Pennacchio F., Faggi M., Gatti E., Caronni F., Colombo M., Roversi P.F. - First record of *Phloeotribus liminaris* (Harris) from Europe (Coleoptera Scolytidae).

During surveys conducted in the woods of the Ticino Park in Lombardy, northern Italy, we recorded a North American *Phloeotribus scolytoid*, new to the fauna of Europe, *Phloeotribus liminaris* (Harris), the «Peach Bark Beetle». High densities of wintering refuges and adults were observed on *Prunus serotina* Ehrh., its typical host tree in the natural distribution area. *P. serotina* was introduced into Italy from North America and is now a very diffuse infestant in various lowland woods of northern Italy. This is the first record of the Peach Bark Beetle outside of its natural distribution area where it caused serious damage to *P. serotina*, an important source of valuable wood, and other forest fruit, especially *P. persica*.

The habitat where the bark beetle was found consists of riparian lowland woods dominated by *Prunus* species, especially under sparse coverage, has 

Further confirmation of the problem comes from the recent finding of many *Prunus serotina* Ehrh. (Black Cherry) trees densely colonized by adults of a scolytid coleopteran of the tribe *Phloeotribini* Chapuis in woods of the Ticino Park, northern Italy. The bark beetles were collected during surveys carried out by both DEPFAR and PREVENTO projects. The species was identified as *Phloeotribus liminaris* (Harris) (Peach Bark Beetle) by Pennacchio and Gatti basing on the keys of Wood (1982).

**COLLECTION SITE**

The specimens of *Phloeotribus liminaris*, which belongs to the Nearctic scolytid fauna, were collected on November 25, 2005 in the Ticino River Park (northern Italy) in lowland mixed woods growing along the banks of Ticino at Quintavalle in the municipality of Somma Lombardo (Varese). Those specimens are the first record from Europe of *P. liminaris*.


*P. serotina* was introduced into Italy in the 1920s, near Gallarate (Varese), for experimental trials to provide indications on the quantity and quality of lumber production. The species soon became naturalized and very invasive, altering the composition of the woods along the Ticino River and in other areas of northern Italy. In several residual lowland stands of the Po Valley, the exceptional colonization ability of *P. serotina*, especially under sparse coverage, has compromised the natural regrowth of many native species, also negatively affecting the underbrush flora (Starfinger et al., 2003; Fontaneto et al., 2004).

The plants of Black Cherry colonized by the Peach Bark Beetle consisted of several trees 10-20 cm in diameter and aged 25-45 years.

*Phloeotribus liminaris* (Harris, 1852)


**SPECIMENS EXAMINED** – 23 males and 18 females (coll. on November 25, 2004) in riparian woods on the orographic left bank of the Ticino River at Quintavalle in the municipality of Somma Lombardo (Varese). The material is kept in the entomological collections of the ISZA, Florence, and the Gestione ex ASFD, Belluno.
In order to better identify the species, a brief morphological description is reported.

**MALE** - length 1.9 ± 2.3 mm, 1.9 times as long as wide. Colour more or less dark brown to almost black. Body oval, wide and short (fig. I, 1).

Frons flattened. Epistomal margin with a moderately protruding callus (fig. I, 3). Pubescence sparse, thin and moderately long.

Antennae with very long scape; antennal funiculum with 5 articles, club long, with 3 articles forming a fan; first segment of antennal club three (-four) times as long as wide (fig. I, 4).

Pronotum 0.8 times about as long as wide. Elytrae 1.3÷1.4 times as long as wide and 1.8 times as long as pronotum, rather broadly rounded posteriorly. Basal margin of each elytra with an evident crest of 10-11 granules. Setae of declivity slightly larger than those of elytral disc. Length of each seta 1÷2 times the width of interstria.

**FEMALE** – Very similar to male, but differing from it in frons very weakly convex, lacking both interantennal callus and central impression; in addition, tubercles of elytral declivity slightly but distinctly smaller.

*P. liminaris* is very similar to another Nearctic species, *P. pruni* Wood, from which it can be distinguished by thinner and longer pubescence, by wider and less deeply impressed punctuation of pronotum and by coarser tubercles of second interstria of declivity (usually obsolete in *P. pruni*); the frons of male is also less strongly impressed with wider epistomal callus (Wood, 1982).

*P. liminaris* is also similar in appearance to the European *P. scarabaeoides* (Bernard) (fig. II), from which it differs in the following morphological characters:

- Overall shape more cylindrical, with sides of elytra parallel, whereas the overall shape of *P. scarabaeoides* is more oval (fig. II, 1).
- Antenna with articles of club all shorter and less tapered than in *P. scarabaeoides*, article I of club larger, especially at base; the other two articles are also larger on average with respect to their length. Article I of antennal funiculum approximately as long as wide, very similar to that of *P. scarabaeoides* (fig. II, 4).
- Sides of pronotum completely lacking microgranules, which instead are present in the anterior sector in *P. scarabaeoides* (fig. II, 1 and 2).
- Elytrae covered with very long, erect, intense yellow setae; in *P. scarabaeoides*, elytrae covered with long, dense light-coloured scales and with very thin, erect pubescence (fig. II, 1 and 2).
- Elytral striae as wide as interstriae, with deep and evident punctuation; in *P. scarabaeoides*, elytral striae very narrow, width of interstriae, and with very small punctuation (fig. II, 1 and 2) (Wood, 1982).

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![Fig. 1 – Phloeotribus liminaris (Harris): 1, adult in dorsal view; 2, adult in lateral view; 3, head of male in frontal view; 4, antenna.](image-url)
KEY TO THE ITALIAN SPECIES

1 oval shape, sides of elytra not rectilinear and parallel in the basal two-thirds. Article I of antennal club 7 times longer than wide. Pronotum with evident microgranules in anterolateral sector. Elytra covered with thin, erect pubescence and dense, whitish scales, very close to surface. Elytral striae much narrower than interstriae, with punctuation small and not very evident (length: 1.8-2.5 mm). On Oleaceae.

*P. scarabaeoides* (Bernard)

more cylindrical shape, sides of elytra rectilinear and parallel in basal two-thirds. Article I of antennal club only 3-4 times longer than wide. Pronotum lacking microgranules. Elytra covered only with golden, erect setae. Elytral striae as wide as interstriae, with punctuation broad and very evident (length: 1.9-2.3 mm). On *Prunus* spp.

*P. liminaris* (Harris)

DISTRIBUTION AREA AND HOST PLANTS - The natural distribution area of the Peach Bark Beetle extends from Canada (Manitoba, Quebec, Ontario and New Brunswick) to the eastern United States, as far as the Gulf of Mexico (Connecticut, Delaware, District of Columbia, Florida, Iowa, Kentucky, Maryland, Massachusetts, Michigan, Missouri, New Hampshire, New Jersey, New York, North Carolina, Ohio, Pennsylvania, South Carolina, Virginia, West Virginia and Wisconsin) (Rolving and Kearby, 1975; Bright, 1976; Wood and Bright, 1992; Guthmiller and Hall, 2001; Rabaglia and Valentì, 2003). It is related to the main host, *P. serotina*, and other spontaneous and cultivated *Prunus* species: *P. americana* Marsh., *P. angustifolia* Marsh., *P. persica* (L.).

Host plant preference also distinguishes between *P. liminaris* and the European *P. scarabaeoides*, the latter is related to various species of Oleaceae, such as *Olea europea* L., *Phillyrea* spp., *Praxinus* spp. and *Syringa* spp.

Until now, *P. liminaris* had not been recorded outside of its natural distribution area.

BIOECOLOGY - According to the literature, most adult Peach Bark Beetles overwinter in short, individual galleries dug in the internal bark of host trees in good or deteriorated vegetative conditions (Wood, 1982). These galleries remain within the cortical tissue without reaching the cambium. Some adults spend the winter in breeding galleries in dead trees. As observed in the Ticino Park, the entrance holes of the winter refuges are dug in bark cracks.

In May, the bark beetle emerges from the winter refuges to search for host trees suitable for its reproductive activity. Active adults can be observed until late August. *P. liminaris* is a monogamous species and the digging of breeding galleries is largely carried out by the female (Rexrode, 1982). In the reproductive phase, the bark beetle attacks trees or tree parts weakened and damaged by various causes, in which it digs...
Damage: In North America, *Phloeotribus liminaris* usually causes serious damage to *P. serotina*, whose wood is used in cabinet-making and the production of musical instruments and other valuable articles. The beetle's wintering activity is particularly harmful, as it digs refuges in the vital internal bark of trees in good vegetative condition. When the beetle density is particularly high, the digging activity is evident externally by the abundant accumulation of reddish frass at the base of the tree and between the bark cracks, as well as by the presence of gum from the entrance holes. In subsequent years, the damage to the cambium from the digging activity causes irregular growth of woody tissues and the formation of permanent gum spots incorporated in the wood, which greatly decreases its commercial value (*Rexrode*, 1981; *Rexrode* and *Smith*, 1990). Trees attacked in the wintering phase are almost never killed by the beetles but may be seriously weakened and predisposed to aggression by other phytophages or by the same *P. liminaris* during the reproductive phase.

The fact that the Peach Bark Beetle has been included in the list of insects to be quarantined by the New Zealand National Plant Protection Organisation (2000) (Ministry of Agriculture and Forestry) is further confirmation of its potential harmfulness. In particular, *P. liminaris* is cited in the norms regarding the importation of *P. persica* and *P. persica* var. *nucipersica* (Suckow), and is classified among the «Risk group 1 pests», i.e. «those regulated pests which on introduction into New Zealand could cause unacceptable economic impacts on the production of a commodity/commodities and/or the environment».

In the surveys in the Ticino Park, we recorded high densities of wintering and adult refuges, i.e. between 40 and 80 per dm² of bark, on the trunk and large branches of *P. liminaris* trees. This suggests that the introduction of the Peach Bark Beetle is not recent and that the species is now well adjusted to the Italian climate.

In the reproductive phase, *P. liminaris* usually attacks damaged *P. serotina* trees knocked down or uprooted by the wind, trees weakened by different causes (e.g. intense and repeated defoliation), and material deriving from felling operations, both trunks and residual material of small diameter (*Schultz and Allen*, 1977; *Anonymous*, 2001). The serious damage to *P. serotina* recently recorded in Wisconsin but never observed in the past has even prompted some Authors to consider this a new pest problem (*Anonymous*, 2001; *Guthmiller* and *Hall*, 2001). *P. liminaris* has also been reported as harmful to *P. persica* in the south-eastern United States (*Kovach* and *Gorschuk*, 1985; *Anonymous*, 2001). In U.S., the only known control strategy of this insect pest is based on the traditional silvicultural practices such as the destruction of infested wood (*Regester*, 2004). Semiochemicals of this species are still unknown, pheromonal molecules included. Furthermore, no natural enemies are known from the native areas in having a decisive role in the control of the *P. liminaris* populations.

The possible damage by *P. liminaris* to *P. serotina* does not arouse particular concern, since the tree is considered infestant in all the residual woods of the Po Valley. In contrast, detailed studies on the bioecology and behaviour of the xylophage have been initiated in areas of recent introduction, in view of its potential damage to *Prunus* orchards, particularly the extensive cultivations of *P. persica* in the Po Valley.

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