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Spruce longhorn beetles, genus *Tetropium*, are members of the subfamily Spondylidinae in the family Cerambycidae. Cerambycids are characterized by their long antennae, absence of a beak, and characteristic tarsi. Three species of *Tetropium* are of concern for their potential to cause economic damage due to a wide availability of host trees in North America, and these species have either been found in small populations in North America or intercepted on incoming cargo.

The black spruce longhorn beetle, *Tetropium castaneum* (L.), is found throughout most of Europe, northeastern Asia, China, and Japan. In its native range, this beetle feeds primarily on dead or dying trees, facilitating decomposition. No records have been found of this beetle feeding on live trees. However, a congener, *T. fuscum* (Fabricius) has been reported feeding on healthy trees in North America. Major hosts for *T. castaneum* include trees in the Pineaceae, particularly species of *Picea* and *Abies* but other records include larch (*Larix*) and pine (*Pinus*) species. Walnut (*Juglans*), juniper (*Juniperus*), and oak (*Quercus*) species have been associated with *T. castaneum* in literature, but no records of use as a host plant have been found. Adults of this beetle are 8–20 mm in length with flattened bodies. They are typically shiny dark brown to black. Eggs are laid in dying wood and larvae create large galleries filled with frass and wood dust. Wood-staining fungi in the genus *Ophiostoma* may be associated with larval tunnels and pupal chambers of *Tetropium* spp.

The brown spruce longhorn beetle, *Tetropium fuscum*, is a native of Eurasia that has been introduced into Nova Scotia, Canada. It has a similar biology to *T. castaneum*. In its native range, *T. fuscum* larvae only feed within dead or dying spruce trees. However, in Canada, the infestations were found to be attacking healthy red Spruce (*Picea rubens*). *Tetropium fuscum* primarily infests *Picea* and *Pinus*, but *Abies*, *Larix* and hardwoods are also potential hosts. In North America, *T. fuscum* was reared from *Picea rubens*, *Picea mariana*, *Picea glauca*, and *Picea abies*.

The larch longhorn beetle, *Tetropium gabrieli* Weise, is a common beetle native to central Europe where it feeds on dying and dead larch trees (*Larix*). It has a similar biology to *T. castaneum*. Although this species has not been found in the wild in North America, specimens intercepted at Canadian ports and a single record from New York prompt inclusion here as a potential invasive pest.

Native *Tetropium* are present in the United States and look similar to *T. fuscum*, *T. gabrieli*, and *T. castaneum*. Diagnostic characters are subtle, utilizing comparisons of the punctures present on the pronotum, a groove at the frontal region of the head, and the metatrochanter. These characters may be difficult to distinguish without a microscope. Therefore any suspect cerambycid should be forwarded for professional identification by a trained coleopterist. Basic knowledge of Coleoptera morphology is necessary to screen for *Tetropium* suspects.



Fig. 1: Host damage by larvae of *Tetropium* sp. (Photo by Stanislaw Kinelski, Bugwood.org)



Fig. 2: Larval gallery of *Tetropium* sp. (Photo by Gyorgy Csoka, Hungary Forest Research Institute).

Traps and specimens collected using other means should be sorted initially for the presence of beetles of the appropriate size, color, and shape. Beetles meeting all of the following requirements should be moved to Level 1 Screening (Page 3):

- 1) Beetles measure between 8.0–20.0mm in length (Fig. 3).
- 2) Beetles have an overall shape that is similar to the outline depicted in Fig. 3.
- 3) Beetles are elongate with a laterally rounded pronotum and pubescent elytra (Figs. 4–7).
- 4) Beetles are black to pale reddish brown (Figs. 4–7).

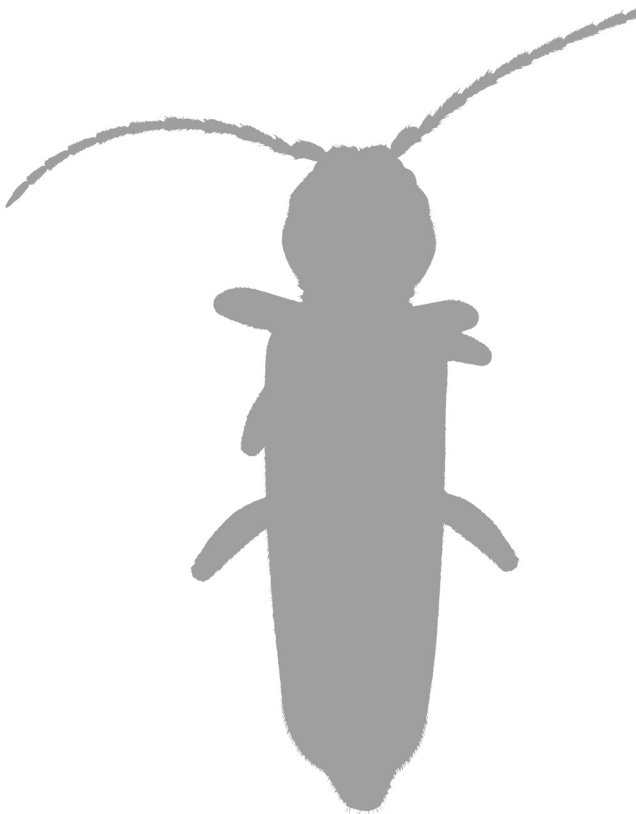


Fig. 3: Outline of an adult *Tetropium* sp.

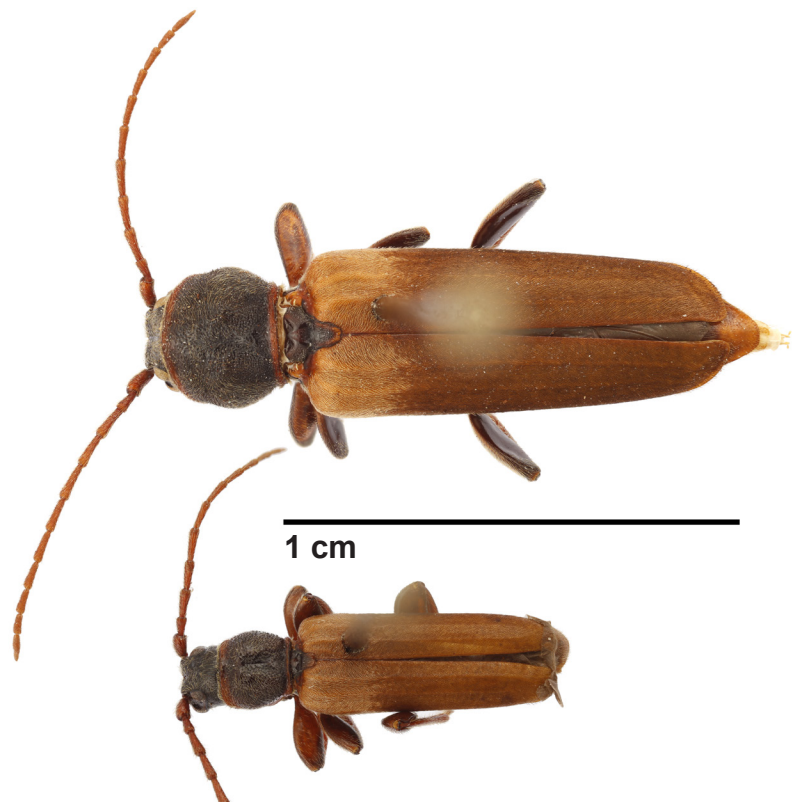


Fig. 4: Female (top) and male (bottom) of *T. fuscum*.



Fig. 5: *Tetropium castaneum*.

Beetles that meet the sorting requirements should be screened for members of the subfamily Spondylidinae. When in doubt distinguishing or evaluating first-level screening characters, forward specimens that have passed the sorting requirements to a trained taxonomist.

Separation to subfamily can be accomplished based on general body shape and the combination of key morphological characters:

- 1) Head inclined anteriorly (Fig. 6).
- 2) Antennae glabrous, with 11 antennomeres (Fig. 7).
- 3) Mandibles long, slender, untoothed, and without fringe of hairs (not shown).
- 4) Tibia with two spurs at the distal end (Fig. 8).
- 5) Tarsi pseudotetramerous with pubescent ventral pads and dilated third tarsomere (Fig 9).



Fig. 6



Fig. 7



Fig. 8

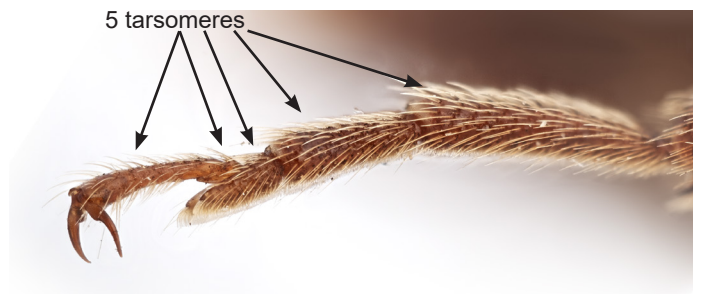


Fig. 9

Most species of *Tetropium* are very similar in appearance. These similarities and variability between specimens can make distinguishing between native and introduced species difficult. The most common North American species are *T. cinnamopterum*, *T. velutinum*, and *T. parvulum*. *Tetropium velutinum* is found in the central western U.S. as well as western Canada north to Alaska, while *T. cinnamopterum* and *T. parvulum* are found throughout the entire coniferous belt of North America. Other species are less common and found on various host plants throughout parts of the U.S. and Canada, but all are similar in appearance and easily be confused with congeners. In addition to other more subtle characters, the wide band of pale pubescence at the bases of the elytra helps distinguish *T. fuscum*, where this band is usually not as distinct, or much narrower in other species.



Fig. 10: *T. castaneum*



Fig. 11: *T. castaneum*



Fig. 12: *T. fuscum* male



Fig. 13: *T. fuscum* female



Fig. 14: *T. abietis*



Fig. 15: *T. abietis*



Fig. 16: *T. parallelum*



Fig. 17: *T. parallelum*





Fig. 18: *T. velutinum*



Fig. 19: *T. velutinum*



Fig. 20: *T. cinnamopterum*



Fig. 21: *T. cinnamopterum*



Fig. 22: *T. parvulum* male



Fig. 23: *T. parvulum* male



Fig. 24: *T. parvulum* female



Fig. 25: *T. parvulum* female



Fig. 26: *T. schwarzianum*



Fig. 27: *T. schwarzianum*



Similarities in general appearance and variability in coloration and size, even within species, makes identification of *Tetropium* species difficult. The diagnostic characters illustrated here are might be challenging to observe for a non-specialist. Any suspect *Tetropium* specimens should be forwarded for identification.

The following primary characters are used for distinguishing between adult species of *Tetropium*:

Pronotal punctures

Species of *Tetropium* are divided into two groups based on the appearance of their pronotal punctures. *Tetropium fuscum*, *T. abietis*, *T. parallelum*, and *T. velutinum*^{*}, possess a asperate pronotum (punctures with elevated edges, giving a rough appearance) on both the sides and dorsal surface of pronotum. The remaining species, *T. gabrieli* (not shown), *T. castaneum*, *T. parvulum*, *T. schwarzianum*, *T. cinnamopterum*, and *T. velutinum*^{*}, lack asperities at least on the anterior half of the pronotum.

^{*}The pronotum of *T. velutinum* is very finely asperate and may be interpreted as belonging to either group.



Fig. 28: *T. fuscum*



Fig. 29: *T. abietis*



Fig. 30: *T. parallelum*



Fig. 31: *T. velutinum*



Fig. 32: *T. castaneum*



Fig. 33: *T. parvulum*



Fig. 34: *T. schwarzianum*



Fig. 35: *T. cinnamopterum*

Frontal groove and/or shape of metatrochanter

Species with asperate pronotum / rough punctures:

T. fuscum: metatrochanter nearly straight, or broadly curved near apical end (Fig. 36).

T. abietis: metatrochanter with blunt rectangular projection in males (Fig. 37) and rounded protuberance in females.

T. parallelum: metatrochanter with strong apical spur in males (Fig. 38) and a small protuberance in females.

T. velutinum: with deep frontal groove (Fig. 31); metatrochanter straight to weakly rounded, lacking any obvious protuberances (Fig. 39).



Fig. 36: *T. fuscum*



Fig. 37: *T. abietis*



Fig. 38: *T. parallelum*



Fig. 39: *T. velutinum*

Species with non-asperate pronotum / smooth punctures:

T. gabrieli: frontal groove weakly furrowed or absent (not shown); metasternum with distinctly less punctures and pubescence in the medial area than the lateral (not shown).

T. castaneum: metatrochanter straight to evenly rounded (Fig. 40) or with a robust angle or spur in males and a smaller protuberance in females (not shown).

T. parvulum: frontal groove deep (Fig. 33); metatrochanter simple, with a rounded or straight edge (Fig. 41).

T. schwarzianum: frontal groove weakly furrowed or absent (Fig. 34); metatrochanter with narrowly angled projection (Fig. 42); metasternum with even punctures and pubescence on the entire surface (not shown).

T. cinnamopterum: frontal groove deep (Fig. 35); metatrochanter simple, with a rounded or straight edge (Fig. 43).



Fig. 40: *T. castaneum*



Fig. 41: *T. parvulum*



Fig. 42: *T. schwarzianum*



Fig. 43: *T. cinnamopterum*

Targets and Non-targets

Spruce longhorn beetles

Tetropium spp.

In addition to the previous characters, host plant and geography may be of help in identifying species of *Tetropium* adults:

Species	Host	North American Range
<i>T. fuscum</i>	Spruce (<i>Picea</i> sp.)	Established in the Maritimes of Canada
<i>T. castaneum</i>	Spruce (<i>Picea</i> sp.) Fir (<i>Abies</i> sp.) Pine (<i>Pinus</i> sp.) Larch (<i>Larix</i> sp.)	Only known from interceptions
<i>T. gabrieli</i>	Larch (<i>Larix</i> sp.)	Only known from interceptions
<i>T. abietis</i>	Fir (<i>Abies</i> sp.)	West of Rocky Mountains, from British Columbia to southern California
<i>T. parallelum</i>	Spruce (<i>Picea</i> sp.)	In Rocky Mountains, from Alberta to Arizona
<i>T. cinnamopterum</i>	Spruce (<i>Picea</i> sp.)	Trans-boreal from Atlantic to Pacific
<i>T. parvulum</i>	Spruce (<i>Picea</i> sp.)	Trans-boreal from Atlantic to Pacific and across southern Canada
<i>T. velutinum</i>	Larch (<i>Larix</i> sp.) Hemlock (<i>Conium</i> sp.) Douglas Fir (<i>Pseudotsuga menziesii</i>)	Western North America
<i>T. schwarzianum</i>	White Pine (<i>Pinus</i> spp.)	Southeastern Canada and northeastern U.S.

Key to Sort and Screen *Tetropium* spp. Suspects in the United States

1. Body between 8.0–20.0mm in length, elongate, with laterally rounded pronotum and pubescent elytra (Figs. 4–5); coloration dark to pale reddish brown (Figs. 4–5)..... **Tetropium suspect**
- 1'. Body shorter or longer than 8.0–20.0mm, not elongate, or with laterally rounded pronotum and pubescent elytra; coloration not dark to pale reddish brown Not *Tetropium*

Citation

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References for more information on *Tetropium* species and non-targets

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