Hercinothrips femoralis (Reuter, 1891) – **a New Pest Thrips** (Thysanoptera: Panchaetothripinae**) in Slovakia**

Lukáš VARGA

Department of Zoology, Faculty of Natural Sciences, Comenius University, Bratislava, Slovak Republic

Abstract

Varga L. (2008): *Hercinothrips femoralis* (Reuter, 1891) – **a new pest thrips** (Thysanoptera: Panchaetothripinae) **in Slovakia**. Plant Protect Sci., **44**: 114–118.

Monitoring of pest species in plant production and extended trade on ornamental plant material, including precise identification, are the main goals of modern plant protection. As a result, a new species of phytophagous thrips – *Hercinothrips femoralis* (Reuter, 1891) was recorded in Slovakia (experimental greenhouse in Comenius University, Bratislava) in mid 2007. Some plant specimens infested by this pest showed signs of lesions especially on young leaves. The species has been reported in more European countries recently. Due to the potential damage it can cause, increased attention should be paid to pest monitoring.

Keywords: *Hercinothrips femoralis*; greenhouse; ornamental plants; Slovakia

Many thrips (Thysanoptera) are regarded as pests of agricultural or technical crops and ornamental plants. Some of them, e.g. *Thrips palmi* Karny, 1925 and *Frankliniella occidentalis* (Pergande, 1895) are even registered as quarantine pests (EPPO 2006). In addition to direct damage to plant tissues due to feeding, they can also transmit destructive tospoviruses. The importance of thrips monitoring has increased over the last decades due to intensification of international trade on plant material, global traffic and significant climate changes, by which the spread and colonisation of numerous species into new areas has been facilitated. Some pests of local importance have become a serious plague. During this period several costly measures have been implemented to prevent the introduction and establishment of new pest species. Together with an ample, and often complicated, legislative background (Varga 2007), regular monitoring of "hot spot" areas has clearly proved to be an effective method of undesirable organism prevalence control. However, its effectiveness is limited and influenced by various factors.

The fact that the number of recently recorded pest species continues to grow could be due to the increased emphasis placed on recording of well-known pest species and more sensitive means of pest monitoring in latter years.

From the historical point of view, research on thrips in Slovakia and the Czech Republic (or former Czechoslovakia) has a long tradition, although focussed on a few key scientists only. Beginning with Uzel's monograph on thrips from the end of the 19th century (Uzel 1895) and Kratochvíl's

Supported by the Scientific Grant Agency (VEGA) of the Ministry of Education of the Slovak Republic and the Slovak Academy of Sciences, Grant No. 1/4339/07.

comprehensive paper on thrips in cereal fields (Kratochvíl 1939) the most meritous thrips research in Czechoslovakia was carried out by Jaroslav Pelikán. However most of his scientific data on pest species was gathered predominantly from the Czech territory (Pelikán 1977, 1989, 1991, etc.). At the end of the 1990's, a new thysanopterological school was established in Slovakia (Fedor 2003). Based on Pelikán's check-list from 1977, the first list of Slovakian Thysanoptera, comprising 151 thrips species, was published in 2004 (Fedor *et al*. 2003, 2004). Since that time, the number of recorded Thysanoptera in Slovakia has increased significantly (Fedor 2005; Sierka 2005; Fedor & Varga 2007, etc.).

Recent research is focussed on the ecology of thysanopterocoenoses in natural and semi-natural habitats, but also on monitoring of pest species in urban habitats (gardens, glasshouses, etc.). From this point of view, in Slovakia, there has not been any systematic monitoring of thrips. Moreover new methods in thrips identification using artificial neural networks (Fedor *et al*. 2008) have been developed.

MATERIAL AND METHODS

The research on thrips presented in this paper was carried out from February to December 2007, mainly in experimental greenhouses and greenhouses of the Botanical Garden of Comenius University in Bratislava. Specimens were collected regularly, at monthly intervals. A few samples were also obtained from other greenhouses in Bratislava and its surrounding area. A shaking method and individual collecting were used to gather thrips from infested plants. In addition, tree photoeclectors were exposed for a short period (1–2 months) on trunks of some larger woody plants (e.g. *Ficus* spp., *Carica papaya* L.). This approach is suitable for sampling bark-dwelling thrips on exterior surfaces (Fedor *et al*. 2007), but in the interior of greenhouses, it provided only a minimum quantity of material. Specimens were analysed and mounted on slides using standard laboratory methods (Sierka & Fedor, 2004). Nomenclature is in accordance with zur Strassen (2003).

RESULTS AND DISCUSSION

During the investigation period, more phytophagous pest thrips species were identified. *Thrips tabaci* (Lindeman, 1888) was the only thrips species able to overwinter in the external conditions of Central Europe. Another 3 species can survive only in glasshouses or eventually as synanthropic pests on pot flowers in flats and houses. The most abundant species caught on infested ornamental plants was *Frankliniella occidentalis,* a well-known polyphagous thrips with a wide host plant range of more than 200 species (Pelikán 1989). In the first half of 2007 *Gynaikothrips ficorum* (Marchal 1908) was found in samples from the faculty glasshouse. It infested mostly *Ficus* spp. and *Passiflora* sp. and during the second half of the year it slowly disappeared (Fedor & Varga 2007). At the same time, as the population of *G. ficorum* decreased, another thrips species, *Hercinothrips femoralis* (Reuter, 1891), colonised the greenhouse. It is the first official record on the occurrence of this species in Slovakia.

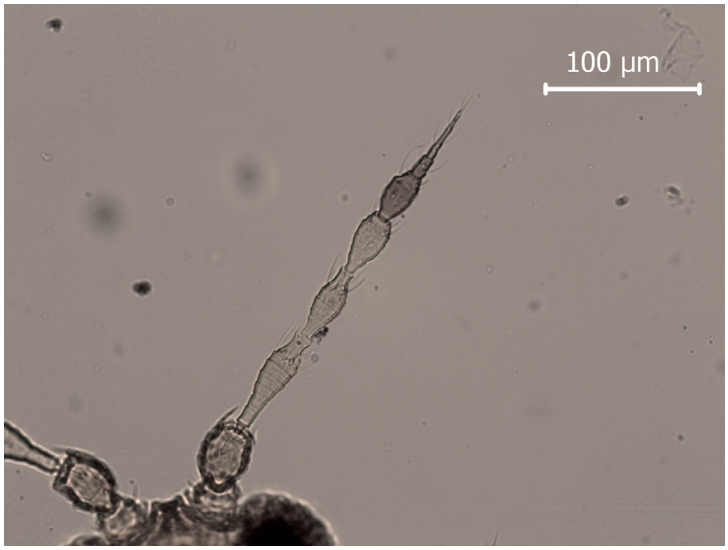

Figure 1. Antennae with typical 8 segments

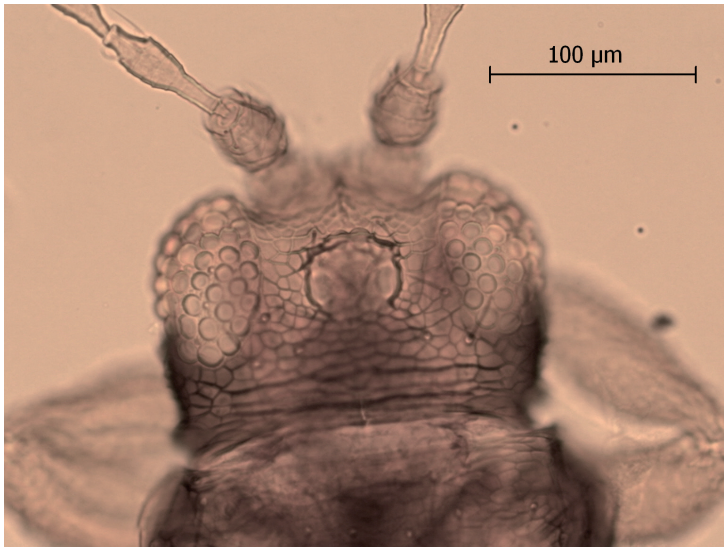

Figure 2. Reticulation of the head is characteristic of Panchaetothripinae

***Hercinorthips femoralis* (Reuter, 1891)**

Material examined. SW Slovakia, Bratislava, Mlynská dolina, in the glasshouse of the Department of Plant Physiology, Faculty of Natural Sciences, Comenius University (48°08'58"N, 17°04'15"E), June 3, 2007, 2 females on *Passiflora* sp., later being recorded more frequently at the same site. All leg. L. Varga, det. P. Fedor and L. Varga, coll. L. Varga. First record from Slovakia.

Distribution. Originally in tropical regions, nowadays pantropic cosmopolitan and a greenhouse inhabitant in temperate areas. Early records in Europe come from Hungary, from the first half of the 20th century (Jenser 1979; Jenser & Czencz 1988). In Europe, records of its recent occurrence have increased: Slovenia (Trdan 2002), Croatia (Šimala & Masten Milek 2007), Crete (Roditakis *et al*. 2006), etc. A similar situation was reported in Australia (Houston *et al*. 1991). Former records from Czechoslovakia (Pelikán 1977) are general, with no specific data for Slovakia, although some data was included in reports by Kratochvíl (1941) from Brno. The research greenhouse in Bratislava was probably infested by transport of new plant material.

Remarks. Systematically, the species belongs to Terebrantia, Thripidae, Panchaetothripinae. The total dark brown body length of adults is usually between 1.1–1.6 mm, with females larger than males. According to zur Strassen (2003), typical characteristics are: eight antennal segments (Figure 1) with forked sense cones on III. and IV., VI. segment coloured dark brown and VIII. long and sharp-ended, reticulation of the head cuticle (Figure 2), two tarsal segments, three transversal dark bands on forewings (Figure 3).

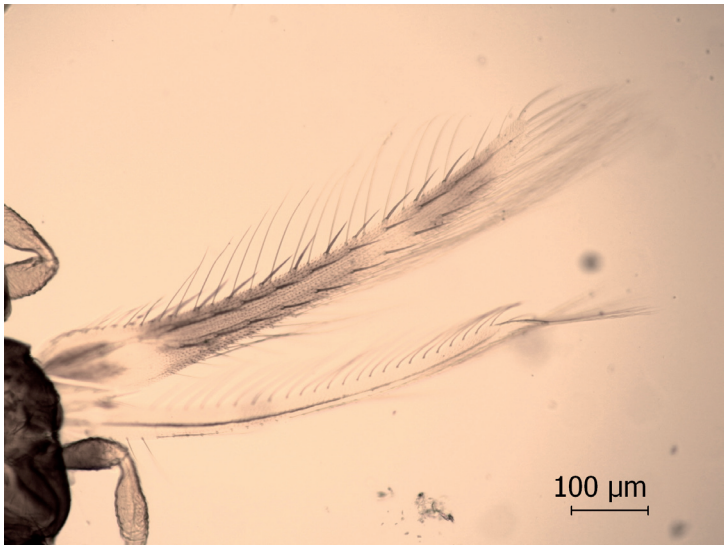

Figure 3. Forewings with 3 transversal dark bands

This species is often called a sugarbeet or banded greenhouse thrips. Foliicolous and polyphagous species feed on a variety of ornamental plants with more than 50 host species known to date (Trdan *et al*. 2007). The developmental cycle, from oviposition to adult, takes 19 days under experimental conditions of 27°C (Laughlin 1971). The species commonly reproduces by thelytokous parthenogenesis. It is an economically important thrips, common on bananas, pineapple, sugar beet, cotton, ground nuts, figs and ornamental plants (Houston *et al*. 1991; Wysoki 1999), however less harmful than better known pest species such as *Thrips palmi*, *T. tabaci* or *Frankliniella occidentalis*. Sucking of both larvae and adults causes tissue damage and silvering. The ability to transmit tospovirus is not known. In our investigation, it infested various plants from different families (*Passiflora* sp., *Chorisia* sp., *Phaseolus vulgaris* L., *Washingtonia* sp.), but the population density was not high and contained only females. Some infested plant specimens showed foliage injury such as deformation and silvering of leaves.

Insecticide resistance of this species is relatively low (Scarpelli & Bosio 1999) and chemical control should be efficient, although environmentally acceptable methods of pest control using natural enemies are promising (Trdan *et al*. 2007). In the Czech Republic, this species is listed in the Catalogue of Alien Animal Species (Šefrová & Laštůvka 2005). Its progressive spread in many countries, and its ability for local infestation of greenhouses should warrant attention, especially in the commercial production of ornamental plants.

Collecting integrated data for research, education and practical agriculture is essential for the coordination of scientific, economic and legislative pest control. For this purpose a national database of economically important Thysanoptera will be prepared.

Acknowledgements. My thanks to Dr. Peter J. Fedor for his support and critical review of the manuscript. Gratitude should be also addressed to Prof. Ján Hudák the head of Department of Plant Physiology and the staff of Botanical garden at Comenius University, Bratislava.

References

EPPO Standards (2006): EPPO A1 and A2 Lists of pests recommended for regulation as quarantine pests. European and Mediterranean Plant Protection Organization, Paris, France.

Fedor P.J. (2003): Bibliografický prehľad thysanopterologických prác so zreteľom na územie Slovenska. Entomofauna Carpathica, **15**: 68–70.

Fedor P.J. (2005): First records of *Melanthrips acetosellae* (Thysanoptera, Aelothripidae) in Slovakia. Biologia, **60**: 177–178.

Fedor P.J., Varga L. (2007): The first record of *Gynaikothrips ficorum* Marchal, 1908 (Thysanoptera) in Slovakia. Thysanopteron Pismo Entomologiczne, **3** (1): 1–2.

Fedor P.J., Sierka W., Majzlan O. (2003): Strapky (Thysanoptera) Slovenska – prvý národný check-list. Folia Faunistica Slovaca, **8**: 57–59.

Fedor P.J., Sierka W., Majzlan O. (2004): The thrips (Thysanoptera) of Slovakia. Acta Phytopathologica et Entomologica Hungarica, **39**: 301–309.

Fedor P.J., Dubovský M., Majzlan O. (2007): Tree Photoeclector in sampling bark-dwelling thrips (Thysanoptera). Thysanopteron Pismo Entomologiczne, **3** (1): 14–16.

Fedor P., Malenovský I., Vaňhara J., Sierka W., Havel J. (2008): Thrips (Thysanoptera) identification using artificial neural networks. Bulletin of Entomological Research, **98**: 437–467.

Houston K.J., Mound L.A., Palmer J.M. (1991): Two pest thrips (Thysanoptera) new to Australia, with notes on the distribution and structural variation of other species. Journal of the Australian Entomological Society, **30**: 231–232.

Jenser G. (1979): A check-list of Thysanoptera of Hungary. Folia Entomologica Hungarica, **32** (2): 31–42.

Jenser G., Czenz K. (1988): Thysanoptera species occurring frequently on cultivated plants in Hungary. Acta Phytopathologica et Entomologica Hungarica, **23**: 285–289.

Kratochvíl J. (1939): K poznání třásněnek žijících na ovesných kulturách a příčiny bělení, šupinatění a hluchosti ovesných klásků a lat. Entomologické listy, **2**: 87–105.

Kratochvíl J. (1941): Třásněnky brněnských skleníků a škody, které působí na skleníkových rostlinách. Ochrana rostlin, **17**: 51–59.

Laughlin R. (1971): A culture method for *Hercinothrips femoralis* (Reuter) (Thysanoptera). Journal of the Australian Entomological Society, **10**: 301–303.

Pelikán J. (1977): Thysanoptera. In: Dlabola J. (ed.): Check list – Enumeratio insectorum bohemoslovakiae. Acta faunistica entomologica Musei Nationalis Pragae, **15** (Suppl. 4): 55–59.

Pelikán J. (1989): Nově importovaný škůdce skleníkových rostlin, třásněnka západní, *Frankliniella occidentalis* (Pergande, 1895). Ochrana rostlin, **25**: 271–278.

Pelikán J. (1991): Truběnka fíkusová (*Gynaikothrips ficorum* Marchal, 1908) ve sklenících v Československu. Ochrana rostlin, **27**: 287–291.

Roditakis E., Mound L.A., Roditakis N.E. (2006): First record in Crete of *Hercinothrips femoralis* in greenhouse banana plantations. Phytoparasitica, **34**: 488–490.

Scarpelli F., Bosio G. (1999): *Echinothrips americanus* Morgan, nuovo tisanottero delle serre. L'Informatore Agrario, LV, **2**: 59–61.

Sierka W. (2005): First records of three thrips species (Thysanoptera, Thripidae, Thripinae) from soutwestern Slovakia. Biologia, **60**: 111–112.

Sierka W., Fedor P.J. (2004): Wciornastki (Insecta, Thysanoptera). University of Silesia, Katowice.

Šefrová H., Laštůvka Z. (2005): Catalogue of Alien Animal Species in the Czech Republic. Acta Universitatis Agriculturae et Silviculturae Mendeleianae Brunensis, **3**: 151–170.

Šimala M., Masten Milek T. (2007): Thysanoptera species recorded in greenhouses in Croatia through period 2003–2006. In: Trdan S. (ed.): Book of Abstracts 2nd Symposium on Paleartic Thysanoptera, 18–20 September 2007, Strunjan, Slovenia, Ljubljana: Biotechnical Faculty, Department of Agronomy: 24–25.

Trdan S. (2002): *Hercinothrips femoralis* (Reuter) also recorded in Slovenia. Sodobno Kmetijstvo, **35**: 242–244 (in Slovenian).

Trdan S., Kužnik L., Vidrih, M. (2007): First results concerning the efficacy of entomopathogenic nematodes against *Hercinothrips femoralis* (Reuter). Acta Agriculturae Slovenica, **89** (1): 5–13.

Uzel B. (1895): Monographie der Ordnung Thysanoptera. Königgrätz.

Varga L. (2007): Legislative aspects in monitoring of thrips (Thysanoptera) in Slovakia. Thysanopteron Pismo Entomologiczne, **3** (1): 3–8.

Wysoki M. (1999): Thysanoptera in Israel. In: 16th Conference of the Entomological Society of Israel. Phytoparasitica, **27**: 73–74.

zur Strassen R. (2003): Die terebranten Thysanopteren Europas und des Mittelmeer-Gebietes. Goecke & Evers, Keltern.

Received for publication June 10, 2008
Accepted after corrections July 30, 2008

Corresponding author:

Lukáš Varga, M.Sc., Univerzita Komenského, Prírodovedecká fakulta, Katedra zoológie, Mlynská dolina, pavilón B-1, 842 15 Bratislava 4, Slovenská republika
tel.: + 421 907 500 826, e-mail: varga.lukas@gmail.com