inches long. Females have a short ovipositor (egg laying appendage), a steel blue body, solid black antennae and red legs. Adult males are typically smaller and have dark hind legs and an orange/red abdomen. Woodwasps are relatively easy to distinguish from stinging wasps because they are "broad-waisted", or have a broad connection between their thorax and abdomen. Larvae are legless, creamy-colored, and have a unique dark spine at the apex of the abdomen (Fig. 2). It is fairly



Figure 2: *Sirex noctilio* larvae showing the apical spine

difficult to distinguish between native woodwasp, and the non-native European woodwasp. Native woodwasps are not

destructive pests, so if you see a woodwasp don't panic, it is probably relatively harmless.

Life History/ Biology

The female lays her eggs (25-450) into the trunks of stressed or dead trees, although in the southern hemisphere *S. noctilio* attacked healthier trees during high population levels. When *S. noctilio* injects her eggs into the tree, she also injects toxic mucus and the fungus *Amylostereum areolatum*. The fungus and the toxic mucus eventually kill the tree and help make it suitable larval habitat. Larvae will hatch from the egg 9 days after oviposition and feed on the fungus while boring through the heartwood of the tree. Larval development takes between 10 and 11 months, and then pupation (metamorphosis) occurs. Pupation lasts 16 to 21 days. Adults will emerge from the trees leaving a round exit hole. The complete life cycle of the wasp is typically one full year. Since the European woodwasp doesn't yet occur in the Southeast, we don't know when the wasps might emerge here if they make it to Mississippi, but experts expect emergence dates will occur between July and September.

Signs and Symptoms

Trees that have been attacked by *S. noctilio* usually have a distinct set of signs and symptoms that can help in diagnosing the problem. Needles usually begin to wilt and fade to yellow or red within 6 months of initial attack. When infested stems are split open, round (not oval) galleries excavated by the larval wasps are full of tightly packed sawdust. After pupation, adults exit the tree and form characteristic perfectly round emergence holes about 1/8 to 3/8 inch in diameter (Fig. 3).



Figure 3: *Sirex noctilio* exit hole

A symptom known as resin beading is a key identification character of living trees that have been attacked by *S. noctilio* (Fig. 4). Resin beading occurs as



Figure 4: Resin beading from a *Sirex noctilio* attack

pinus exude pitch from egg laying sites. Since native woodwasps usually attack stressed or dead trees that are basically incapable of exuding large amounts of pitch, this beading (along with properly sized round emergence holes) helps to distinguish trees attacked by *S. noctilio* from those attacked by native woodwasps or other woodborers.

Management/ Control

In the southern hemisphere, several biological control agents were introduced. Of these, the most important was a microscopic nematode, *Deladenus siricidicola*. The nematode infects the woodwasp larvae and sterilizes the adult females. Also, three insect control agents were introduced with varying degrees of success. In the U.S, we have representative species of all of the control agents and these may play a role in reducing the impact of *S. noctilio* invasion. One important way we can prepare for the potential arrival of the European woodwasp in Mississippi is to practice proper management of our pine stands. Proper site selection is critical because poor site conditions predispose pine stands to disease and poor overall health. Currently in New

York, stands with high basal area, small diameter trees are being favored for attack by *S. noctilio*. Proper thinning may reduce the impact of the European woodwasp and prevent high mortality should it become established in Mississippi in the future.

Perhaps most importantly, DON'T MOVE FIREWOOD. Our best defense is to delay the spread of this insect into Mississippi as long as possible.

For additional information contact:

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