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

Data sheets on quarantine pests
Fiches informatives sur les organismes de quarantaine

Tetropium gracilicorne

Identity

Name: *Tetropium gracilicorne* Reitter
Taxonomic position: *Insecta*: *Coleoptera*: *Cerambycidae*
Common Name: fine-horned spruce borer (English); тонкоусый еловый усач (Russian)
EPPO code: TETOGR
Phytosanitary categorization: EPPO A2 action list no. 311

Hosts

T. gracilicorne attacks species of *Abies*, *Larix*, *Picea* and *Pinus*, especially *Larix gmelinii*, *Larix sibirica*, *Pinus sibirica*, *Pinus koraiensis*, *Pinus sylvestris*, *Abies nephrolepis*, *Picea ajanensis* (Pavlovskii & Shtakelberg, 1955; Issaev & Tarassova, 1965; Issaev, 1966; Ivliev & Kononov, 1966; Averenski, 1971; Pupavkin & Chernenko, 1979, 1981; Maslov, 1988; Ler, 1996).

Geographical distribution

EPPO region: Russia (all Siberia, including extreme North, Transbaikalia, Far East). *T. gracilicorne* was introduced into Kamchatka where it spread rapidly and is now an important pest (Mamaev *et al*., 1989)
Asia: Russia (all Siberia including extreme North, Transbaikalia, Far East), China (Heilongjiang), Japan (Hokkaido, Honshu), Kazakhstan, Mongolia (north), probably also Democratic People's Republic of Korea (Plavilshchikov, 1940; Pavlovskii & Shtakelberg, 1955; Petrenko, 1965; Issaev, 1966; Ivliev & Kononov, 1966; Rozhkov *et al*., 1966; Cherepanov, 1979; Lindeman, 1979; Pupavkin & Chernenko, 1979, 1981; Yanovskii, 1979; Mamaev B., 1985, 1990; Shamaev, 1994; Vorontsov, 1995; Ler, 1996)
EU: absent

Biology

Mass flight of *T. gracilicorne* occurs from the beginning of June until the end of July, although some specimens may be found until September. The pest occurs in mountains up to an altitude of 2000–2100 m. It may attack trees without symptoms of stress, but also stressed, dying and recently cut trees. It attacks all parts of the trunk from root spurs to the top of the crown. The female usually lays eggs in cracks in the bark, often 3–5 eggs at the same place. Young larvae make individual galleries of irregular shape from the entry gallery. They need fresh food and make galleries first in the phloem, and then in the sapwood. In August, they reach a depth of 4–5 cm in the wood where they continue to feed and stay for overwintering. If they develop in the part of the trunk with thick bark, they may overwinter under the bark without entering the wood. Pupation takes place in May–June. The pupation cell is 16–22 mm long and 7 mm wide, parallel to the surface of the trunk. Before pupation, the larva makes the oval emergence hole and closes it with frass. The developmental cycle of the pest takes one year (Petrenko, 1965; Issaev, 1966; Averenski, 1971; Cherepanov, 1979).

Detection and identification

Symptoms

Characteristic symptoms are: large entrance and emergence holes in trunks, peeling bark, borings at the base of infested trees, tunnels made by large larvae. The needles of attacked trees often show yellowing and wilting.

Morphology

Eggs
The egg is elongated, 1.4 mm long, 0.4 mm wide, widely rounded at one end, covered by small cells, narrowly rounded at the other end, covered by fine sculpture. There is usually also surface sculpturing between the two ends of the egg (Cherepanov, 1979).

Larva
The larva (Fig. 1) is yellowish-white. Before pupation it is 16–19 mm long and 2.8–3.0 mm wide, with darker pronotum and head and black mandibles. The head is orange, rounded at the front and has a brown longitudinal joint in the middle, and white frons joints. The lateral sides of the head are covered by long bristle-shaped hairs. The clypeus is white and strongly narrowed to the front. The labrum is white, transverse and oval.

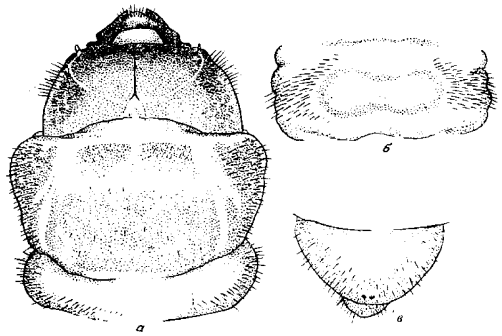

Fig. 1 Larva of *Tetropium gracilicorne*: a, head and pronotum; b, abdominal tergite with a dorsal ampulla (ambulatory wart); c, end of the abdomen (Cherepanov, 1979).

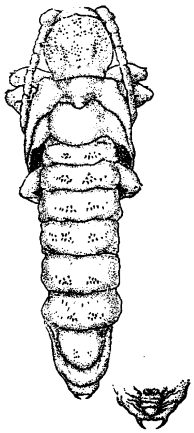

Fig. 2 Pupa of *Tetropium gracilicorne* (Cherepanov, 1979).

The pronotum is transverse, covered on the lateral sides by long dense hairs. The abdomen is covered on the lateral sides by small hairs. Dorsal ambulatory warts (ampullae) on first to the seventh segments are prominent, well sclerotized, with a common longitudinal fissure. The ninth abdominal tergite is glabrous on the disk, and has a pair of small thorns at the top, based on a common small prominence. The lateral sides of this segment are covered by long, dense, reddish hairs. The height of these thorns is usually less than their width at the base; the distance between thorns is almost equal to their width at the base. The weight of the larva before pupation is 38–138 mg (Cherepanov, 1979).

Pupa

The pupa (Fig. 2) has an elongated body and is 11–17 mm long and 3–5 mm wide. The head between the antennae is transverse and prominent. The antennae are clasped to the body; their segments have 1–2 acute thorns on the external sides. The pronotum is widened in the middle, narrowed to the front and to the back, covered by sparse bristles. The mesonotum is without clear thorns. The femurs have, at the top, a transverse row of bristle-shaped thorns. The abdomen is widened at the level of third and fourth segments, and then narrowed to the top. Abdominal tergites have multiple acute thorns from both sides of a common longitudinal fissure. The lateral sides of the abdominal sternites are covered by small hairs. The top of the abdomen has a pair of long urogomphal outgrowths, which finish by sclerotized thorns. The weight of the pupa is 34–108 mg (Cherepanov, 1979).

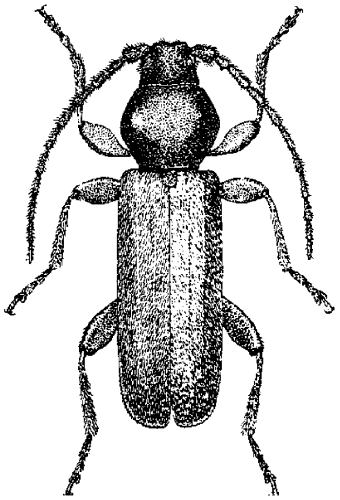

Fig. 3 Adult of *Tetropium gracilicorne* (Cherepanov, 1979).

Adult

The adult (Fig. 3) of *T. gracilicorne* is slightly flattened, 8–16 mm long. The head is short, rounded between antennae, and has no clear longitudinal fissure. The antennae are thin with slightly inflated second to fifth segments. They reach the base of the pronotum at the level of the sixth or the eight segment. The male antennae reach at least to half the length of the elytra; the female antennae reach to one-third of the length of the elytra. The first antennal segment is thick, only 1.5–2.0 times longer than its width. Other segments are thin. The fourth antennal segment is at least four times longer than the width of its top. The pronotum is bright, narrowed to the front and to the back, and covered by fine punctuation and sparse small hairs. The intervals between points are not much wider than the points or equal to them. The male pronotum is usually longer than wide; the female pronotum is usually as long as wide. The scutellum is widely rounded at the top, covered by dense punctuations from both sides of an even longitudinal fissure, and has parallel borders or is narrowed to the back. The elytra are elongated, rounded at the top; they have parallel borders and are covered by dense fine punctuations and sparse small hairs. The length of the elytra is 2.4–2.7 times longer then their width. The tarsus of the rear legs is shorter than the tibia, and its first segment is not longer than the others. Typically, the body of the beetle is black, the elytra are light-brown, and the legs and antennae are reddish-orange. Sometimes, the entire beetle is black. On other occasions, the body, legs and antennae are

black, and the elytra are light brown. The body and elytra may also be black, with legs and antennae orange or reddish. The weight of the neonate beetle is 23–87 mg (Plavilshchikov, 1940; Rozhkov *et al*., 1966; Cherepanov, 1979; Ler, 1996).

Pathways for movement

Natural spread of the pest by flying adults is rapid. Larvae, pupae and young adults can easily be transported in different types of wood commodities (including wood packaging) and would be difficult to detect by external inspection. *T. gracilicorne* is unlikely to be transported in planting material since the species does not attack branches, small trunks or roots which normally constitute planting material. However, larger plants of conifers of more than five years old are occasionally traded for transplanting, and such plants may be infested with eggs or larvae. The pest may also be carried as a contaminant of various commodities. In 1998, the pest was intercepted in Austria in larch wood originating from Siberia (Krehan & Holzschuh, 1999).

Pest significance

Economic impact

T. gracilicorne is one of the most important and common pests of conifers in the region of its present distribution. It may attack slightly stressed and even apparently healthy trees of different ages and continues to damage the same trees during several consecutive years causing their death. It attacks trees of different age and, even when it does not kill them, the infestation results in significant loss of vigour and of wood marketability (because of the bore holes). It especially attacks coniferous forests stressed by defoliators (primarily *Dendrolimus sibiricus*; OEPP/EPPO, 2005a) or damaged by diseases, forest fires or winds. Death of trees and forests may be caused by this species alone, or in association with *Melanophila guttulata*, *Xylotrechus altaicus* (OEPP/EPPO, 2005b), *Ips subelongatus* (OEPP/EPPO, 2005c), *Scolytus morawitzi* (OEPP/EPPO, 2005d) or other pests. (Kondakov & Kazachinskaya, 1964; Petrenko, 1965; Issaev, 1966; Ivliev & Kononov, 1966; Rozhkov *et al*., 1966; Cherepanov, 1979; Lindeman, 1979; Pupavkin & Chernenko, 1979, 1981; Yanovskii, 1979, 1995; Pleshanov, 1982; Maslov, 1988; Mamaev, 1990; Vorontsov, 1995; Ler, 1996). Its attacks are harmful to the forest environment.

Control

Control efforts are undertaken in the area of the present distribution of *T. gracilicorne*. Control measures include silvicultural and sanitary measures (improving the resistance of forests, cutting and elimination all infested trees; cutting of 'trapping trees' followed by their treatment), as well as treatments with chemical and biological products (Maslov, 1988; Vorontsov, 1995). Entomophages may play an important role in the regulation of populations, especially *Scoloposcelis obscurella* (Anthocoridae), *Udobius lentus* (Staphylinidae), *Thanasimus rufipes*, *Thanasimus substriatus*, *Trichodes ircutensis* (Cleridae), *Epuraea boreella*, *Epuraea longula* (Nitidulidae), *Phyto depressus* (Phytidae), *Laphria flava*, *Stenopogon albociliatus* (Asilidae), *Xylophagus cinctus* (Xylophagidae), *Medetera signaticornis* (Dolichopodidae), *Xorides ater*, *Neoxorides collaris* (Ichneumonidae), *Atanycolus initiator*, *Atanycolus denigrator*, *Doryctes mutillator* and *Helconidea dentipes* (Braconidae) (Yanovskii, 1976).

Phytosanitary risk

T. gracilicorne is considered as a very serious forest pest in areas where it occurs. It has recently spread to new areas (e.g. Kamchatka). It is likely to establish in all areas of coniferous forest within the EPPO region. As a known pest of *Pinus sylvestris*, its economic impact could be considerable. It is also known to attack species of *Picea*, *Abies* and *Larix* that occur in its natural range. These species hardly occur in the PRA area, but *T. gracilicorne* may be able to attack other species of these genera. The potential importance of *T. gracilicorne* for the western part of the EPPO region is reinforced by the recent considerable increase in trade of coniferous wood from Russia.

Phytosanitary measures

T. gracilicorne was added in 2002 to the EPPO A2 action list, and endangered EPPO member countries are thus recommended to regulate it as a quarantine pest. It is also regulated as a quarantine pest by Korea and Cuba (Shamaev, 1994; Bagdanov *et al*., 2001). Phytosanitary measures for its exclusion could include origin of consignments from a pest-free area. Wood packaging should respect ISPM no. 15 (ICPM, 2003). Wood of host species should be free from bark and from grub holes greater than 3 mm, or heat-treated, or otherwise treated.

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