

Wang, Zhanting 1992. *Scolytus schevyrewi* Semenov, pp 633-634. In G. Xiao [ed.], Forest Insects of China (2nd edition). China Forestry Publishing House, Beijing, China.

Distribution

Heilongjiang, Hebei, Henan, Shaanxi, Ningxia, and Xinjiang of China, and the central Asia region of former Soviet Union.

Hosts

Siberian elm (*Ulmus pumila*), European white elm (*U. laevis*), Japanese elm (*U. davidian* var. *japonica*), and willows according to the literature.

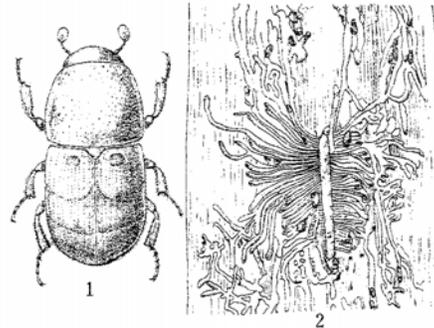


图 371 脐眼小蠹
1. 成虫 2. 坑道
(翟肖瑾绘)

Fig. 371 *Scolytus schevyrewi* Semenov
1. Adult 2. Galleries (by Qu Xiaojin)

Morphology

Adults. Body 3.19 - 4.17 (average 3.64) mm long, varied among individuals. No significant size difference between sexes. Head black, antennae yellow to yellow-brown in color. Frons slightly protruding, with striations running toward the clypeus for females; and flat to concave, with yellow, inwardly curved frontal hairs on the peripheral edges for males. Pronotum 1.39 mm long, 1.54 mm wide (length:width = 1:1.10), red-brown for the anterior and posterior margins, with a punctuated dark-brown central area. Scutellum black. Elytra red-brown to black-brown in color, with slightly runcinate lateral and posterior margins. A slightly darker band or fascia (1.87 mm long, 1.55 mm wide) may exist in some individuals between the central and the lower quarter region of the elytra. Thoracic pleura and abdomen black. Legs red-brown, with yellow-brown villi. Femur contains dark-brown blotches at the base and the tip. Sterna extremely retracted toward the notum from the 2nd segment and beyond, resulting in an obtuse angle with the 1st sternite. Verruca on the 2nd sternite black, flat and wide at the tip. The 7th tergum of male contains a pair of long setae.

Eggs. Eggs are oval, 0.82 × 0.56 mm (length × width), white and semi-transparent when newly deposited, turn to milk-white later and creamy yellow before hatch.

Larvae. Mature larvae milk-white in color, 4.8-7.5 mm long. Head capsule creamy yellow in color, with its posterior portion retracted into prothorax. Mandibles black, labrum white.

Pupae. Milk-white in color, 3.5-4.8 mm long. Front wings reach the 5th sternite, with circular carinae on the upper surface. Hind wings longer than front wings so that they touch each other at the tips. There is a pair of acicular protuberances on the posterior margin of each abdominal tergum, with the most prominent found from 3rd to 7th segment.

Biology

In Kuitun region of Xinjiang Uygur Autonomous Region, *S. schevyrewi* has 2-3 generations a year. It overwinters as mature larvae. Larvae start to pupate in early April when temperatures reach 15 °C. Pupation peaks in mid-April. Adult emergence begins in

late April and peaks in early May. Larvae of the first generation start to pupate in late May to early June, with adult emergence peaking in early July and ending in late July. The majority of the 2nd generation larvae construct pupal chambers for overwintering, while a minority of the 2nd generation continue with pupation and eclosion and complete a third generation. *S. schevyrewi* has overlapping generations in Kuitun throughout the year due to long adult longevity, a long oviposition period, and development under widely different environmental conditions.

Newly eclosed adults remain in their pupal chambers for 2-5 d before boring out of the tree. Most (ca. 80%) of the adults emerge between 14:00 to 20:00 hours. New adults conduct maturation feeding on bark at the crotches of tender twigs before moving to the trunks to reproduce. Females enter the tree trunk through the bark and construct individual egg galleries. The egg gallery is a single, vertical gallery located in the cambial region above the entrance hole, 4-6 cm (max. 9 cm) long. Males search the trunk for entrance holes and then mate with the females at the entrance to the egg gallery. Therefore, there is no nuptial chamber in the egg gallery. Males can mate multiple times.

The female chews egg niches along the gallery wall while constructing the egg gallery and lays an individual egg inside each niche before sealing it with sawdust. Egg niches are closely arranged in an array. An average egg gallery contains 23-123 egg niches, but usually above 60 eggs. Females guard the entrance of their egg galleries until death.

Eggs begin to hatch in the order that the female laid them when she constructed her gallery. Newly hatched larvae feed in the cambial region as they construct their individual larval galleries. Larval galleries are at first perpendicular to the original parental egg gallery but they later turn upward or downward. Some larval galleries may also meander or cross with each other. High population densities of larvae lead to a completely girdled cambial region due to the criss-crossing of larval galleries. There are five larval instars. Mature larvae construct pupal chambers in the outer bark at the end of their larval galleries.

The duration of each life stage is correlated to the air temperature. At 26°C, the egg stage lasts 3-5 (average 3.8) d, the larval stage lasts 18-23 (average 21.0) d, the pupal stage lasts 5-7 (average 6.0) d, and the adult stage lasts, 6-43 (average 20.0) d. It takes 40-45 d to finish one generation under field conditions.

The severity of *S. schevyrewi* damage to the elm trees depends on the vigor of the tree. Trees with normal growth do not suffer much damage as they contain few shallow entrance holes and no parental egg galleries, whereas severe damage occurs to declining trees that are weak and more susceptible to invasion. Repeated attacks by *S. schevyrewi* on declining trees lead to tree death.

The developmental rate and survival of *S. schevyrewi* inside the tree trunk is correlated with the physiological condition of the tree. Adult survival is lower, adults lay fewer eggs, and offspring survival is reduced on declining but still live trees due to their encirclement by plant fluids. The ideal location for reproduction is found in recently dead trees with intact bark and no internal sap flow. In such trees, adults can live normally and lay a full complement of eggs under the bark. Larvae can also develop normally to adulthood in recently dead host trees. Such trees are important breeding sites for future generations.

Potential *S. schevyrewi* breeding material consists of woodpiles that are not debarked, high stumps, and dead trees that resulted from other factors such as disease, freezing temperatures, and rodents. Adults that originate from such breeding material have the potential to infest and cause damage to surrounding host trees. The severity of damage to surrounding elm trees is directly affected by the presence of breeding material, the number of sources of suitable breeding material, and the distance between the trees and the sources of breeding material.

Natural Enemies

A species of ecto-parasitic mite is associated with adults. *Cheiropachus* sp. (Hymenoptera: Pteromalidae) and a braconid (Hymenoptera: Braconidae) parasitize larvae, with a combined parasitism of 14.0 to 42.4%.

References

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Translated by Dr. Houping Liu, 208 CIPS Building, Department of Entomology, Michigan State University, East Lansing, MI 48824. E-mail: liuho@pilot.msu.edu; and further modified for readability by Dr. Robert A. Haack, USDA Forest Service, North Central Research Station, 1407 S. Harrison Road, Nisbet Building, Room 220, Michigan State University, East Lansing, Michigan 48823. E-mail rhaack@fs.fed.us.