

The first record of predaceous *Scolothrips longicornis* Priesner 1926 (Thysanoptera: Thripidae) in Slovakia

Prvý nález zoofágnej strapky *Scolothrips longicornis* Priesner 1926 (Thysanoptera: Thripidae) na území Slovenska

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Abstract

This preliminary communication presents the first record of predaceous thrips *Scolothrips longicornis* Priesner, 1926 (Thysanoptera: Thripidae) in Slovakia. As a well known predator of numerous spider mites, e.g. *Tetranychus urticae* or *Eutetranychus orientalis* it has been considered as a suitable biological control agent recently. Tetranychids mites are harmful agriculture pests, causing damage on a variety of greenhouse and field crops (e.g. cucumber, peppers, tomatoes, potatoes, beans, corn, strawberries) and are difficult to control chemically. *Scolothrips longicornis* was recorded in soil and a tree photoeclector samples from Bábsky les wood, a natural oak-hornbeam forest (Fageto – Quercetum), situated in the district of Nitra (SW Slovakia).

Keywords: biocontrol, photoeclector, predator, *Scolothrips longicornis*, Thysanoptera

Abstrakt

Predkladaný článok prináša informáciu o prvom náleze strapky *Scolothrips longicornis* Priesner, 1926 (Thysanoptera, Thripidae) na území Slovenska. Tento druh patrí medzi významné predátory fytopatogénnych roztočov z čeľade Tetranychidae (napr. *Tetranychus urticae*, *Eutetranychus orientalis*) a viaceré nové štúdie naznačujú jeho veľký potenciál pri biologickej kontrole škodcov. Fytopatogénne roztoče z čeľade Tetranychidae patria medzi ekonomicky významné škodce mnohých skleníkových a poľnohospodárskych kultúr. Na Slovensku bol po prvýkrát zaznamenaný prirodzený výskyt druhu *Scolothrips longicornis* v lokalite NPR Bábsky les (JZ Slovensko), ktorá patrí medzi prírodné dúbravy asociácie Fageto – Quercetum.

Kľúčové slová: biologický boj, fotoeklektor, predátor, *Scolothrips longicornis*, Thysanoptera

Introduction

Thrips despite their economic importance have been largely overlooked by many entomologists due to their tiny size which makes their observation, capture and determination difficult and delicate (Palmer et al., 1989; Bournier, 2002). More than 580 thrips species are known from Europe (zur Strassen, 2003) including 180 of them recorded in Slovakia (Fedor et al., 2004; Fedor et al., 2012).

A tenth of all known thrips species live on cultural plants, causing economically important problems (Lewis, 1973). Some of them, e.g. *Thrips palmi* Karny, 1925 are known as quarantine pests. However, there is a small proportion of beneficial thrips preying and feeding on harmful arthropods. A few thrips species therefore can contribute to environmentally safe methods of pest and weed biological control (Lewis, 1973).

Species of the thripid genus *Scolothrips* are well known as predators of mites, such as *Tetranychus urticae* (Gilstrap, 1995; Pakyari et al., 2009), occurring on leaves of various plants (Gilstrap, 1995) and common in bean (Aydemir and Toros, 1990), cucumber and eggplant (Gheibi et al., 1999) fields in Asia. Occasionally the species has been even considered as one of the most abundant predators in farmland (Polat and Kasap 2011; Gonzáles-Zamora et al., 2011). In Europe, it has been recorded on plants infested by mites (zur Strassen, 2003), mostly of the family Tetranychidae (Schliephake et Klimt, 1979), feeding on their eggs. Thus, as “six-spotted thrips” these insects are available as biocontrol agents (Mound, 2011).

Scolothrips longicornis Priesner, 1926 is West-Palaeartic species (zur Strassen 2003), known from many European countries (Sęczkowska, 1971; Pelikán, 1977; Schliephake and Klimt, 1979; Zawirska, 1988; Jenser, 1979, 1992, 1996; zur Strassen, 2003), but it occurs in Middle East and India as well (Priesner, 1950; Gilstrap and Oatman, 1976; Alavi and Kamali, 1996; Hoddle et al., 2004). However, this is the first record from Slovakia.

Material and Methods

The research on thrips presented in this paper was carried out during the 2012 vegetation period. It refers to the area of Bábsky les wood, which is an isolated natural oak-hornbeam forest (*Fageto-Quercetum*), surrounded by farmland and situated in Nitrianska pahorkatina hills (SW Slovakia) (48°18'08'' N, 17°53'25'' E, DFS grid square 7673 c, 213 m a.s.l) (Fig.1).

Thrips were sampled using two photoeclector traps: soil photoeclector (Fig.2), constructed of two collecting jars (Majzlan and Fedor, 2005) and tree photoeclector (Fig.3), based on a principle of positive phototaxis and negative geotropism of insects (Majzlan and Fedor, 2003) and installed on a trunk at the height of 1 m. For both traps ethyleneglycol was used as a conservation liquid. Standard preparatory techniques were applied for mounting thrips (Fedor et al., 2012; Sierka and Fedor, 2004). The material has been deposited in the collections of the authors.

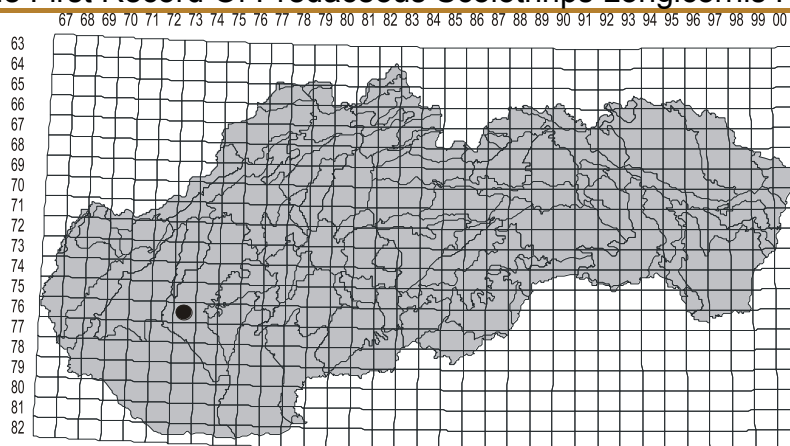


Fig. 1 Study area in the map of the Slovak Republic



Fig.2 Soil photoeclector exposed in the clearing close to the forest (Photo: R. Masarovič)



Fig.3 Tree photoeclector installed in the ecotone (Photo: R. Masarovič)

Results and Discussion

Material examined: SW Slovakia, Nitrianska pahorkatina hills, Bábsky les forest (48°18'08'' N, 17°53'25'' E, DFS grid square 7673 c). May 4, 2012, 1 ♀, captured in the soil photoelector at the clearing. During the whole research period five specimens were captured in soil photoelectors and two in tree photoelectors. All leg. R. Masarovič, det. M. Doričová and R. Masarovič, coll. R. Masarovič. The first record from Slovakia.

Recognition of adult thrips appears easy due to the presence of six (rarely five) pairs of exceptionally long setae on pronotum as well as a similar pair arising between the ocelli (Mound, 2011). Antennae are composed of 8 segments, with first two of them white and the rest segments pale yellow. *Scolothrips longicornis* has 3 dark bands or spots on its fore wings (including clavus). The body colour is white or yellowish white with no dark spots on head and thorax. The total body length of adults varies between 1.140 – 1.380 µm for females and 880 – 1.060 µm for males (Fig 4).

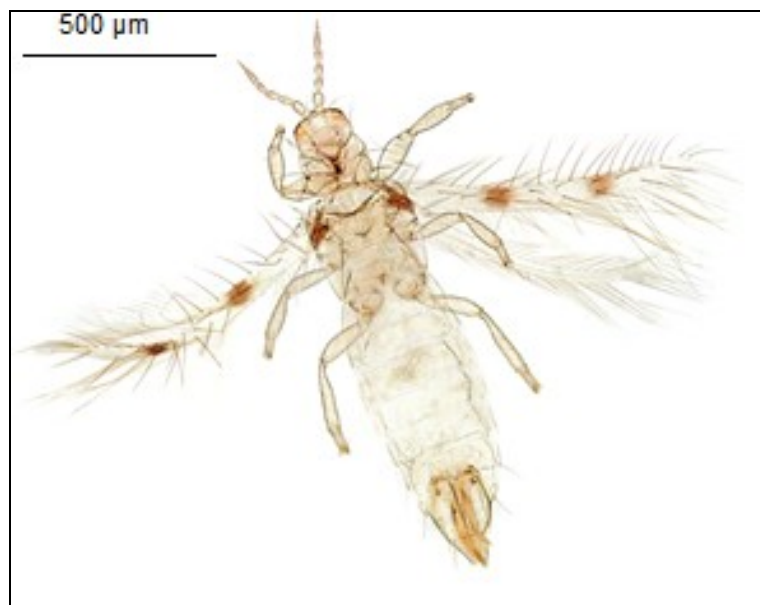


Fig.4 *Scolothrips longicornis* Priesner 1926, ♀ (photo: R. Masarovič)

Potential of *Scolothrips longicornis* for control of tetranychid mites in glasshouses (e. g. Kiliç and Yoldas, 2004) or in open farmland has been much studied (Gerlach 1985; Gerlach and Şengonca, 1985, 1986; Selhorst et al., 1991) since spider mites (Acari: Tetranychidae) are widespread agricultural pests, which often cause severe damage on a variety of annual perennial crops (Gerlach and Sengonca, 1985; Han et al., 2003; Jung, 2005; Jung et al., 2005). Experimental data on the lifetime rates of survival and fecundity for *Scolothrips longicornis* and *Tetranychus cinnabarinus* (Boisduval, 1867) showed that thrips were sometimes able to hold the mite population below the damage threshold, depending on the timing of introduction (Kirk, 1997). *Scolothrips longicornis* density may closely follow mite population and predation has been observed on various mite instars (González-Zamora, et al. 2011). Also, the quantity of food available affects the oviposition rate of predatory thrips. When adult *Scolothrips longicornis* females are provided with more mite eggs per

day, they consume more and their oviposition rate increases (Gerlach, 1985). Thrips are wasteful and often inflict a higher mortality than necessary for feeding. Although some mites are completely sucked out, others are only fed on until they die (Kirk, 1997). The thrips manipulates its prey with its forelegs and pierces it on the dorsal surface, but it is then turned over and fed on from the ventral surface (Gerlach, 1985). If a thrips is distracted by a passing mite, it will abandon the prey it is eating and attack the passing prey, without always returning later to the original one (Kirk, 1997), what means the higher dead mites rate. Nowadays, studies on *Scolothrips longicornis* mainly try to find out what conditions are the best for its highest efficacy against mites. They consider mostly temperature as environmental variable that affects the biocontrol agents. (e. g. Pakyari et al. 2009, 2011; Pakyari and Enkegaard 2012a, 2012b).

Some thrips are well known as useful predators of harmful arthropods. This benefit has been long time overshadowed by their reputation as pests (Kirk, 1997). *Scolothrips longicornis*, belongs to the small proportion of beneficial thrips and may be expected to be good biocontrol agents for mites. More additional studies should be conducted to indicate population size and their impact on potential prey.

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