Detection of pine woodwasp in *Pinus taeda* in São Paulo State, Brazil

Carlos Frederico Wilcken¹ Amanda Rodrigues de Souza*¹
Barbara de Oliveira Puretz¹ Gabriella Ferreira de Camargo¹

¹Laboratório de Controle Biológico de Pragas Florestais, Faculdade de Ciências Agronômicas, Universidade Estadual Paulista “Júlio de Mesquita Filho” (UNESP), 18610-307, Botucatu, SP, Brasil. E-mail: agroamandarodrigues@yahoo.com.br. *Corresponding author.

**ABSTRACT:** The woodwasp *Sirex noctilio* (Fabricius) (Hymenoptera: Siricidae) is one of the main pests of *Pinus* plantations in South America. The aim of this study is to report the occurrence of *S. noctilio* in *Pinus taeda* in Botucatu, São Paulo, Brazil. The surveys were carried out in the arboretum of Faculdade de Ciências Agronômicas (FCA) da Universidade Estadual Paulista “Júlio de Mesquita Filho” (UNESP), campus Botucatu, SP where six species of *Pinus* are distributed in blocks of 100 trees. Resin beads were observed on the trunks and stems of *Pinus* species. In post-flight evaluation it was reported that 8.77% of *P. taeda* trees showed symptoms of oviposition by *S. noctilio*. A female *S. noctilio* was found performing oviposition. *Sirex noctilio* is present in Botucatu, increasing the geographical distribution of the pest in São Paulo State.

**Key words:** *Sirex noctilio*, exotic pest, forest pest, occurrence, pine.

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Detectação da vespa-da-madeira em *Pinus taeda* no estado de São Paulo, Brasil


**Palavras-chave:** *Sirex noctilio*, praga exótica, praga florestal, ocorrência, pinheiro.
the trunk (IEDE et al., 2015). In general, the pine woodwasp prefers dominated trees, as these trees are stressed and smaller, with a thinner trunk diameter (IEDE et al., 2015), between 7cm and 26cm at breast height (DBH) (NEUMANN et al., 1987), more than eight years old, and these are under stress (IEDE et al., 2015). The adoption of appropriate silvicultural practices to maintain the health and vigor of *Pinus* plantations is the main principle to prevent severe attacks (IEDE et al., 1998).

The main damage caused by *S. noctilio* is boring the wood caused by larvae; tree death occurs due to combined action of phytotoxic mucus and pathogenic fungus *Amylostereum areolatum* (Chailllet ex Fr) Boidin (Russulales: Amylostereaceae) growth (IEDE et al., 1998; NAHRUNG et al., 2016). The most visible external signs are canopy chlorosis, drought, and fall of pine needles, resin beads, and adult emergence holes. These factors affected the wood quality, limiting its use in the market (IEDE et al., 1998). The monitoring of areas infested by *S. noctilio* is performed by identification of trees with symptoms of external attack by adults, mainly resin beads along the trunk (PENTEADO, 2008). The main management strategy for the pine woodwasp is biological control using nematode *Deladenus (= Beddingia) siricidicola* Bedding, 1968 (Nematoda: Neothylenchidae), the egg parasitoid *Ibalia leucospoides* Hochenwarth, 1785 (Hymenoptera: Ibaliiidae), and the ectoparasitoids of mature larvae, *Megarhyssa nortoni* Cresson, 1864 and *Rhyssa persuasoria* Linnaeus, 1758 (Hymenoptera: Ichneumonidae) (HURLEY et al., 2007; CAMERON, 2012).

Signs of *S. noctilio* were reported in an experimental area of *Pinus* in Botucatu, state of São Paulo, Brazil during the periodic monitoring of leaf-cutting ants in this area (Figure 2). Thus, the aim of

Figure 1 - Occurrence of *Sirex noctilio* in Brazil.
this study was to report a new area of occurrence of *S. noctilio* in São Paulo.

A female of *S. noctilio* was found ovipositing in the trunk of a *P. taeda* tree (Figure 3), and resin beads were observed in the tree during a control operation of cutting ants in the arboretum of Faculdade de Ciências Agronômicas, Universidade Estadual Paulista “Júlio de Mesquita Filho” (FCA/UNESP) - Campus of Botucatu. This female was collected, fixed, and incorporated in the collection of the Entomological Museum of the Department of Plant Protection in FCA/UNESP.

Later, evaluations to find *S. noctilio* were carried out in other pine species of the arboretum. The *Pinus* species evaluated were: *P. caribaea caribaea*, *P. caribaea hondurensis*, *P. caribaea bahamensis*, *P. oocarpa*, and *P. elliottii*, planted between 1992 and 1999, in blocks of 100 trees (Table 1). *Pinus taeda* was the only species in the arboretum which was attacked by *S. noctilio*. Pre-infested trees were evaluated looking for symptoms of canopy chlorosis and dried pine needles, but no symptoms were observed, confirming no fungus colonization in trees.

Measurements of the diameter at breast height (DBH) were performed on all species of *Pinus* (Table 1). The average DBH of *P. taeda* was 20.9 cm (Table 1), confirming the preference of the pine woodwasp to oviposit in trees between 8 cm to 26 cm in diameter (NEUMANN, 1987). A total of 57 *Pinus* trees present in the arboretum, 8.77% (five trees) showed symptoms of *S. noctilio* oviposition. The other pine species in the arboretum have larger diameters compared to the *P. taeda* block (Table 1).

The dispersion of *S. noctilio* in Botucatu may have been through timber transport, due to the presence of the pest, *Pinus* spp., in the vicinity of the arboretum. The detection of one female *S. noctilio* in this municipality occurred in October. In Brazil, the occurrence of pine woodwasp adult pest vary from October to January (CARVALHO et al., 1993).

The detection of a *S. noctilio* female was recorded in Botucatu, SP, during the estimated period...
Figure 3 - Resin beads in *Pinus taeda* caused by *S. noctilio* in Botucatu, SP, Brazil, October, 2016.
Detection of pine woodwasp in Pinus taeda in São Paulo State, Brazil.

Table 1 - Diameter at breast height (DBH) of Pinus spp. in Botucatu, SP, Brazil (2016).

<table>
<thead>
<tr>
<th>Species</th>
<th>Number of trees</th>
<th>Rate DBH (cm)</th>
<th>Number of trees</th>
<th>Rate DBH (cm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>P. taeda</td>
<td>57</td>
<td>20.9</td>
<td>5</td>
<td>19.48</td>
</tr>
<tr>
<td>P. caribaea var. caribaea</td>
<td>32</td>
<td>26.1</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>P. caribaea var. hondurensis</td>
<td>52</td>
<td>29.6</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>P. caribaea var. bahamensis</td>
<td>15</td>
<td>35.7</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>P. elliottii</td>
<td>30</td>
<td>23.4</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>P. oocarpa</td>
<td>27</td>
<td>35.7</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

of occurrence of this pest in Brazil. Evolution of the typical symptoms of a S. noctilio attack, such as, drying and death of P. taeda trees in this municipality was not observed. The surveys carried out on pine species of the arboretum will continue in the following years, considering that the establishment of this pest was not confirmed in Botucatu yet.

In this context, population surveys on S. noctilio, in areas with Pinus plantations, in municipalities of the central region of São Paulo (Figure 2) has become necessary, to confirm the possible establishment of this pest and to guide management procedures based on biological control, using natural enemies. In this region there are Pinus plantations for wood and resin production, and the presence of the S. noctilio will cause economic losses for the farmers and forest companies.

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