European and Mediterranean Plant Protection Organization
Organisation Européenne et Méditerranéenne pour la Protection des Plantes

Data sheets on pests recommended for regulation
Fiches informatives sur les organismes recommandés pour réglementation

Megaplatypus mutatus

Identity

Name: *Megaplatypus mutatus* (Chapuis)
Synonyms: *Platypus sulcatus* Chapuis, *Platypus plicatus* Brèthes, *Platypus mutatus* Chapuis
Taxonomic position: Insecta, Coleoptera, Curculionidae, Platypodinae
Common names: taladrillo grande de los forestales (Spanish), barreno de los forestales y frutales (Spanish)
EPPO code: PLTPMU
Phytosanitary categorization: EPPO A2 List no. 344.

Hosts

The main host of *Megaplatypus mutatus* for practical purposes is poplar (*Populus* spp.), whether in South America (where poplars are not native but the pest is), or in Italy (where poplars are native, but the pest is not). It is not clear what are the native hosts in South America, but *M. mutatus* has been recorded on a wide range of introduced timber, fruit and ornamental trees, including: *Acacia*, *Acer*, *Ailanthus*, *Citrus*, *Eucalyptus*, *Fraxinus*, *Laurus*, *Ligustrum*, *Liquidambar*, *Magnolia*, *Malus*, *Melia*, *Platanus*, *Populus*, *Prunus*, *Pyrus*, *Quercus*, *Robinia*, *Salix*, *Tilia*, *Ulmus* (Etiennot *et al*., 1998; Giménez & Etiennot, 2003); even conifers (*Pinus*, *Taxodium*) are attacked. In Italy, *M. mutatus* has also been recorded on *Corylus*, *Castanea* and *Juglans*.

Geographical distribution[1]

EPPO region: Italy (Campania; Tremblay *et al*., 2000)
South America: Argentina, Bolivia, Brazil, Guyane, Paraguay, Peru, Uruguay, Venezuela (Schedl, 1972)
EU: Italy.

Biology

M. mutatus is univoltine in South America as well as in Italy. It overwinters mainly as mature larvae or immature adults (Alfaro, 2003). Adults (Fig. 1) appear in the field in late spring-early summer (November–December in South America and May–June in Italy). Males start emerging a few days before females, and fly to tree trunks over 15 cm in diameter, in which they bore a radial gallery directed towards the centre of the trunk, and attract females by releasing a specific pheromone (González Audino *et al*., 2005). After mating, the two adults bore new galleries inside the trunk, in which the female lays 100–200 eggs over a period of 2–3 months. During laying adults also inoculate the galleries with a symbiotic fungus specifically associated with the pest: in Argentina, this was identified, in the galleries and frass, as the ascomycete fungus *Raffaelea santoroi* (Guerrero, 1966). The fungus is not harmful to the tree, and simply grows saprophyticlly on the walls of the galleries, which become blackish as a result. The first and second instar larvae of *M. mutatus* are mycetophagous, feeding on the mycelium; as they grow larger, they become xylophagous, feeding on the wood directly. The larvae generally reach maturity in the 5 months before the cold season or in early spring. They pupate in spring, and the adults emerge in late spring or early summer. Occasionally a few adults emerge before winter but, if a second generation is started, it is interrupted by cold (Santoro, 1963). There is no evidence, as yet, that *M. mutatus* has any distinct geographical races or ecotypes in South America.

Fig. 1. Male adult of *Megaplatypus mutatus* (Chapuis, 1865). (picture by G. Allegro, CRA, Istituto di Sperimentazione per la Pioppicoltura, Casale Monferrato, IT)

Detection and identification

Symptoms

M. mutatus preferentially attacks large tree trunks (over 15 cm in diameter). The main sign of infestation is the presence of

[1]An updated geographical distribution can be viewed on the EPPO website.

Fig. 2 Entrance holes of *Megaplatypus mutatus* (Chapuis, 1865) males into the trunk. (picture by G. Allegro, CRA, Istituto di Sperimentazione per la Pioppicoltura, Casale Monferrato, IT)

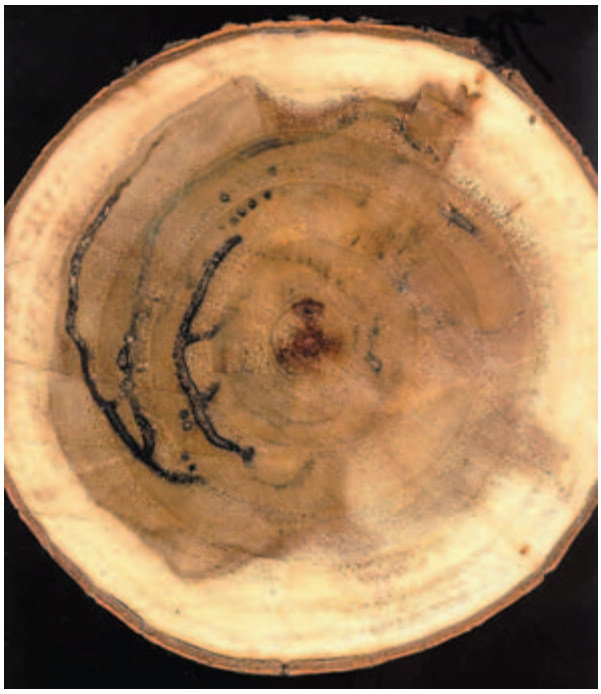

Fig. 3 Galleries of *Megaplatypus mutatus* (Chapuis, 1865) inside a poplar trunk. (picture by G. Allegro, CRA, Istituto di Sperimentazione per la Pioppicoltura, Casale Monferrato, IT)

holes 3 mm wide, exuding sap and frass (Fig. 2) in early summer. The internal sinuous galleries are lined with the black mycelium of the symbiotic fungus (Fig. 3).

Morphology

Eggs

Eggs are whitish and translucent, elliptical, about 1 mm long and 0.6 mm wide (Toscani, 1990).

Larva

The larval shape changes from elliptical (1st instar) to cylindrical (5th instar). The mature larva is about 7.2 mm long. The colour is brilliant white at 1st instar, becoming yellowish towards maturity (Santoro, 1965a).

Pupa

The pupa is 8–9 mm long, whitish in colour (Santoro, 1965a).

Adult

The adult has a cylindrical body with sulcate elytral striae. The head is as long as the pronotum. The male is about 7.5 mm long, dark brown above, clearer below; the female is 8–9 mm long, brown above and reddish-yellow below. Tarsi and antennae are reddish. In the male, the elytrae have truncate tips, with characteristic spiniform processes on the declivity; in the female, they have round tips, without processes. In both sexes, the anterior tibiae are rasp-like, helping the insect to move inside the galleries.

Pathways for movement

Locally, *M. mutatus* is dispersed by adults whom fly to new trees, generally within a range of 50–100 m from the emergence hole. The adult is not a very good flyer, and is not likely to spread more than 100 m. After emergence, the adult has to find a new host within a maximum of 5 days (Santoro, 1963). Long-distance transport of the pest is possible in particular by commercial trade of wood (particularly large trunks), or by wood packaging accompanying other traded articles. *M. mutatus* was first found in Italy in 2000 (Allegro & Della Beffa, 2001), and was probably introduced with a single trial consignment of roundwood of poplar with bark, imported in that year from Argentina. The pest is particularly likely to be carried by recently felled wood. Debarking of trunks does not eliminate the possibility that the pest should be carried. *M. mutatus* could also be carried by plants for planting of its host trees, provided they were large enough to be attacked.

Pest significance

Economic impact

M. mutatus is most important as a pest of timber trees (especially poplar). It is a primary pest, as it attacks only live standing trees (Allegro, 1990). It does not attack declining trees or cut wood, and will only be present in them as a result of earlier primary

attack. It drills the trunks and bores internal tunnels that weaken the trees, reducing yield (in wood volume) and causing breakage by wind, and even killing trees which are highly stressed. The adult and larval galleries, by their presence and their dark fungal discoloration, disqualify the wood from the standards required by the plywood industry, thus dramatically lowering its value.

Fruit trees are also attacked by *M. mutatus*. They are weakened by the galleries, produce less fruit, and become liable to breakage by wind (Carella & Spigno, 2002). No significant environmental impacts have been documented, except some damage to trees planted as windbreaks.

There is no detailed information available on losses in South America, but it is reported that some poplar producers have lost their high quality wood market and have been obliged to diversify their activity to maintain their income, or else have lost income because of trading a lower quality product. There is similarly no detailed information on losses in Italy, but it is anticipated that growers will suffer from the decline in quality of their product, in view of the high quality standards required by the wood industry.

Control

M. mutatus is difficult to control, since most of its life cycle takes place within wood, and the adults, who are accessible to treatment during flight, are not very sensitive to insecticides. In Argentina, two approaches are used. The first is early detection and destruction of infested trees (Santoro, 1967; Toscani, 1990), while the second is chemical control by injecting insecticides into the galleries or spraying trunks (Santoro, 1962, 1965b, 1967) during peak adult emergence in spring (Santoro, 1963). Carbaryl, cypermethrin (Bascialli *et al*., 1996), chlorpyrifos and lambdacyalothrin (Giménez *et al*., 1995; Giménez & Etiennot, 2002) have proved to be highly effective. However, such chemical treatments are costly and potentially harmful to the environment, and can only be carried out in high-value agricultural crops and in restricted areas. They are not advisable in woodlands.

Recently, the sex pheromones of the male of *M. mutatus* have been identified (González Audino *et al*., 2005) and are now being tested in the field with different kind of traps in order to assess their effectiveness in attracting females. Their use in mass trapping strategies or, at least, in monitoring population peaks could be a valuable help in the control of the pest. Preliminary field tests with non-specific attractants gave unsatisfactory results (Alfaro *et al*., 2004). Though biological control would be a desirable strategy, no natural enemies of eggs or larvae of *M. mutatus* are known at present.

Phytosanitary risk

The fact that *M. mutatus* has already become established in Italy (Campania), and is already causing damage to poplar (reduction of wood quality) and to fruit and nut crops (*Malus*, *Corylus*), shows that this pest presents a definite phytosanitary risk for the EPPO region. Indeed, tree mortality has been noted in *Corylus*. It may be noted further that *M. mutatus* has been introduced without its natural enemies, and may thus have a greater economic impact than in its area of origin.

However, up till now, spread in Italy has been limited, which suggests a slow rate of natural dispersal. In 2006, the pest was still restricted to the province of Caserta in Campania, to which it was introduced in 2000 (Italian NPPO region Campania Survey results 2005–2006). Thus, although there is little possibility of eradication, there should a possibility of containment. The main possibility for spread by humans would be with poplar wood.

The endangered area extends widely in the EPPO region, because of the presence of numerous host plants for this polyphagous pest, and because climatic conditions are suitable over many parts of the region. A CLIMEX study, though having a high degree of uncertainty, indicated that the Mediterranean coasts are most likely to be at risk, extending to Portugal. Considering that the species may have a lower degree day per generation requirement than expected, the endangered area could possibly be extended to Northern Italy (Po valley, where there is extensive production of poplar), coastal areas of Balkan and Black Sea countries (EPPO, 2007).

Phytosanitary measures

M. mutatus was added in 2007 to the EPPO A2 action list and endangered EPPO member countries are thus recommended to regulate it as a quarantine pest. The main pathways for introduction are plants for planting of host plants with trunks of more than 15 cm diameter, round wood of host plants of more than 15 cm diameter, sawn wood and wood packaging material. Plants for planting should originate from a pest-free area or come from a pest-free place of production with a buffer zone of at least 200 m. Round wood or sawn wood should come from a pest-free area or pest-free place of production or have been treated by fumigation, heat treatment, kiln drying or chemical pressure impregnation. Wood packaging should comply with ISPM no. 15 (ICPM, 2003).

It should be noted that there are separate possibilities of introduction from South America, and from the infested area in Italy. In practice, the risk of further entry from South America is low, because there is practically no existing trade in host plants or wood from the countries concerned to the EPPO region. The risk of movement with wood packaging is adequately covered by ISPM no. 15. Within the EPPO region, there is relatively little prospect of movement of the large plants for planting which would be capable of carrying the pest. The significant risk is from the movement of poplar wood.

Acknowledgement

This datasheet was prepared by Dr I M Smith (former Director General of EPPO) on the basis of a datasheet prepared by Dr G. Allegro (CRA – Istituto di Sperimentazione per la Pioppicoltura, IT).

References

Alfaro R, Gonzalez P, Villaverde R, Battaglino N, Allegro G & Humble L (2004) The threat of the ambrosia beetle, *Platypus sulcatus (= mutatus)* to world poplar resources. *XXII FAO/IPC Session*, Santiago (CL).

Alfaro R. (2003) [*Platypus mutatus*: a major pest of poplar in Argentina. Action plan.] *SAGPyA Forestal* **28**, 11–18 (in Spanish).

Allegro G & Della Beffa G (2001) [A new entomological problem for Italian poplars.] *Foreste ed alberi oggi* **66**, 31–34 (in Italian).

Allegro G (1990) [Animal pests of poplar and willow in Argentina.] *Cellulosa e Carta* **4**, 18–22 (in Spanish).

Bascialli ME, Giménez RA, Etiennot AE & Toscani H (1996) [Management of *Platypus sulcatus* populations over a three-year period in the Paraná Delta region by chemical control.] *Investigaciones Agrarias: Sistemas y Recursos Forestales* **5**, 129–140 (in Spanish).

Carella D & Spigno P (2002) [*Platypus mutatus* passes from poplar to fruit trees.] *Bollettino del Laboratorio di Entomologia Agraria, Filippo Silvestri* **58**, 139–141 (in Italian).

EPPO (2007) Pest Risk Analysis record for *Megaplatypus mutatus* [http://www.eppo.org/QUARANTINE/Pest_Risk_Analysis/PRA_documents.htm, last accessed 2008-12-06].

Etiennot AE, Giménez RA & Bascialli ME (1998) [*Platypus sulcatus*: distribution of attack according to the diameter at chest height of *Populus deltoides* and efficiency evaluation of herbicides]. *Primeiro Simposio Argentino-Canadiense de Protección Forestal*. Buenos Aires (AR) (in Spanish).

Giménez RA & Etiennot AE (2002) [Short note: chemical control of *Platypus sulcatus* on poplar.] *Investigaciones Agrarias: Sistemas y Recursos Forestales* **11**, 227–232 (in Spanish).

Giménez RA & Etiennot AE (2003) Host range of *Platypus mutatus*. *Entomotropica* **18**, 89–94.

Giménez RA, Etiennot AE, Bascialli ME & Toscani H (1995) [Efficacy of various insecticides in the control of *Platypus sulcatus* en the Paraná Delta.] *IX Jornadas Fitosanitarias Argentinas*, *Mendoza* (in Spanish).

González Audino P, Villaverde R, Alfaro R & Zerba E (2005) Identification of volatile emissions from *Platypus sulcatus* and their pheromonal activity. *Journal of Economic Entomology* **98**, 1506–1509.

Guerrero RT (1966) [A new fungus anamorph associated with *Platypus sulcatus*.] *Revista de Investigaciones Agropecuarias* **5 III**, 97–103 (in Spanish).

ICPM (2003) International Standards for Phytosanitary Measures no. 15. *Guidelines for Regulating Wood Packaging in International Trade*. FAO, Rome (IT).

Santoro F.H. (1965a) [Description of the five larval instars and the pupa of *Platypus sulcatus*.] *IDIA Suplemento Forestal* **2**, 49–58 (in Spanish).

Santoro F.H. (1965b) [Three trials on preventive chemical control of *Platypus sulcatus*.] *IDIA Suplemento Forestal* **2**, 59–64 (in Spanish).

Santoro FH (1962) [Basis for the control of *Platypus sulcatus*.] *Revista de Investigaciones Forestales* **3**, 17–23 (in Spanish).

Santoro FH (1963) [Biology and ecology of *Platypus sulcatus*.]. *Revista de Investigaciones Forestales* **4**, 47–79 (in Spanish).

Santoro FH (1967) [New results on the control of *Platypus sulcatus*.] *IDIA Suplemento Forestal* **4**, 70–74 (in Spanish).

Schedl KE (1972) *Monographie der Familie Platypodidae (Coleoptera)*. (Ed. Verlag Dr. W & Junk NV) Den Haag (NL) (in German).

Toscani HA (1990) [Manual for protection of forest plantations in the Paraná Delta area.] *13th Session FAO/IPC Working Party on Insects and other Animal Pests, Buenos Aires, March 1990*, FO:CIP:I/90/1 (INDECHIFFRABLE).

Tremblay E, Espinosa B, Mancini D & Caprio G (2000) [A beetle from South America is threatening poplars.] *L'Informatore Agrario* **48**, 89–90 (in Italian).