

## *Orthotomicus erosus*

**Other scientific names:** *Bostrichus duplicatus* Ferrari; *Bostrichus laricis* Perris; *Ips erosus* Wollaston; *Ips erosus* var. *robustus* Knotek; *Tomicus erosus* Wollaston; *Tomicus rectangulus* Eichoff

**Order and Family:** Coleoptera: Scolytidae

**Common names:** Mediterranean pine engraver beetle; European bark beetle; Mediterranean pine beetle

*Orthotomicus erosus* Wollaston, 1857 is a bark beetle that can kill pines particularly those planted at low elevations and on dry sites. It is usually considered a secondary pest infesting fallen and stressed trees and is often found in association with other forest pests. Its successful introduction into countries outside its native range has led to some concern, particularly in regions with significant areas of pine plantations.



BUGWOOD.ORGIL-M. NAGELESENZ102011

*Adult Mediterranean pine engraver beetle, Orthotomicus erosus*

### DISTRIBUTION

**Native:** Northern Africa (Morocco); Asia and the Pacific; Europe

**Introduced:** Africa: South Africa, Swaziland (early 1980s)

Asia and the Pacific: Fiji

Europe: Finland, Sweden, United Kingdom

Latin America and the Caribbean: Chile (1986 not now detected)

Near East: Tajikistan

North America: United States (2004)

### IDENTIFICATION

Adult beetles averages 2.7 to 3.8 mm length and are reddish-brown in colour (Cavey, Passoa and Kucera, 1994; Eglitis, 2000). The head is covered by a thoracic shield and is not visible when viewed dorsally. The posterior portion of the forewings is concave with four lateral spines; the second spine is the broadest and most conspicuous (Eglitis, 2000).

Larvae are white or cream-coloured, legless grubs with amber heads and are approximately 5 mm long when mature (Eglitis, 2000).

## HOSTS

*Orthotomicus erosus* primarily attacks pine species such as *Pinus armandii*, *P. brutia*, *P. brutia* var. *eldarica*, *P. brutia* var. *pityusa*, *P. canariensis*, *P. caribaea*, *P. coulteri*, *P. echinata*, *P. kesiya*, *P. massoniana*, *P. mugo* subsp. *uncinata*, *P. nigra*, *P. nigra* ssp. *pallasiana*, *P. patula*, *P. pinaster*, *P. pinea*, *P. radiata*, *P. strobus*, *P. sylvestris*, *P. tabulaeformis* and *P. yunnanensis*. It will attack other conifer species such as *Pseudotsuga menziesii* and *Picea*, *Abies* and *Cedrus* species but it is believed to breed only in pines.

## BIOLOGY

The Mediterranean pine engraver typically attacks recently fallen or cut pine trees and branches, but it can colonize and kill standing trees especially those stressed by drought, fire or wind (Haack, 2004). They generally breed in the rough-barked sections of the main trunk and in branches larger than 5 cm in diameter (Eglitis, 2000). Smooth-barked portions of host trees are primarily used for maturation feeding.

Attacks are initiated by males that bore through the bark to the phloem-cambium layer where they construct a nuptial chamber. They emit aggregation pheromones and are soon joined by one to three females, each of which mates with the male and then constructs an individual egg gallery from the nuptial chamber, parallel to the grain of the wood (Eglitis, 2000). Females typically lay 26 to 75 eggs in niches along the sides of the galleries (Eglitis, 2000; Lee, Smith and Seybold, 2005). The eggs hatch and the larvae feed in the phloem causing a distinctive engraving pattern; they develop through three instars expanding the tunnels as they feed (Lee, Smith and Seybold, 2005). When the larvae are ready to pupate, they tunnel towards the bark particularly if the phloem of the host tree is thick (Lee, Smith and Seybold, 2005).

Adult beetles maturation feed beneath the bark of the brood host or in another suitable host tree, sometimes of a different species (Eglitis, 2000; Haack, 2004). Between mid-October and December, they aggregate under the bark of host trees to overwinter. Small round exit holes measuring approximately 1.5 mm in diameter are apparent in the outer bark of host trees after adults emerge (Lee, Smith and Seybold, 2005). Adult beetle flight can occur through a broad temperature range of 14 to 38 °C; in Israel, the threshold for flight is even lower during winter (12 °C) (Eglitis, 2000).

The Mediterranean pine engraver completes two to seven generations per year in different parts of its range, depending on local temperatures and host quality (Haack, 2004). Two generations per year are typical in Turkey, France and Morocco, three to four generations are observed in Tunisia and South Africa, and three to five in Israel (Lee, Smith and Seybold, 2005).

## SYMPTOMS AND DAMAGE

The Mediterranean pine engraver is usually a secondary bark beetle that infests recently fallen trees, broken branches, slash, and standing trees that have been wounded or are stressed from a variety of factors such as fire or drought (Eglitis, 2000; Lee, Smith and Seybold, 2005). Attacks on stressed trees frequently leads to death of the tree.

The most conspicuous indication of attack by *Orthotomicus erosus* is the fading of foliage of infested host trees from green to yellow to reddish brown (Eglitis, 2000). Small entrance holes with frass pushed out and exit holes may be visible on the bark surface, especially on smoother bark surfaces; entrance and exit holes may be difficult to detect on rough-barked regions of the tree (Lee, Smith and Seybold, 2005). If vigorous trees are attacked, pitch tubes may be found in the bark crevices (Eglitis, 2000). Inspection of the underside of the bark of declining pines may reveal a dense network of galleries (Lee, Smith and Seybold, 2005). These galleries typically consist of a nuptial chamber and one to five longitudinal egg galleries but may vary depending on host type and location (Eglitis, 2000).



BUGWOOD.ORG/WWW.CIESLA/2500012

*Galleries created by the Mediterranean pine engraver beetle*

This beetle is often found in association with other forest pests including *Carphoborus minimus*, *Hylastes angustatus*, *Hylurgus ligniperda*, *Matsucoccus feytaudi*, *Pityogenes calcaratus*, *Pissodes nemorensis*, *Tomicus destruens* and *T. minor* (Eglitis, 2000). As with other conifer bark beetle species, *Orthotomicus erosus* is a vector for a number of wood-staining or blue-stain fungi which hastens the death of trees, discolours the wood and can result in loss of timber grade and value.

#### **DISPERSAL AND INTRODUCTION PATHWAYS**

Adult beetles are capable of flying considerable distances in search of suitable hosts and are also subject to wind dispersal (Eglitis, 2000). All life stages of the Mediterranean pine engraver can be easily transported on wood packing materials, particularly those made from pine and containing bark strips. Prior to the implementation of ISPM No. 15, this pest was commonly intercepted on wood packing materials such as crates and pallets since it often attacks recently cut trees which are typically converted into such materials (Haack, 2004).

#### **CONTROL MEASURES**

Preventative measures that involve good sanitation, limiting movement of recently cut pine branches and stems, keeping standing trees healthy and vigorous and early detection of infestations are the best defence against the Mediterranean pine engraver (Lee, Smith and Seybold, 2005). Proper care and watering of standing trees can reduce the probability of an outbreak since these beetles are known to primarily attack living trees under stress. It is recommended that managers avoid piling any pine material next to live trees and that they chip, burn or debark freshly cut pine material or for small quantities of pine material, completely cover them with thick, clear plastic sheeting in a sunny location (Lee, Smith and Seybold, 2005).



*Pinus brutia* killed by the Mediterranean pine engraver beetle, Cyprus

The Mediterranean pine engraver has several known natural enemies. The Syrian woodpecker (*Picoides syriacus*) has been observed feeding on the beetle in Israel (Lee, Smith and Seybold, 2005). In South Africa, the larvae are parasitized by wasps, such as *Dendrosoter caenopachoides* and *Metacolus unifasciatus*, and eaten by several predatory beetles including *Alulonium ruficorne*, *Corticeus pini* and *Platysoma oblongum* and the predatory bug *Lyctoris* sp. (Lee, Smith and Seybold, 2005). A parasitoid, *Dendrosoter caenopachoides*, was reared and released in South Africa and it has since established (Eglitis, 2000).