

## DISCOVERY OF *SIREX NOCTILIO* (HYMENOPTERA: SIRICIDAE) IN ONTARIO, CANADA

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### ABSTRACT

A sirex woodwasp, commonly called “sirex woodwasp” or the “European woodwasp” *Sirex noctilio* (Fabricius) (Hymenoptera: Siricidae), is a high-risk alien invasive forest insect for North America. In September 2004, this insect was trapped in the field in New York, identified in February 2005 and confirmed as established in July 2005 – the first record of such for North America. The close proximity of the original and subsequent discoveries of *S. noctilio* in New York prompted a rapid response survey for this insect in adjacent areas in Ontario, Canada. This report records the first discoveries of this wood wasp in Canada in 2005.

A sirex woodwasp, *Sirex noctilio* (Fabricius) (Hymenoptera: Siricidae), which is commonly called “sirex woodwasp” (Haugen and Hoebeke 2005) or the “European woodwasp” (Ciesla 2003) is native to Europe, Asia, and parts of northern Africa. The woodwasp is not a pest in its native range, but it is a major pest of introduced pines in New Zealand, Australia, Uruguay, Argentina, Brazil, Chile, and South Africa (Ciesla 2003). This wasp typically is a problem in stagnant stands and is managed by the use of silviculture to promote stand vigor (Haugen et al. 1990) and by nematodes to reduce woodwasp populations (Bedding and Iede 2006). In pest risk assessments, *S. noctilio* is rated as a very high risk pest for North America (Haugen 2006).

On 7 September 2004, a single adult female was caught from a funnel trap located in a mixed hardwood-pine stand located in Fulton, Oswego County, New York as part of the USDA Cooperative Agricultural Pest Survey. It was identified on 23 February 2005 and confirmed on 5 July 2005 as established in the United States (Hoebeke et al. 2005, NAPPO 2005a, 2005b). Fulton is about 100 km south of Kingston, Ontario, Canada and about 80 km directly southeast of Prince Edward County, Ontario. As of mid November 2005, a delimiting survey had yielded 85 *S. noctilio* females in New York; 32 females within 8 km of Oswego, and six females between the 30 and 110 km (approximate) radius trap circles (APHIS 2005). The close proximity of Canada to the established population positive finds of *S. noctilio* in upper state New York and the multiple new discoveries during the summer of 2005 prompted a rapid response survey in Canada for this woodwasp. This report describes the results of that survey and reports on the discoveries of *S. noctilio* in Canada.

Thirty-six sites were sampled in Ontario along a line corridor from Sandbanks Provincial Park southeast of Wellington to Cornwall (Fig. 1). This narrow trapping corridor was chosen for its proximity to the known *S. noctilio* infestation in New York. Trapping sites contained either two or three needle, hard pines (*Pinus* spp.), and included small residential and roadside plantings, small plantations, and natural forests. Thirteen sites contained Scots pine (*Pinus sylvestris* Linnaeus), followed by 12 Austrian pine (*P. nigra* Arnold) sites, four red pine (*P. resinosa* Aiton) sites, four jack pine (*P. banksiana* Lambert) sites,

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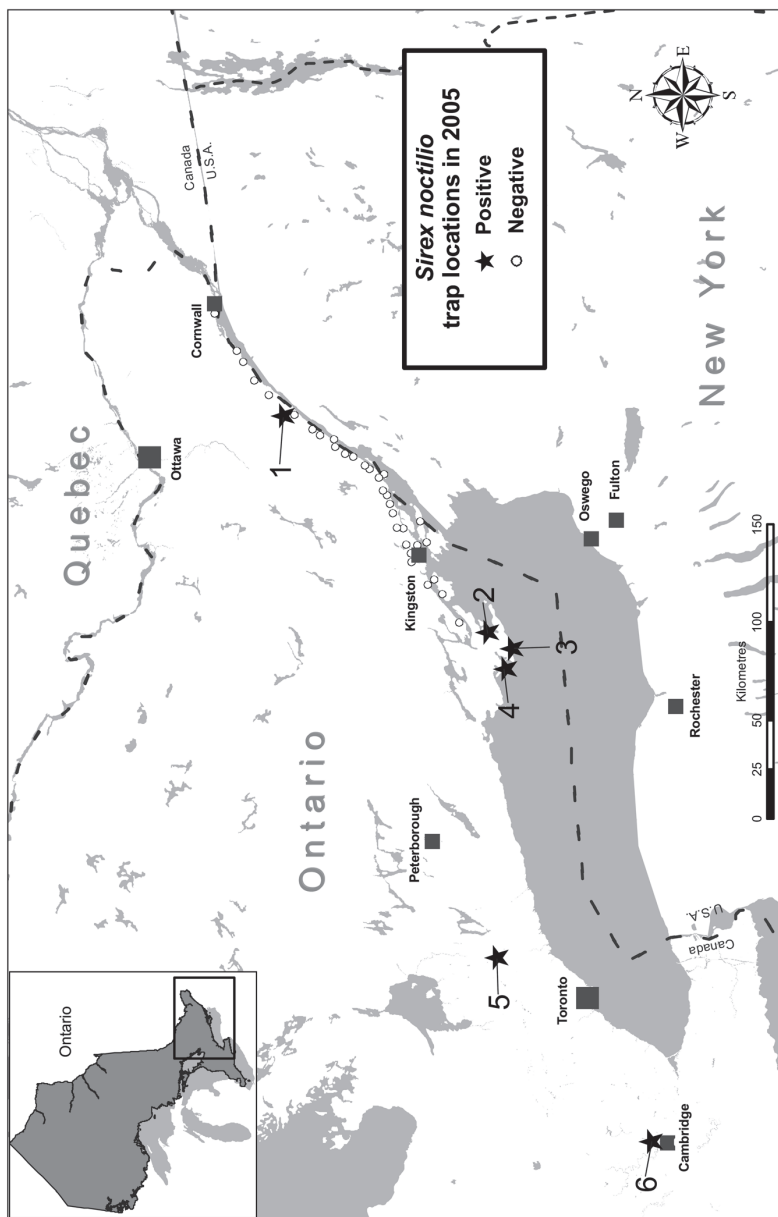
two pitch pine (*P. rigida* Miller) sites and one Mugo pine (*P. mugo* Turra) site. Tree height ranged from 4 to 20 m. Lindgren funnel traps (12-unit) (Pherotech, International, Inc., Delta, British Columbia, Canada) were used to capture woodwasps. Traps were hung from pine branches or between two pine trees at least 1 m away from the tree trunk and at least 0.5 m above ground. Each trap was baited with lures:  $\alpha$ -pinene,  $\beta$ -pinene, both in separate bottles, or a formulation of both in one release device (Table 1). These pinenes are common monoterpenes found in conifers and known to elicit an antennal response of *S. noctilio* (Simpson 1976, Simpson and McQuilkin 1976). The two different trapping configurations were set up, not as a research trial, but as an opportunity to gather some preliminary information about the attractiveness of different lures. At 17 sites, three traps were deployed 20 m apart, either in an equilateral triangle or a straight line depending on the forest stand, with one trap baited with  $\alpha$ -pinene, another with  $\beta$ -pinene, and the third trap baited with both lures. At the remaining 19 sites, two traps were deployed 20 m apart with one trap containing  $\alpha$ -pinene and  $\beta$ -pinene released from separate bottles, and the other trap containing a blend of  $\alpha$ - and  $\beta$ - pinenes released from one bottle. The purity, composition and release rates of the compounds used are described in Table 1. Traps were deployed between 23 August and 2 September 2005. All insects were collected from the traps during 19-23 September and again during 10-13 October 2005, when the traps were taken down. The flight period of *S. noctilio* was obviously unknown, but it was thought that it would be a late summer flyer similar to other native siricids and that surveys conducted in late August and September would not be too late to capture them.

Five adult *S. noctilio* females were collected from the 89 traps. Positive traps extended 195 km from Prescott, Ontario (Site 1) to near Wellington, Ontario (Site 4) (Fig. 1). All five females were captured in traps with  $\alpha$ -pinene lures (Table 1). At Site 4, Sandbanks Provincial Park (Fig. 1), two *S. noctilio* females were captured in traps deployed in a 20 m-tall Scots pine plantation situated on a sand dune and showing symptoms of stress. Single *S. noctilio* females were also captured in Scots pine plantations at Sites 1 and 3. Trees at

Table 1. Pine species at site and attractants used to capture *Sirex noctilio* and native *Sirex* species in traps in Ontario, August – October 2005.

Species	Pine species	Attractants <sup>1</sup>	Number captured
<i>S. noctilio</i>	Scots, red	1	5
<i>S. edwardsii</i>	Scots, pitch	2, 4	3
<i>S. juvencus</i>	Scots	1, 3	3
<i>S. nigricornus</i>	Scots, red, Austrian, pitch	1, 2, 3, 4	52

<sup>1</sup>Lure codes: 1 = two 17 ml low density polyethylene (LDPE) bottles of 99% pure  $\alpha$ -pinene (- 95/+ 5), released at 120 mg/day/bottle; 2 = two 17 ml LDPE bottles of > 98% pure (-) $\beta$ -pinene, released at 100 mg/day/bottle; 3 = one 17 ml LDPE bottle each of  $\alpha$ -pinene and  $\beta$ -pinene (as above); 4 = one 17 ml LDPE bottle with a blend of 70%  $\alpha$ -pinene (- 25/+ 75) and 30% (-) $\beta$ -pinene, released at 150 mg/day/bottle. Lures 1 to 3 produced by PheroTech Inc, Delta, British Columbia, Canada, and Lure 4 produced by Synergy Semiochemicals Corp, Burnaby, British Columbia, Canada.



**Figure 1.** Location of *Sirex noctilio* survey sites in southern Ontario in 2005. Sites 1-4 (star) and open circle sites were part of the rapid response survey, sites 5-6 were sites positive for *S. noctilio* as found through the Exotic Wood Borer and Bark Beetle Detection Survey conducted by the Canadian Food Inspection Agency.

Site 3 showed obvious signs of stress and trees at site 1 appeared quite healthy. Site 2 was an apparently healthy landscape planting of predominately red pine with fewer than 10 trees each of Austrian and Scots pine. In addition to *S. noctilio*, three adult female specimens of *S. edwardsii* Brullé, three *S. juvencus* (Linnaeus) and 52 *S. nigricornis* Fabricius, were collected from the traps (Table 1). Two voucher specimens of *S. noctilio* from this collection are deposited in the Great Lakes Forestry Centre Insect Collection, Canadian Forest Service, Sault Ste. Marie, Ontario. Two specimens are deposited in the Centre for Plant Quarantine Pests, Canadian Food Inspection Agency, Ottawa, Ontario, and one specimen is deposited in the Canadian National Insect Collection, Agriculture and Agri-Food Canada, Ottawa, Ontario.

After these collections were made, two additional locations for *S. noctilio* in southern Ontario (Sites 5 and 6, Fig. 1) were found through the Exotic Wood Borer and Bark Beetle Detection Survey conducted by the Canadian Food Inspection Agency (NAPPO 2006). The distance between site 1 (Cambridge) and site 6 (near Prescott) is about 435 km. The considerable distance between these finds in 2005 suggests that *S. noctilio* has probably been in Ontario for a while and is established. Detection and delimitation surveys in Ontario and Quebec in 2006 will help determine how widespread the infestation is and shed some light on its history and impact.

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