

## INTRODUCTION

The Sirex woodwasp, *Sirex noctilio*, was first found in an established population in South Africa in 1994 at Tokai Plantation, near Cape Town. Native to Europe and North Africa, Sirex has also been introduced to Australia, New Zealand, Uruguay, Brazil, Chile and Argentina. In Australia, Sirex has caused up to 80% mortality in certain areas. Sirex is a relatively new introduction to South Africa, but it is spreading rapidly throughout the country and is already causing considerable mortality in certain areas.

## HOST RANGE

In South Africa, Sirex infests all the major commercial pine species. These include *Pinus patula*, *P. radiata*, *P. taeda*, *P. elliottii*, *P. pinaster*, *P. canariensis* and *P. pinea*. Currently, no pine species in South Africa shows high resistance to Sirex. Besides pines, Sirex has been recorded to infest other conifers, such as Douglas fir (*Pseudotsuga menziesii*), spruce (*Picea* sp.), fir (*Abies* sp.) and larch (*Larix* sp.) in other countries. Pine trees of 8 years and older have been infested in South Africa, but younger trees may be infested providing the diameter of the trunk allows the development of the larvae.



Sirex larva showing spike at the posterior end

## IDENTIFICATION

The adult wasps are metallic blue with two pairs of membranous wings. The female adult has a pointed projection at the rear of the abdomen that covers the ovipositor (egg tube). The male has a broad orange band covering most of its abdomen. The length of the adults ranges from about 10 to 40mm. Adults are most commonly detected on pine trees, when they are laying their eggs. The larvae are creamy white in colour and have a characteristic dark spike at the posterior end. This differentiates them from all other larvae found in pine trees. The larvae are found in the sapwood and can vary greatly in size, reaching up to 30mm in length.

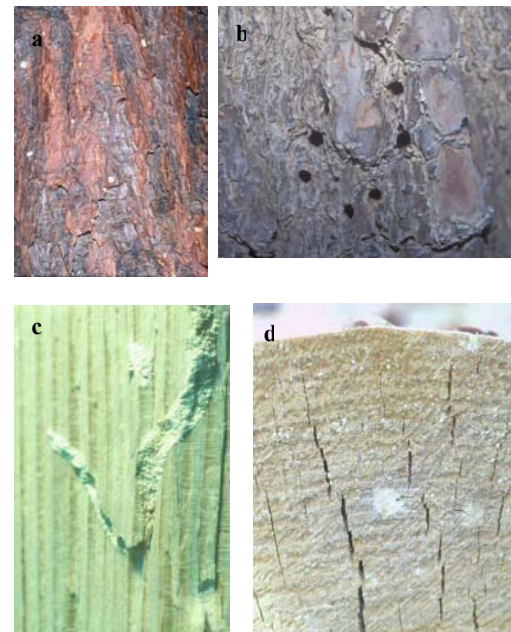


Dead pine tree after being attacked by Sirex

## SYMPTOMS

Besides the presence of the adults or larvae, the following symptoms may be observed:

- Wilted pine needles, first turning yellow and then brown
- Small resin droplets on the bark of infested stems (a)
- Circular emergence holes of adults which go through the bark and into the sapwood; from about 3 to 10mm in diameter (b)
- Larval tunnels in sapwood - circular in cross section and tightly packed with wood fragments (c & d)



## BIOLOGY

The female Sirex drills into the wood and inserts a toxic mucus and the fungus *Amylostereum areolatum*. The mucus prevents sugars from being passed down from the leaves, which would otherwise form fungal toxins at the site of infection. The fungus grows in the wood causing it to dry out and the trees die in a few weeks or months. Thus, it is a combination of the mucus and fungus that kills the tree.

If the tree is suitable for infestation, the female Sirex will also deposit eggs into the wood, and these soon develop into larvae. Larvae feed on the fungus, which has converted the wood cellulose into a more easily digestible form. The larvae tunnel into the trees, towards the heartwood, but then turn back towards the sapwood, forming a 'horse-shoe' or 'u-shaped' tunnel. Pupation occurs in the outer layers of the sapwood and the adult bores out of the trees giving rise to large round emergence holes.

## MANAGEMENT STRATEGIES

Fortunately, biological control agents have been identified and used with success for Sirex control in other countries. The primary biological control agent, the nematode *Deladenus (Beddingia) siricidicola* can achieve over 90% parasitism. This nematode, together with two other biological control agents, the parasitic wasps *Ibalia leucospoides* and *Megarhyssa nortoni*, were introduced into South Africa soon after the first detection of Sirex. None of these agents have become effectively established or have spread with Sirex. The Tree Protection Co-operative Programme at the University of Pretoria is currently in the process of reintroducing the biological control agents into South Africa in high numbers and on a continual basis.



Adult male emerging from pine tree

### PLEASE REPORT OCCURANCES OF THIS PEST TO:

Professor Michael J. Wingfield  
Mondi Professor of Forest Pathology  
The Director  
Tree Pathology Co-operative Programme  
Forestry and Agricultural Biotechnology Institute (FABI)  
University of Pretoria  
Pretoria 0002

Tel: 012-420 3938  
Fax: 012-420 3960  
Email: [Mike.Wingfield@fabi.up.ac.za](mailto:Mike.Wingfield@fabi.up.ac.za)  
www: <http://fabinet.up.ac.za>

Cover photo: **Female Sirex**

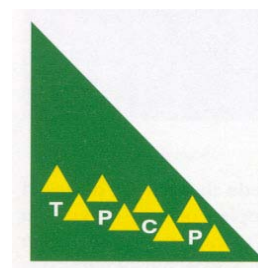
The Tree Protection Co-operative Programme represents a collaborative venture between the University of Pretoria and the major players in the South African Forestry Industry to reduce the impact of diseases and promote forest biotechnology. Members include: Mondi Ltd., Hans Merensky, Global Forest Products, Sappi Ltd. CTC, The Dept. of Water Affairs and Forestry and the ICFR.

Text prepared by B.P. Hurley ([brett.hurley@fabi.up.ac.za](mailto:brett.hurley@fabi.up.ac.za)) for TPCP: Diagnostic Services

Printed on White Diamond Gloss



## SIREX WOODWASP



**TREE  
PROTECTION  
CO-OPERATIVE  
PROGRAMME**