EPPO Datasheet: *Trirachys sartus*

Last updated: 2020-06-10

IDENTITY

Preferred name: *Trirachys sartus*
Authority: (Solsky)
Taxonomic position: Animalia: Arthropoda: Hexapoda: Insecta: Coleoptera: Cerambycidae
Other scientific names: *Aeolesthes sarta* (Solsky), *Pachydissus sartus* Solsky
Common names: Uzbek longhorn beetle, city longhorn beetle, sart longhorn beetle, town longhorn beetle
view more common names online...
EPPO Categorization: A2 list
view more categorizations online...
EU Categorization: A1 Quarantine pest (Annex II A)
EPPO Code: AELSSA

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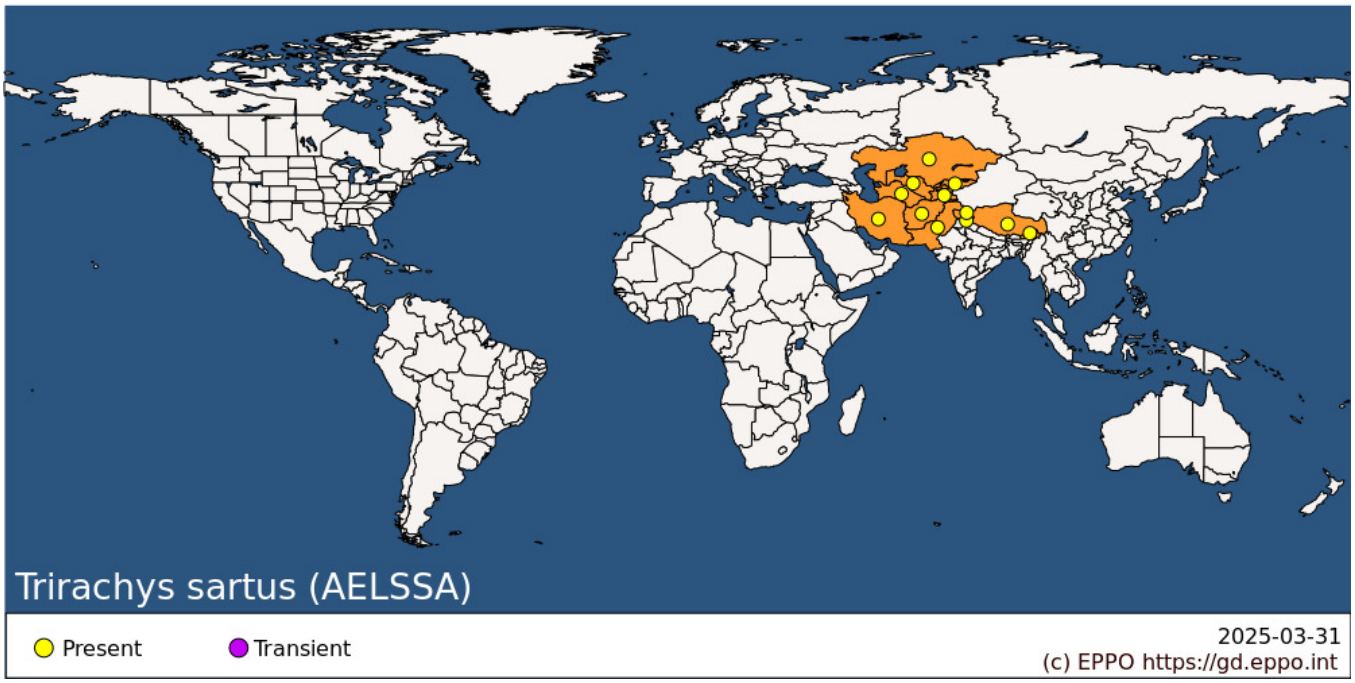
HOSTS

Trirachys sartus is polyphagous on woody plants. The preferred hosts are *Populus, Ulmus, Platanus, Salix, Juglans*.

Host list: *Acer cappadocicum, Acer negundo, Acer sp., Aesculus indica, Aesculus sp., Alnus subcordata, Betula sp., Carya sp., Castanea sp., Corylus colurna, Cydonia oblonga, Cydonia sp., Elaeagnus angustifolia, Elaeagnus sp., Fraxinus sogdiana, Fraxinus sp., Gleditsia triacanthos, Juglans regia, Juglans sp., Malus domestica, Malus sp., Malus sylvestris, Morus sp., Platanus orientalis, Platanus sp., Platanus x hispanica, Populus alba, Populus ciliata, Populus euphratica, Populus nigra, Populus sp., Populus x canadensis, Prunus armeniaca, Prunus dulcis, Prunus padus, Prunus persica, Prunus sp., Pyrus sp., Quercus sp., Robinia pseudoacacia, Robinia sp., Salix acmophylla, Salix alba, Salix babylonica, Salix sp., Salix tetrasperma, Ulmus laevis, Ulmus minor, Ulmus pumila, Ulmus sp., Ulmus wallichiana*

GEOGRAPHICAL DISTRIBUTION

The area of origin of *T. sartus* is thought to be Pakistan and Western India, from which it spread westwards to Afghanistan and Iran and northwards to the Central Asian countries; Tajikistan, Kyrgyzstan, Turkmenistan, Uzbekistan where it was first found in 1911 (in Samarkand, UZ). The pest continues to increase its range in these countries (Orlinski *et al.*, 1991; EPPO, 2005). *T. sartus* was also found in several poplar trees in South Kazakhstan (Shymkent), however, the researcher believes that the pest will not be able to survive there (Kostin, 1973). There is some information about findings in Japan, Malaysia and Sri Lanka (CAPS Program Resource, 2020) but more data is needed to confirm these findings. *T. sartus* is found usually in lower mountainous areas up to an altitude of 2000 m.



EPPO Region: Kazakhstan, Kyrgyzstan, Uzbekistan
Asia: Afghanistan, China (Xizhang), India (Arunachal Pradesh, Himachal Pradesh, Jammu & Kashmir), Iran, Islamic Republic of, Kazakhstan, Kyrgyzstan, Pakistan, Tajikistan, Turkmenistan, Uzbekistan

BIOLOGY

The life cycle of *T. sartus* takes two years (Kulinich, 1965; Ahmad *et al*., 1977; Orlinski *et al*., 1991; EPPO, 2005). Adults usually leave their pupation cells at an average daily temperatures from 15 to 20°C. The mass beetle emergence in Tajikistan (Dushanbe) was observed from the end of April to June at 15,7ºC (Kulinich, 1965), and in Pakistan from March to April (Ahmad *et al*., 1977). Beetles are generally active in the evening and night. During the daytime, the adults hide under the bark, in larval tunnels and in other refuges. After about 19:00, they leave their hiding places, males appearing first, and move about until morning on the surface of the particular tree on which they have developed. This species does not fly much and maturation feeding has not been observed. Just after exiting the hiding places, the adults begin mating. Males can mate multiple times.

Females lay eggs in slit-like niches in the bark of trunks and large branches shortly after leaving the pupation cells and continue oviposition for about two months. They lay 1–3 eggs at each site. Normally, one female lays 240–270 eggs in her lifetime (EPPO, 2005). The maximum number of eggs found in one female was 342 (Kulinich, 1965). Viable eggs are produced at a minimum temperature of 15°C, however, oviposition does not occur at temperatures below 10°C or above 35°C (Ahmad *et al*., 1977). Maximum egg hatch occurs at 22 to 24°C, 12 to 13 days following oviposition. The development of larvae in the egg lasts 9–17 days. Hatched neonate larvae are light coloured and about 2.5-4.0 mm long and by the end of summer they grow to 50-60 mm. Adult males live 7 to 15 days and females live 19 to 25 days (Ahmad *et al*., 1977).

Each larva makes its own tunnel (even if several eggs were laid together) in order to feed between the bark and the wood. Frass is ejected through the entry hole. Later, larvae enter the wood and, at the end of the first season of development, make a long (about 25 cm) tunnel which first rises parallel to the long axis of the trunk or branch and then turns to form a downward gallery of 15 cm. At the bottom of this gallery the larva overwinters protected by a double plug made from borings (EPPO, 2005).

The following spring, larvae continue to feed, making tunnels deep into the wood. At the end of July, they prepare pupation cells protected by double plugs made from borings. Pupation occurs in these cells and, after about two weeks, adults appear. The adults stay in the pupation cells over winter and leave them in spring (Kulinich, 1965; Ahmad *et al*., 1977; EPPO, 2005).

DETECTION AND IDENTIFICATION

Symptoms

Large elliptical emergence holes 3-3.5 ? 1.2-1.5 ?m in trunks and large branches, and frass at the basis of infested trees, are indications of the presence of the pest. The adult beetles are conspicuous and may be seen sitting on the trunks. Branch and tree dieback is easily detected by observation of wilting and drying leaves.

Morphology

Eggs

White, 3–4 mm long.

Larva

Neonate larvae are light coloured, 2.5-4.0 mm long. Full grown larvae are pale yellowish, covered with golden hairs, about 60–70 mm long, with black mandibles.

Pupa

First white, then brownish-grey, up to 45 mm long.

Adult

The adult of *T. sartus* has an elongated dark grey-brown body with elytra covered with short silvery hairs. Shiny silvery spots form two irregular bands crossing the elytra. Body length varies from 22 to 42.2 mm in males and 29.2 to 43 mm in females. The male has antennae 2.5 times as long as the body, whereas the female antennae are shorter than the body. Elytra obliquely truncate at the apex, the outer angle being unarmed and the sutural angle is dentate or shortly spine (Ahmad *et al*., 1977).

PATHWAYS FOR MOVEMENT

Adults of *T. sartus* are infrequent fliers and usually remain on the surface of the host tree on which they developed. In this regard, natural spread of the pest by adult flight is relatively slow (Kulinich, 1965; EPPO, 2005). The most likely pathway of *T. sartus* for introduction is infested wood, especially wood packaging material. Different life stages may readily be transported with untreated wood and large plants for planting moving in trade, because they remain concealed and difficult to detect. *T. sartus* is unlikely to be carried in small plants for planting (of forest, ornamental or fruit trees) as it does not attack small branches or seedlings. Adults may, however, be carried as contaminating pests on various commodities.

PEST SIGNIFICANCE

Economic impact

Trirachys sartus is one of the most important pests of many forest, ornamental and deciduous fruit trees in the region of its present distribution (Kulinich, 1965; Ahmad *et al*., 1977; Yagdyev, 1979, 1987; Sengupta & Sengupta, 1981; Krivosheina & Tokgaev, 1985; Khan et al., 2013). It attacks both stressed and healthy trees of different ages. Successive generations remain on the same tree for several consecutive years, eventually causing its death. Sometimes, young larvae encircle a tree feeding on the cambium, which leads to the rapid death of the tree. Young trees with thin bark are most susceptible to the beetle and 1–3 larvae may be enough to kill a tree (Kulinich, 1965). Gaffar and Bhat (1991) consider this beetle as one of the most destructive pests of walnut trees (*Juglans regia*) in India. Serious damage is also observed in shelter belts and in fruit (especially apple) orchards (Krivosheina, 1984; EPPO, 2005).

In nature the spread and damage to tees by *T. sartus* usually depends on the location of the plant growth. *T. sartus* is

more common in the valleys than in the mountains and it causes especially great damage to trees in the valleys. Kulinich (1965) reported that in the Beshkent and Vakhsh valleys (Tajikistan) (350-450 m above sea level) it was difficult to find trees that were not damaged by this pest. In the Gissar valley (800-850 m) there were fewer trees damaged by pest. The higher the mountains, the more difficult it is to find trees infested or damaged by *T. sartus*. However, single infected trees were also found at an altitude of more than 1800 m.

The most serious damage *T. sartus* is caused to urban plantations, which usually grow in unfavorable climatic conditions (poor watering, closely located road, etc.) and are less resistant to pests. For example, all large trees in Tashauz city (Turkmenistan) were destroyed because of *T. sartus* (Orlinski *et al*., 1991). Affected towns are usually situated in hot and dry climatic conditions, where large deciduous trees are particularly important for the urban environment, and are also difficult to grow. In this case, trees in cities located in the highlands can also be severely damaged by *T. sartus* (for example, in Kabul, 1800 m above sea level) (Kulinich, 1965).

Control

Major control efforts are undertaken in countries where *T. sartus* is present. Control measures include management actions (e.g. surveys in nurseries with burning of infested plants for planting, and felling and burning of all infested trees), planting more resistant species and varieties of trees, treatments with chemical and biological insecticides (Krivosheina, 1984; Gaffar & Bhat, 1991; Mohi-Uddin *et al.*, 2009). Many investigations have been performed on biological and microbiological control of the pest (Mamaev & Yagdyev, 1981; Arshad & Ha?z, 1983; Hanif & Chaudhry, 1992). Kamran *et al*. (2017) studied application the insect repellent technique against larval instars of *T. sartus* under field conditions but these methods have had little practical success.

Phytosanitary risk

T. sartus is absent from practically all EPPO regions (present only in southern Kyrgyzstan, southern Kazakhstan and Uzbekistan, and in the potential member countries Tajikistan and Turkmenistan). An EPPO PRA concluded that *T. sartus* is a serious pest in countries where it occurs, and already has a history of spread from the Indian subcontinent to Central Asia (EPPO, 2005; Orlinski, 2006). It has a wide host range. In view of the hot and dry climatic conditions of its countries of origin and present distribution, the endangered area is primarily the Mediterranean and other southern countries (such as Albania, Algeria, Bulgaria, Greece, Italy, Portugal, Romania). Its impact would most probably concern: plantations of *Populus*; *Platanus, Ulmus, Juglans* and other amenity trees in cities and parks; fruit trees; various tree species in forests. Infested large plants for planting and wood are the most likely pathways for introduction. Since there is at present little international trade in the wood of host plants of *T. sartus*, the main phytosanitary risk comes from untreated wood packaging material (especially dunnage). There have been two cases of *Trirachys s*p. interception in U.S. ports in wood packing material originating from India and China in 2013 (CAPS Program Resource, 2020).

PHYTOSANITARY MEASURES

In 2002, *Trirachys sartus* was added to the EPPO A2 List of pests recommended for regulation as a quarantine pest, and endangered EPPO member countries are thus recommended to regulate it as a quarantine pest. Phytosanitary measures could include requiring consignments originate from a pest-free area. Wood packaging materials should respect requirements of ISPM no. 15 (ISPM, 2018). International movement of wood of the host plants from countries where the pest is currently distributed does not seem very likely, but measures in that case could be debarking, grub-hole freedom, heat treatment, fumigation or other appropriate treatments.

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Datasheet history

This datasheet was first published in the EPPO Bulletin in 2005 and revised in 2020. It is now maintained in an electronic format in the EPPO Global Database. The sections on 'Identity', ‘Hosts’, and 'Geographical distribution' are automatically updated from the database. For other sections, the date of last revision is indicated on the right.

EPPO (2005) *Aeolesthes sarta*. Datasheets on quarantine pests. *EPPO Bulletin* **35**(3), 387-389. https://doi.org/10.1111/j.1365-2338.2005.00842.x

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