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The first record of *Pityophthorus micrographus* in Slovakia

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Abstract: In April 2018, the presence of *Pityophthorus micrographus* (Linnaeus, 1758) was recorded at the lumber yard, in the town of Spišská Nová Ves. It was collected from a pheromone trap, lured with ethanol. This is the first record of *P. micrographus* in Slovakia. There is a possibility of its longer presence in Slovakia since it had been confirmed previously in most of the countries neighbouring Slovakia.

Keywords: bark beetle; non-native species; spruce; pheromone trap; lumber yard

Pityophthorus micrographus (Linnaeus, 1758) (Coleoptera: Curculionidae, Scolytinae) originates from the northern parts of Europe and Siberia (Pfeffer 1976; Burakowski *et al.* 1992).

It has a small, cylindrical body (1.6–2.3 mm) (Pfeffer 1976). Its main host is the Siberian spruce (*Picea obovate* Lederbour) (Pfeffer 1976; Beaver *et al.* 2016). It also breeds in the Norway spruce (*Picea abies* L, Karsten), and rarely in other conifers of the Pinaceae family (*Abies* spp., *Larix* spp., *Pinus* spp.) (Burakowski *et al.* 1992; Ericson 2010). It inhabits drying trees of varying age, and breeds in twigs, small branches and upper trunks, preferring well lighted and warm places, high above the ground (Trägårdh 1930; Ehnström & Axelsson 2002) and very rarely descends to the lower parts of the trunks of up to 20 cm in diameter (Mandelshtam *et al.* 2017). Based on the observations of Kangas (1980), it can attack spruces that are physically good, and so it can be an important initiator of the drying process in the spruces that have suffered little from pollution.

According to Maňák (2007), this species is significantly associated with the twigs and branches that remain in the forest after logging, as well as with the dying bottom branches high in the canopy. This was confirmed by another study of the same author (Maňák & Jonsell 2017). The galleries are primarily made in the bark (or the bast), and the larval tunnels are irregular and occur at various depths (Nunberg 1930). The adults of the parent generation occur under the bark from the second 10-day period of May to the first 10-day period of August (Mandelshtam *at al.* 2017). It only has one generation per year, but a sister generation may rarely occur (Burakowski *et al.* 1992).

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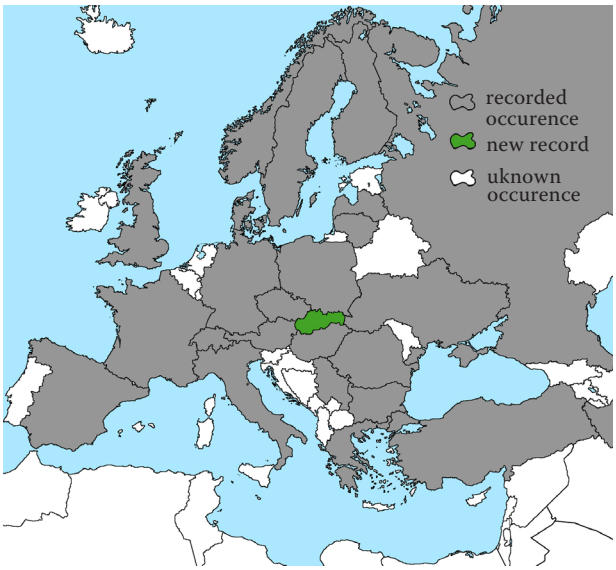

Figure 1. The confirmed occurrence of *Pityophthorus micrographus*, with the new record

Pfeffer (1976) considers it a boreal species with a distribution coincident with that of its main host. It is a native species to Scandinavia (Lekander *et al.* 1977, Martikainen *et al.* 2001), Poland (Karpiński 1934), where it mainly occurs in the northern part of the spruce distribution area (Burakowski *et al.* 1992), and Czechia (Holzschuh 1995). It is common in the east of the Leningrad Province (Mandelshtam *et al.* 2017). This species has a tendency to move into warmer climates from northern areas into warmer climates of southern areas, or from higher to lower elevations on the mountains, in which case, it is possible that it becomes a multivoltine (Pfeffer & Knížek 1989).

Its current area of occurrence has now extended southwards even more; Turkey, Western Siberia and Kazakhstan (Beaver *et al.* 2016), the Ukraine (Nikulina *et al.* 2015) and it has also been recorded in Iran (Samin *et al.* 2011; Beaver *et al.* 2016). Its presence was confirmed also in the southern and western parts of Europe (Zivojinovic 1950; Knížek 2004). Figure 1 shows the recorded occurrence of *P. micrographus* according to the sources mentioned above, and the new record in Slovakia.

MATERIAL AND METHODS

Over the last three years (2016–2018), the monitoring of *Xylosandrus germanus* (Blandford, 1894) was realised (unpublished data). The monitoring was carried out in 55 lumber yards across Slovakia. A pheromone trap (Theysohn trap) lured with ethanol was used. Two ethanol dispensers per trap and season were used (from the end of March to mid-September). The first ethanol dispenser was attached to the trap at the beginning of the season, the second one was added in the middle of the season. The traps were checked at weekly intervals. The collected samples were analysed in the laboratory, and the bark beetles were determined by using the key by Pfeffer (1989, 1995).

RESULTS AND DISCUSSION

During the 3-year-long monitoring of *X. germanus*, more than 1 500 samples from the trap catches were analysed and over 39 thousand bark beetle specimens were determined. Of all the samples, only one specimen of *P. micrographus* was observed. It was caught in Spišská Nová Ves (Figure 2) (48°57'11"N and 20°33'05"E), in the eastern part of Slovakia, on April 19, 2018. The altitude in a 5 km radius is ~440–770 m a.s.l. The surrounding forest area is mainly composed of the Norway spruce (*Picea abies* L., Karst.), the Scots pine (*Pinus sylvestris* Linnaeus.), the European silver fir

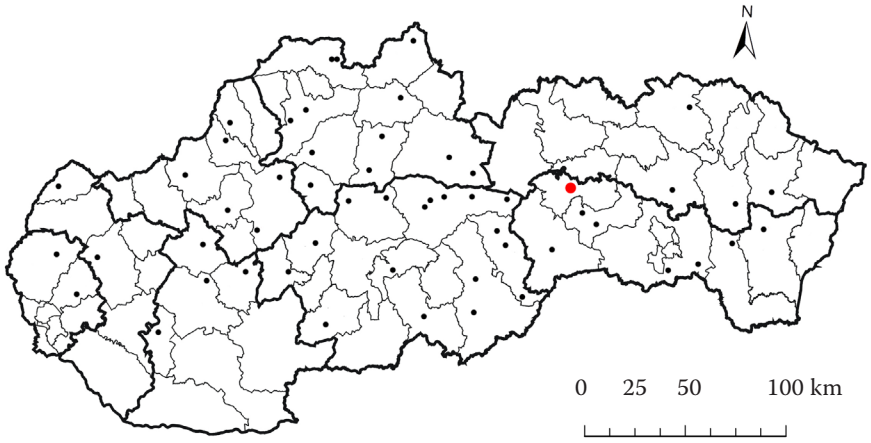

Figure 2. The map of the lumber yards where the monitoring of *Xylosandrus germanus* was executed, with the positive record of *Pityophthorus micrographus*

Black dots – lumber yard: no record 2016–2018; a red dot – new record

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(*Abies alba* Miller) and the European larch (*Larix decidua* Miller). As mentioned, *P. micrographus* can breed in various conifers of the Pinaceae family (Pfeffer 1976; Beaver *et al.* 2016), so we assume that the combination of this species with the other coniferous bark beetles could represent a potential threat in the case of outbreaks.

This is the first confirmed record of *P. micrographus* in Slovakia, although we assume that it has been in Slovakia for a longer period, since its presence in the surrounding countries has been previously confirmed by various authors (Karpiński 1934; Holzschuh 1995; Knížek 2004; Nikulina *et al.* 2015). This could probably be caused by the presence of a similar species, *Pityophthorus pityographus* (Ratzeburg, 1837), which is a common species in Slovakia (Figure 3). Both species mainly develop in thinner material (Trägårdh 1930; Ehnström, Axelsson 2002). The difference between them is well observable in their galleries (Figure 4). While the larval galleries of *P. pityographus* are longitudinal and engraved in the wood surface, the larval galleries of *P. micrographus* run in all directions and are mainly in the bast (Spessivtseff 1929).

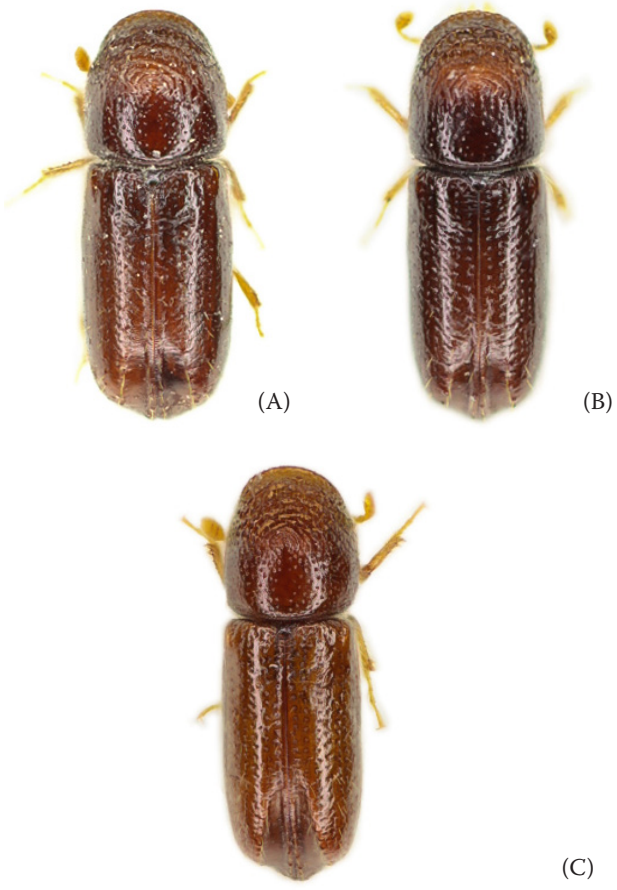

Figure 3. (A) *Pityophthorus micrographus* and the related species, (B) *Pityophthorus pityographus*, and and (C) *Pityophthorus exsculptus*

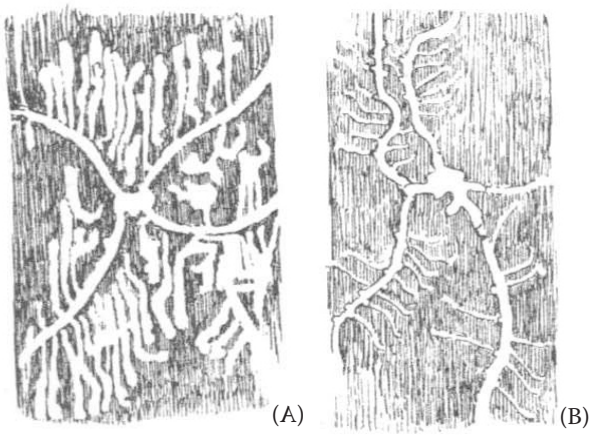

Figure 4. The galleries of (A) *Pityophthorus micrographus* and (B) *Pityophthorus pityographus* (Trägårdh 1930)

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