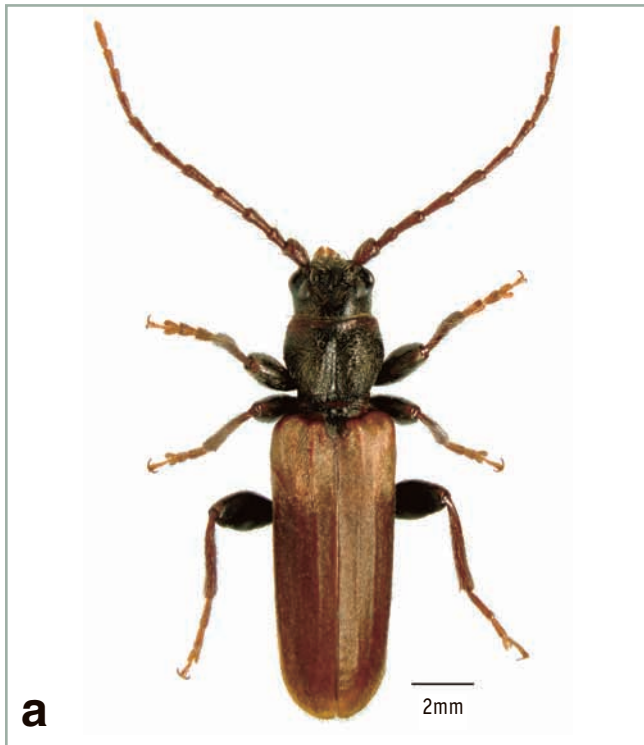




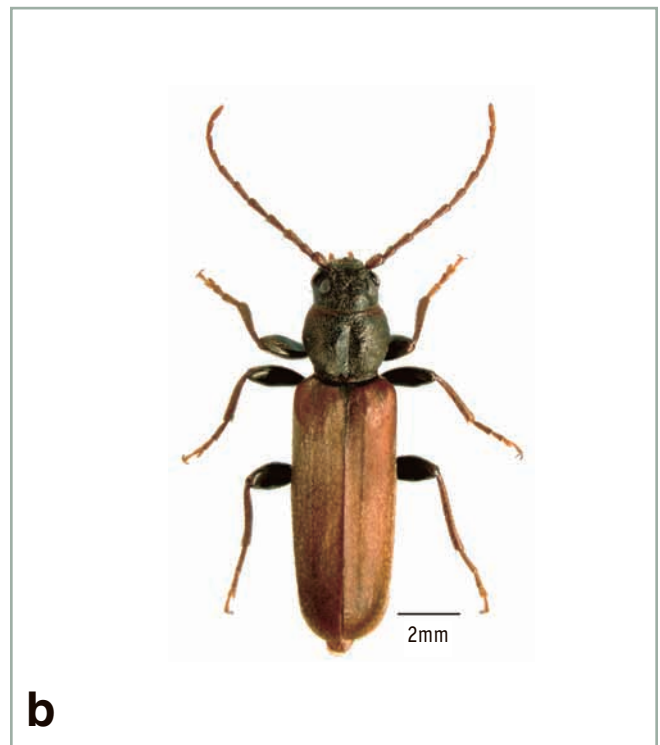
The Brown Spruce Longhorn Beetle

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Klausa Bolle



Klausa Bolle

Figure 1. *Tetropium fuscum* adults: a. male; b. female.

Introduction

The brown spruce longhorn beetle, *Tetropium fuscum* (Fabricius) (Coleoptera: Cerambycidae), is established in and around Point Pleasant Park, a 75-ha heritage park in the Halifax Regional Municipality, Nova Scotia. It has also been intercepted in solid wood packaging at the Canadian ports of Montreal and Vancouver. This woodborer is native to northern and central Europe and western Siberia where it typically attacks dead and dying trees. In Halifax, *T. fuscum* is primarily attacking living, apparently healthy red spruce (*Picea rubens* Sarg.), the predominant spruce of the

Park. Other trees attacked include black spruce (*P. mariana* (Mill.) BSP), white spruce (*P. glauca* (Moench) Voss) and Norway spruce (*P. abies* (L.) Karst).

This is the first established population of *T. fuscum* discovered in North America. The geographic range of the native spruce species attacked in Halifax indicates a potential threat to the predominant tree species of northern coniferous forests. Red spruce is restricted to northeastern North America; however, black and white spruce range across Canada in the boreal forest. It is evident that *T. fuscum* has been present in Nova Scotia



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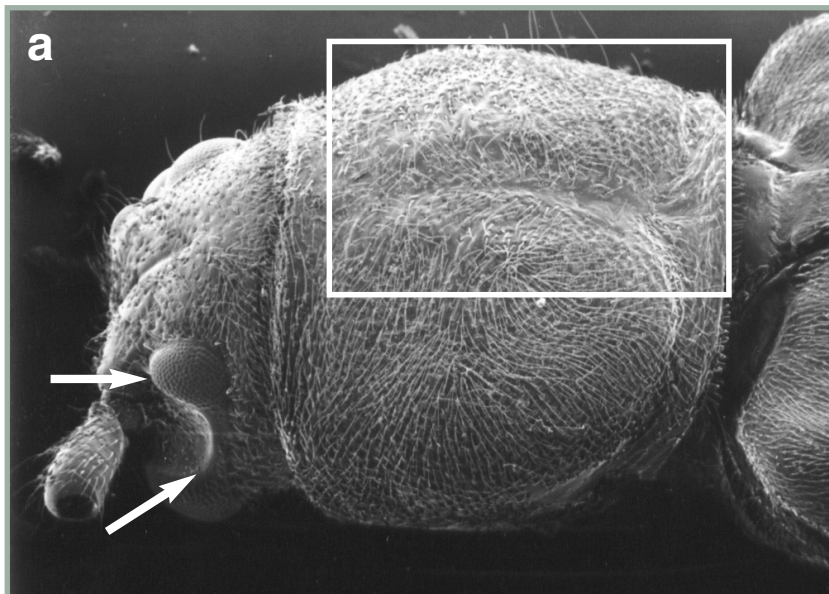
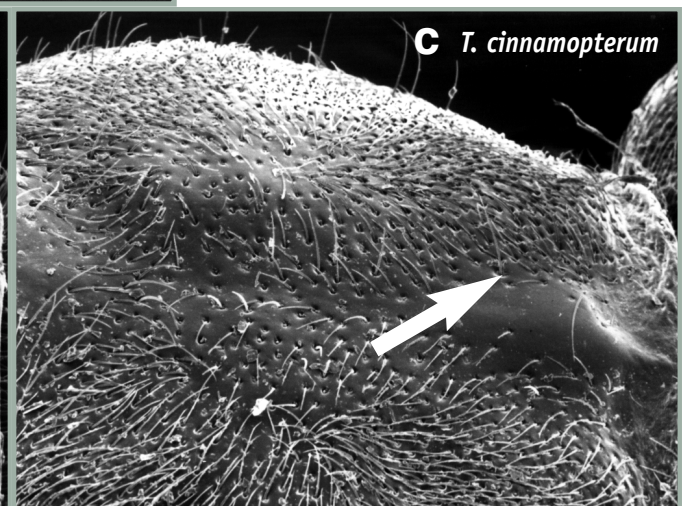
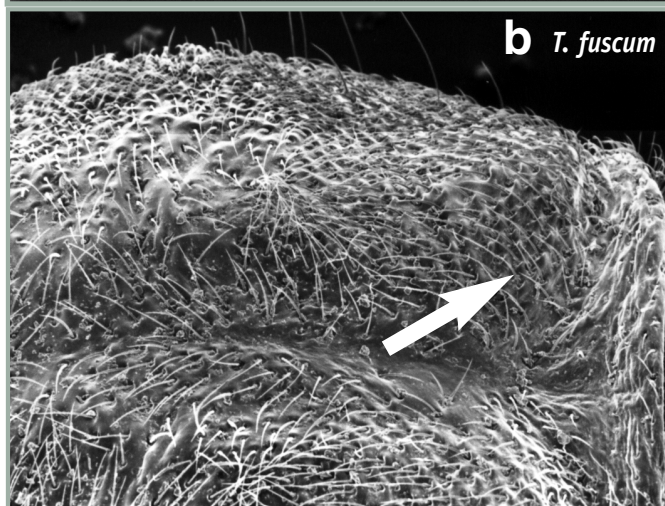


Figure 2.

a. Head and thorax of *T. fuscum* (outline denotes approximate area enlarged in Figs 2b-c). Note divided compound eye (arrows);

b. Upper thorax of *T. fuscum* showing tooth-like projections (arrow);

c. Upper thorax of *T. cinnamopterus*, the most widely distributed North American species. Note absence of tooth-like projections (arrow).



since at least 1990, when it was first collected in the park. As the park is adjacent to a major port, it is believed that imported wood packing material provided the entry pathway for this pest.

Spruce, fir, pine, larch, and occasionally hardwoods are attacked across its native range in Europe and Asia.

The Threat

This insect species is attacking living and apparently healthy spruce trees with green crowns.

All native species of spruce and possibly fir, pine and larch are at risk.

Canada's climate and the widespread distribution of spruces make it susceptible to the establishment of this species.

Hosts

In Nova Scotia, *T. fuscum* is attacking spruces. To date, it is confirmed from red, Norway, white, and black spruce. Each of the North American spruces is a new host association for this pest.

Adult Recognition

Body:

0.8 to 1.8 cm long; compound eyes completely divided into two parts (Fig. 1, 2a); head and thorax are dark brown to black; body is slightly flattened, dark tan, brown, or reddish brown, with a lighter colored band across the shoulder portion of the wing covers visible on some specimens (Fig. 1a). *Tetropium fuscum* (Fig. 2b) can be distinguished from North American species of *Tetropium* (Fig. 2c) by the presence of coarse sculpturing, with tiny, tooth-like projections on the surface of the upper thorax.

Antennae:

red-brown and about half the body length.

Legs:

dark brown in color.

Larval recognition

When fully grown, up to 2.0 cm long; body cream colored to white, with a darker (rust to brown) head; virtually indistinguishable from other *Tetropium* species (Fig. 3).



Figure 3. A *Tetropium* sp. larva

Life Cycle

In its new Canadian environment in Halifax, Nova Scotia, *T. fuscum* can complete its life cycle in one year. It overwinters in the larval stage. During the summer months all four life stages may be present in the host.

Egg:

Usually laid singly or in pairs, are well concealed under bark scales and are securely attached.

Larva:

Feeds initially in the inner, living bark and later scores the sapwood.

At maturity the larva excavates a shallow, oval-shaped pupation chamber in the sapwood or inner bark (Fig. 4).

Pupa:

The larva pupates in the spring after a period of winter dormancy.

Adult:

Adult emergence begins in the spring and continues over a 6-8 week period. Males and females are sexually mature upon emergence and the female has a full complement of eggs (average 80). Mating and host selection begin almost immediately.

Associated Fungus:

A wood staining fungus, *Ophiostoma* sp., is associated with this beetle in Halifax. It is apparent in the pupal chamber (Fig. 5).



Figure 4. Larval galleries in red spruce infested by *T. fuscum*



Figure 5. Fructing bodies of a woodstaining fungus, *Ophiostoma* sp., in a pupal chamber of *T. fuscum*



Figure 6. Resin flow on red spruce infested by *T. fuscum*

Damage

The larvae feed under the bark in the cambium and phloem (living tissue that transports nutrients) and lightly score the sapwood. Much of the tree's cambium can be destroyed by the wide, irregular, meandering feeding tunnels constructed by the larvae. The transport of nutrients is disrupted by larval feeding in the cambium and phloem. Because this species does not appear to favor one side of the tree, the trunk is eventually girdled.

Trees can be re-infested in subsequent years. Although the entire trunk can be attacked, the lower portions appear to be most heavily infested.

Signs: What to look for

- Attacked trees produce excessive resin noticeable down the length of the trunk. (Fig. 6).
- Infested trees may exhibit progressive yellowing, browning, and loss of needles from portions of the crown. After the death of the tree, the remaining foliage turns reddish brown.
- Networks of wide, irregular, meandering feeding tunnels, up to 6 mm across and filled with tightly packed, fine-grained excrement and short wood fibers (Fig. 4).
- Round to oval adult exit holes, averaging 4 mm in diameter, are present on trees infested for more than one year.

Response

The Canadian Food Inspection Agency (CFIA) has identified *T. fuscum* as a pest of plant quarantine significance under the terms of the Plant Protection Act.

In an effort to manage this quarantine pest in Halifax, Nova Scotia, a multi-agency and multi-disciplinary task force was formed in the spring of 2000. The Canadian Forest Service is collaborating closely with the task force to provide scientific support and research information.

Removal of infested spruce trees is ongoing in an attempt to eliminate this pest from North America.

Contacts

For more information, contact any of the following Canadian Forest Service establishments:

| | |
|-------------------------------|----------------|
| Atlantic Forestry Centre - | (506) 452-3500 |
| Laurentian Forestry Centre - | (418) 648-3335 |
| Great Lakes Forestry Centre - | (705) 759-5740 |
| Northern Forestry Centre - | (780) 435-7210 |
| Pacific Forestry Centre - | (250) 363-0600 |

Information on the brown spruce longhorn beetle is available on the Internet at: <http://atl.cfs.nrcan.gc.ca/> (website viewed October 23, 2000)