EPPO Datasheet: *Ips hauseri*

Last updated: 2020-11-20

IDENTITY

Preferred name: *Ips hauseri*
Authority: Reitter
Taxonomic position: Animalia: Arthropoda: Hexapoda: Insecta: Coleoptera: Curculionidae: Scolytinae
Other scientific names: *Ips ussuriensis* Reitter
Common names: Hauser's engraver, Kyrgyz mountain engraver
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EPPO Categorization: A2 list
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EPPO Code: IPSXHA



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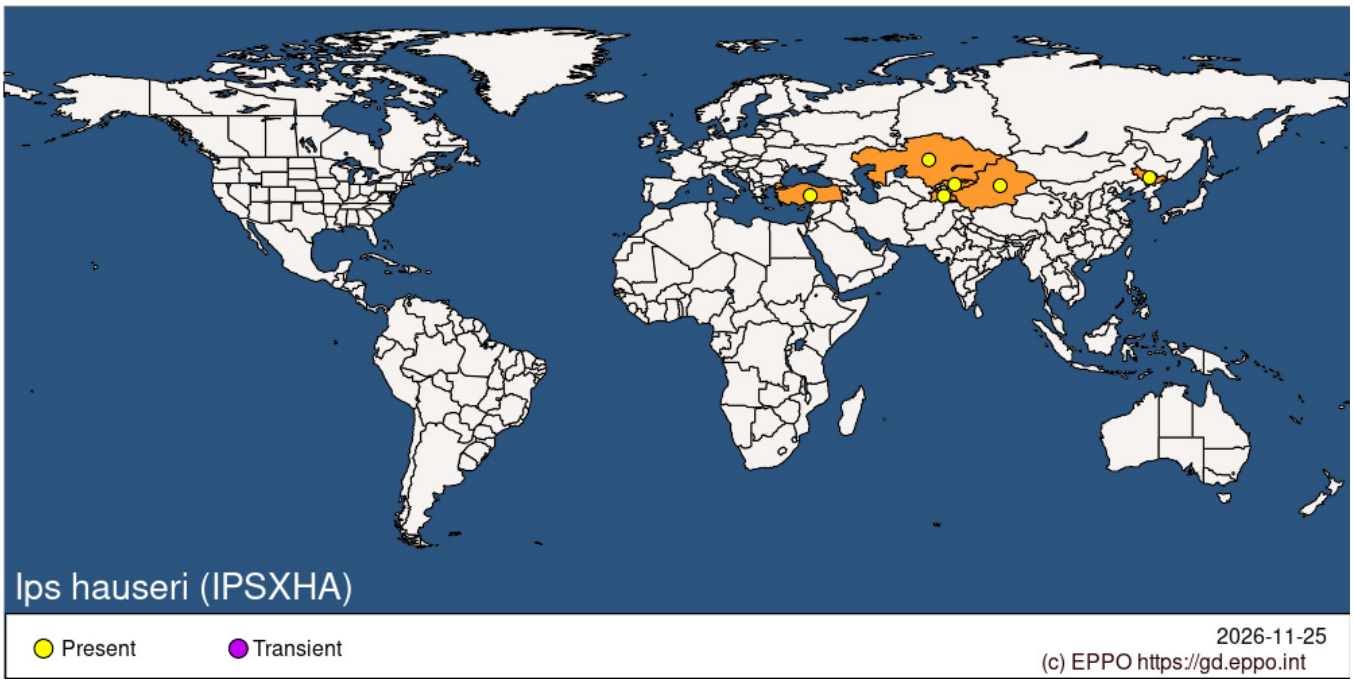
HOSTS

Ips hauseri attacks certain species of *Picea*, *Pinus* and *Larix*. In Kyrgyzstan, this species was considered as a monophagous pest of *Picea schrenkiana* but, after the introduction in 1930/1932 of *Pinus sylvestris*, *Pinus pallasiana* and *Larix sibirica* into this area, it became a serious pest of these trees, especially of *P. sylvestris* (Prutenskii & Romanenko, 1954; Pavlovskii & Shtakelberg, 1955; Makhnovskii, 1966; EPPO, 2020, online; CABI, 2020, online).

Host list: *Larix sibirica*, *Larix*, *Picea schrenkiana subsp. tianschanica*, *Picea schrenkiana*, *Picea*, *Pinus nigra subsp. pallasiana*, *Pinus nigra*, *Pinus sylvestris*, *Pinus*

GEOGRAPHICAL DISTRIBUTION

It was considered that *I. hauseri* is an endemic species of the Tien Shan mountains of China and Kyrgyzstan and its distribution limited to the *Picea schrenkiana* forests of the Central and West Tien Shan by the mountain ranges of Dzhungarsky, Zailiisky, Kungei and Terskei Ala Tau, as well as of the Chatkalski and Ferganski (Stark, 1952). Later, this species was found in areas of neighbouring countries (Kazakhstan and Tajikistan) and Turkey, where it infested *Picea schrenkiana* as well as pine and larch trees (Prutenskii & Romanenko, 1954; Kostin, 1964; Maslov, 1988; EPPO, 2005; Kadyrov, 2007; Alonso-Zarazaga *et al*., 2017; Douglas *et al*., 2019).



EPPO Region: Kazakhstan, Kyrgyzstan, Türkiye
Asia: China (Jilin, Xinjiang), Kazakhstan, Kyrgyzstan, Tajikistan

BIOLOGY

The area of origin of *I. hauseri* is the mountains of Central Asia where the Schrenk's spruce *P. schrenkiana* grow. Its rate of development depends on altitude, and also on the position and exposure of the host tree. The developmental cycle takes one year at altitudes of 2200–3200 m, whereas at 1200–1400 m, the pest develops two complete generations per year. The flight period of *I. hauseri* lasts from the beginning of May to the end of June. In accordance with the research carried out in the Medeo mountains (Kazakhstan), at an altitude of 2244 m with a temperature of 12-14 °C the beetle flights begin in the first decade of May (Mandelshtam *et al*., 2019; Petrov *et al*., 2019). Adults make emergence holes, leave pupation cells and begin additional feeding. They usually ?y during sunny days. The number of emergence holes is usually less than the number of emerging beetles because some use holes made by other individuals. Where there are two generations per year, the development of the first generation (from eggs to adults) takes an average of 40 days. The additional feeding of young beetles takes place in the bark of trees where larval development occurred and lasts longer than the larval feeding, approximately 40–50 days. Additional feeding galleries have irregular shapes and are oriented lengthwise along the trunk. When the bark is thin, the insects are sometimes obliged to move to another feeding site but, where the bark is thick, they usually finish the feeding phase in the same area. At altitudes of 1200–1400 m, young beetles of the first generation start to lay eggs at the beginning of August. Young adults of the second generation appear in September/October. The species usually overwinters in the adult stage, less often in the larval stage. Young adults overwinter under the bark, close to the site of larval development.

I. hauseri may attack trees without symptoms of stress, but also stressed, dying and recently cut trees. It prefers to attack trunks and large branches of mature trees situated in well-lit locations but, at a high population level, it may also attack young trees of 5–6 cm in diameter. It usually begins to attack the top parts of trunks, and branches larger than 5–6 cm in diameter in the top of the crowns. Then, its attacks by new arriving beetles move down along the trunk. Finally, the pest occupies the entire trunk from the root collar to the top of the crown. In comparison with other spruce bark beetles, *I. hauseri* increases its population numbers very rapidly (Parfentiev, 1951; Prutenskii & Romanenko, 1954; Makhnovskii, 1966; Toktoraliev, 1979a; Toktoraliev *et al*., 1984; Maslov, 1988).

I. hauseri is polygamous. Each pest family group usually includes one male and 2–8 females (usually 3–5 females). Female galleries start from a common copulation chamber and go either downwards (most frequently) or upwards in the tree. The female gallery may reach 8–14 cm in length and 1.5–3.0 mm in width. Galleries are free from frass. One female lays 20–45 eggs, and one family produces 40–160 eggs (80 on average). Eggs are laid in special holes made by the female on both sides of the female gallery. The intervals between these holes are shorter at the

beginning of the female gallery and longer at the end. Some holes do not contain eggs. Larval galleries are short, they reach 3–4 cm in length, are much widened at the end and finish with pupation cells. Galleries are made mainly in the phloem and bark on lower trunk parts of *P. schrenkiana* but in the sapwood and phloem of upper parts. On young *P. sylvestris*, galleries are only in the sapwood and phloem. At low altitudes, egg development takes 9–15 days, larval development takes 20–25 days, and pupae development takes 8–13 days. At high altitudes, the development of the different stages takes much longer (Parfentiev, 1951; Prutenskii & Romanenko, 1954; Makhnovskii, 1966; Toktoraliev, 1979b).

DETECTION AND IDENTIFICATION

Symptoms

The characteristic symptoms of *I. hauseri* are: the frass on the bark surface, the flow of resin coming from the places where attempts have been made to enter the bark, species-specific gallery systems with a central chamber and radial female and larval galleries, and sparse crowns of coniferous trees with partly dead tops and branches. The needles of attacked trees often show yellowing or reddening and wilting beginning from the tops of trees.

Morphology

Larva

The larvae and adults are similar in size. They are white, cylindrical and legless, with small, brown, chitinous heads and brown mandibles (see Kalina, 1969).

Adult

Adults of *I. hauseri* are reddish-black, bright, with an elongated body, 3.5–5.3 mm long, 2.6-2.8 times longer than wide. The whole body is covered by sparse yellowish-brown hairs. Intervals between longitudinal fissures on the elytra are not punctuated. At the tail end, each elytrum has four teeth situated around the elytral declivity. For males, the third, finger-shaped tooth is the widest and longest. Female teeth are smaller than male teeth and are almost uniform in size. The surface of the elytral declivity is mat (Prutenskii & Romanenko, 1954; Douglas *et al*., 2019).

Detection and inspection methods

Symptoms of *I. hauseri* attacks (frass, resin flow, etc.) are easy to detect by visual examination. In addition, the nuptial chambers, maternal galleries, larvae and pupae are easy to find under the bark. In the later phase of infestation, the entrance holes and galleries under the bark can be found on standing trees. Similar symptoms can also be observed on fallen trees or logs.

PATHWAYS FOR MOVEMENT

Natural spread by adult flight is limited. All life stages of *I. hauseri* may be easily transported with untreated spruce, pine and larch wood commodities having bark, and with infested cut branches (including Christmas trees). Beetles may be present on the surface of trunks, young beetles may stay under the bark. Eggs, larvae and pupae may remain under the bark too. It is difficult to detect the pest at an early stage of tree or branch infestation.

PEST SIGNIFICANCE

Economic impact

It is considered that *I. hauseri* is the most important xylophagous pest of *Picea schrenkiana* in the region of its present distribution (Lynch *et al*., 2019). Its importance is considered comparable to that of *Ips typographus* on other species of spruce. After introduction of *P. sylvestris, P. pallasiana* and *L. sibirica* into Central Asia in the 1930s, it

became an important pest of these trees, particularly of *P. sylvestris*. The pest may attack slightly stressed and apparently healthy trees of different ages but it prefers to attack mature trees and, even when it does not kill them, the infestation results in significant loss of vigour and decrease of wood and seed production as well as reduction in wood marketability. The pest mainly occurs in mountain forests, which are very important for soil protection against erosion and, in many cases, causes the death of forests. Its capacity for very fast development, with rapid population build-up, increases the injuriousness of *I. hauseri*. The pest is usually the first to attack almost healthy or slightly stressed trees, and then is often followed by outbreaks of other wood borers. *I. hauseri* often kills plantations of spruce and pine trees in Kazakhstan and Kyrgyzstan (Prutenskii & Romanenko, 1954; Kostin, 1964; Lynch *et al*., 2019). A survey of spruce trees in Kazakhstan (Medeo) shows that *I. hauseri* usually infests the spruce *Picea schrenkiana* together with other pests such as *Dryocoetes autographus, Hylastes substriatus, Hylurgops palliatus, Orthotomicus suturalis, Pityophthorus kirgisicus, Trypodendron lineatum* (Mandelshtam *et al.*, 2019; Petrov *et al*., 2019). *I. hauseri* is particularly dangerous in years of drought (Parfentiev, 1951; Pavlovskii & Shtakelberg, 1955; Marikovskii, 1956; Makhnovskii, 1966; Toktoraliev, 1979a,b; Toktoraliev *et al.*, 1984; Lynch *et al*., 2019).

Control

Official control efforts are undertaken in the area of the present distribution of *I. hauseri*. Control measures include silvicultural and sanitary measures (improving the resistance of forests, cutting and elimination of all infested trees, cutting of 'trap trees' followed by their treatment), treatments with chemical products. Natural enemies do not apparently play a significant role in regulation of *I. hauseri* populations (Toktoraliev *et al*., 1984).

19 entomophagous species have been found in *I. hauseri* galleries. The most predominant is *Corticeus fraxini* which is a typical predator of *I. typographus* (Nikityuk, 1957). It actively feed on the larvae, pupae and young beetles of *I. hauseri*. *Nudobius lentus* is an active predator of *I. hauseri* eggs. Several Staphylinidae spp., such as *Placusa complanata, Phloeonomus lapponicus* were found in galleries *of I. hauseri* (CABI, 2020, online).

In recent years, much attention has been paid to apply against bark beetles, in particular against *Ips typographus*, the European ant beetle *Thanasimus formicarius*. It is assumed that this predator can also be applied against *I. hauseri* (Gninenko *et al*., 2016). The most widespread parasites *of I. hauseri* are *Dinotiscus eupterus* and *Rhopalicus tutela* (CABI, 2020, online) but natural enemies do not apparently play a significant role in regulation of *I. hauseri* populations (Toktoraliev *et al*., 1984).

Phytosanitary risk

The natural range of *I. hauseri* includes mountainous regions in Central Asia, with a climate similar to that in many parts of North and Central Europe. This pest is therefore likely to find suitable conditions and susceptible host plants (notably, *P. sylvestris*) in many areas within the EPPO region. If introduced into these areas, it is likely to be a serious forest pest, as it is in the areas where it now occurs.

PHYTOSANITARY MEASURES

In 2004, *I. hauseri* was added to the EPPO A2 list of pests recommended for regulation as quarantine pests. Measures used for other *Ips* spp. would also be suitable for *I. hauseri*. The following phytosanitary measures recommended by the EPPO Standard PM 8/2 (3) 'Coniferae' (EPPO, 2018) are considered to be effective against bark beetles including *I. hauseri*. Plants for planting, cut branches (including cut Christmas trees), round wood or other parts of the host plants of *I. hauseri* from countries in which *I. hauseri* is present should originate from a pest-free area. If not, the following phytosanitary measures are required to import round wood from the area where the pest is present: wood should be bark-free or heat-treated (EPPO, 2009a), or fumigated with appropriate fumigant, or treated with ionizing radiation (EPPO, 2009b). Harvesting wood residues, processing wood residues, hogwood and wood chips of the host should be produced from debarked wood or heat-treated. The heat treatment is also required for import of isolated bark. Wood packaging materials should meet requirements of ISPM no. 15 (I???, 2018). When wood with bark is moved in international trade, it should be transported through the pest-free areas, or outside of the pest flight period, or to be in closed containers to prevent infestation.

REFERENCES

Alonso-Zarazaga MA (coordinator), Barrios H, Borovec R, Bouchard P, Caldara R, Colonnelli E, Gültekin L, Hlavá?, Korotyaev PB, Lyal CHC, Machado A, Meregalli M, Pierotti H, Ren L, Sánchez-Ruiz M, Sforzi A, Silfverberg H, Skuhrovec J, Trýzna M, Velázquez de Castro AJ, Yunakov NN (2017) Cooperative Catalogue of Palaearctic Coleoptera Curculionoidea. Monografías electrónicas Sociedad Entomológica Aragonesa (SEA) 8, 729 pp. http://sea-entomologia.org/monoelec.html

CABI Invasive Species Compendium, online. Datasheet report for *Ips hauseri.* Available online: https://www.cabi.org/isc/datasheet/28826 [Accessed: 20 October 2020].

Douglas HB, Cognato AI, Grebennikov V, Savard K (2019) Dichotomous and matrix-based keys to the *Ips* bark beetles of the World (Coleoptera: Curculionidae: Scolytinae). *Canadian Journal of Arthropod Identification* **38**: 234 pp. doi: 10.3752/cjai.2019.38 http://cjai.biologicalsurvey.ca/dcgs_38/dcgs_38.html

EPPO (2005) Data sheets on quarantine pests. *Ips hauseri*. *EPPO Bulletin* **35**, 450–452.

EPPO (2009a) Standard PM 10/6 Heat treatment of wood to control insects and wood-borne nematodes. *EPPO Bulletin*, **39**, 31.

EPPO (2009b) Standard PM 10/8 Disinfestation of wood with ionizing radiation. *EPPO Bulletin*, **39**, 34–35.

EPPO (2018) Standard PM 8/2 (3) ‘Coniferae’. *EPPO Bulletin*, **48**(3), 463–494.

Gninenko YuI, Khegai IV (2016) [The ant beetle is an important entomophage of European spruce bark beetle]. *Zashchita i karantin rasteniy* **4**, 46–48 (in Russian).

I??? (2018) International Standards for Phytosanitary Measures no. 15. Guidelines for Regulating Wood Packaging in International Trade. FAO, Rome (IT).

Kadyrov AKh (2007) Complex of wood-boring and intra-stemmed beetles (Scolytidae, Cerambycidae, Buprestidae) in the south-eastern part of Central Asia. Dushanbe. Tajik National State University, 1-275 (in Russian).

Kalina V (1969) Larvae of European bark beetles (Coleoptera, Scolytidae). *Studia Entomologica Forestalia* **1** (13–22); **2**(41–61).

Kostin IA (1964) [Trunk Pests of Coniferous Forests of Kazakhstan.] Izdatel’stvo Akademii Nauk Kazakh SSR, Alma-Ata (KZ) (in Russian).

Lynch AM, Mukhamadiev NS, O’Connor CD, Panyushkina IP, Ashikbaev NA, Sagitov AO (2019) Tree-ring reconstruction of bark beetle disturbances in the *Picea schrenkiana* Fisch. et Mey. forests of Southeast Kazakhstan. *Forests* **10**, 912 (in Russian). https://doi.org/10.3390/f10100912

Makhnovskii IK (1966) [Kyrgyz mountain engraver, or Hauser’s engraver *Ips hauseri* Reitter.]. In: [*Pests of Mountain Forests and their Control.*] Lesnaya Promyshlennost’, Moscow, 49–52 (in Russian).

Mandelshtam MYu, Petrov A V (2019) A key to species of the tribe Hylastini LeConte, 1876 (Coleoptera: Curculionidae: Scolytinae) from Russia and adjacent countries. *Russian Entomological Journal* **28**(4), 389–399 doi: 10.15298/rusentj.28.4.08.

Marikovskii PI (1956) [Inter-speci?c relations of bark beetles living on *Picea Schrenkiana*.] In: [*Proceedings of the Institute of Zoology and Parasitology, Frunze.*] **5**, 132–141. Izdatel’stvo Akademii Nauk Kyrgyz SSR, Frunze (KG) (in Russian).

Maslov AD (1988) [*Guide to Forest Protection against Pests and Diseases*.] Agropromizdat, Moscow (in Russian).

Nikityuk AI (1957) Khishnye i paraziticheskie nasekomye kak regulyatory vredonosnoj deyatel'nosti i rasprostraneniya koroedov khvojnogo lesa. Soob. 3 *Bullet. MOIP*, otd. biol., 1957, **612**(5), 51-55 (in Russian).

Parfentiev VY (1951) [Bark beetles and longhorn beetles of *Picea schrenkiana*.] *Entomologicheskoe Obozrenie* **31**, 428–434 (in Russian).

Pavlovskii EN, Shtakelberg AA (1955) [Guide to Forest Pests.] Izdatel'stvo Akademii Nauk SSSR, Moscow–Leningrad (RU) (in Russian).

Petrov AV, Mandelshtam MYu, Beaver RA (2019) A key to species of the tribe Scolytini Latreille, 1804 (Coleoptera: Curculionidae: Scolytinae) from Russia and adjacent countries. *Russian Entomological Journal* **28**(3), 286–302 doi: 10.15298/rusentj.28.3.08

Prutenskii DI, Romanenko KE (1954) [*Ips hauseri*. Its role and importance for the death of forests of *Picea schrenkiana* and *Pinus sylvestris* in Kirgizia]. In: *Proceedings of the Institute of Botany & Plant Industry*, Izdatel'stvo Kirgizskogo Otdeleniya Akademii Nauk SSSR, Frunze (KG) **1**, 177–191 (in Russian).

Stark VN 1952 [Fauna of the USSR. Bark beetles (Ipidae [Scolytidae])]. Izdatel'stvo Akademii Nauk SSSR, M.- L. **31** (in Russian).

Toktoraliev BA (1979a) [Injuriousness of trunk pests of *Picea schrenkiana* at Lake Issyk-Kul.] In: *Problems of Forest Protection*, Moskovskii Leso-Tekhnicheskii Institut, Moscow **105**, 86–90 (in Russian).

Toktoraliev BA (1979b) [*Ips hauseri* – a pest of *Picea schrenkiana* in the Ala-Tau forests of Tersk.] In: *Forest Protection*, Izdatel'stvo Leningradskoi LesoTekhnicheskoi Akademii, Leningrad (RU) **4**, 96–99 (in Russian).

Toktoraliev BA, Baidoolotov NB, Tro?mov VN (1984) [Particularities of distribution of *Ips hauseri* and its entomophages on occupied trunks of *Picea schrenkiana*] In: [*Entomological Studies in Kirgizia.*], Ilim, Frunze (KG) **17,** 40–43 (in Russian).

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Datasheet history

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EPPO (2005) Data sheets on quarantine pests - *Ips hauseri*. *EPPO Bulletin* **35**(3), 450-452. https://doi.org/10.1111/j.1365-2338.2005.00881.x

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