

# First Interception of the Greenhouse Pest *Echinothrips americanus* Morgan, 1913 (Thysanoptera: Thripidae) in Slovak Republic

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## Abstract

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*Echinothrips americanus* Morgan, 1913, is one of the pest species that expanded their area of distribution in a relatively short time. Being native to the eastern parts of North America, its first European interception was recorded in 1989. Since then it has invaded greenhouses in most European countries, including Slovakia, where it was first recorded in inspected material at the Botanical garden in Košice. As a polyphagous thrips with a wide host range it may induce damage mainly on ornamentals, although if low in numbers it can be easily overlooked. The species is a suitable example where preventive steps against its spread have not been sufficient enough which, therefore, demands further monitoring. Remarks on morphology, identification, economical importance and control are also given.

**Keywords:** *Echinothrips americanus*; thrips; ornamentals; spread; greenhouse; pest

For the last decades a considerable number of alien pest species has appeared and been established in Europe. In many European countries some of the economically important thrips were recorded only recently for the first time (RODITAKIS *et al.* 2006; VIERBERGEN *et al.* 2006; FEDOR & VARGA 2007). Species originating in tropical and subtropical regions are capable to spread into mild climate areas via man-made habitats. Thus, in conditions of Central and Northern Europe, the preferred habitats of colonisation are mostly greenhouses or occasionally even the interiors of human dwellings, which provide a potential for expansion by active or passive migration. One of these alien species is *Echinothrips americanus* Morgan, 1913 (Thy-

sanoptera: Thripidae), whose records in Slovakia are described in this contribution.

In Europe, *E. americanus* was recorded for the first time at Syon Butterfly House (Brentford, UK) in February 1989 (COLLINS 1998). In 1993 it was introduced to the Netherlands with cuttings of *Syngonium* originating in the USA (VIERBERGEN 1998).

## MATERIAL AND METHODS

The presented data originate in research on thrips in greenhouses and the urban ecosystems with cultivated plants carried out between February 2007 and July 2008 as part of the official moni-

toring of *Thrips palmi* Karny, 1925, and *Frankliniella occidentalis* (Pergande 1895) in Slovakia. Samples of thrips were acquired from various locations throughout Slovakia in cooperation with the Central Controlling and Testing Institute in Agriculture (UKSUP), Bratislava. The specimens were gathered from infested plants using common sampling methods and preserved in AGA solution (alcohol-glycerin-acetic acid). For identification they were mounted on slides according to standard laboratory methods (MOUND & KIBBY 1998; FEDOR & SIERKA 2004).

## RESULTS AND DISCUSSION

In early June 2008 three samples were received from greenhouses of the University Botanical garden in Košice (48°44'04"N, 21°14'17"E). Two of them, collected on May 22, 2008, contained specimens of *Echinothrips americanus*, which was at the same time the first official record for Slovakia. Altogether 15 ♀♀ were identified; one specimen originated from *Pachystachis* sp. where it occurred together with *Frankliniella occidentalis*, the other 14 specimens were collected on other "diverse ornamental plants". All leg. L. Pytel, det. L. Varga et P. Fedor. The material has been stored in the collection of the first author. The damage on infested plants was recorded in the report as spots of discoloration on leaves, a typical symptom caused by sucking of thrips larvae and adults. In these greenhouses the thrips showed to be extremely polyphagous, being found on about 90 ornamental plant species from 44 families (Suvák, personal communication). Additional investigation proved that this species had been observed for the first time about 1–2 years ago in the same glasshouses on *Acalypha hispida* (Brum. f., 1768) (Euphorbiaceae). At that time it aroused attention due to heavy damage on leaves that later dropped off. Using older identification keys, the thrips was preliminarily identified by the staff of the botanical garden as a probable member of the genus *Echinothrips*, without further research and its occurrence has remained unpublished.

Another, and the most recent interception was made in the Comenius University glasshouse, Bratislava (48°08'58"N, 17°04'15"E), June 3, 2008, where 7 ♀♀ were captured on newly imported specimens of water hyacinth (*Eichhornia crassipes* (Mart.) Solms, 1883) intended for experimental work in plant physiology. All leg., det. et coll. L. Varga.

*Echinothrips americanus* taxonomically belongs to Terebrantia, Thripidae, Thripinae. Females are about 1.3–1.6 mm and males 1.1–1.3 mm long. Adults are dark brown to black with reddish subintegumental pigmentation between abdominal segments. The integument of head, pronotum and metanotum has a distinct reticulate sculpturing (Figure 1). Antennae are composed of eight segments, with segments I and II dark brown, III, IV and the proximal half of V lighter and the rest of the antennae moderate brown. Segments III and IV have simple sense cones, segment VI is longer than both VII and VIII together. The basal part of the femora, distal half of tibiae and whole tarsi are yellow. Forewings are coloured gray-brown, with about the basal sixth white. Abdomen with characteristic medial pair of relatively long setae on tergites, subreticulate sculpture with conspicuous microtrichia across lateral quarters of tergites I–VII, complete posteromarginal comb on abdominal segment VIII. Larvae and pupae are whitish to yellow. Despite strong reticulation of head and thorax, *Echinothrips* is placed in subfamily Thripinae. It differs from subfamily Panchaetothripinae in that the costa and first vein are clearly segregated and the mesothoracic furca



Figure 1. Characteristic reticulation of head and pronotum (*E. americanus*)

has a well developed spinula. In comparison to the quite common Panchaethripinae in European greenhouses *Hercinothrips femoralis* (Reuter, 1981) and *Parthenothrips dracena* (Heeger, 1854) (which has only seven antennal segments) it has relatively short antennal segments VII and VIII and lacks the reticulate sculpture on legs. Information on the genetics of the species are given by TRDAN *et al.* (2003).

The duration of the life cycle depends on temperature. At 20°C it took 33.9 d, at 30°C only about one third of the time (11.4 days). Experimentally, *E. americanus* can tolerate a few hours of 0°C or even temperatures below –10°C in the later stages of development, but cannot survive them for extended periods (OETTING & BESHEAR 1993).

*Echinothrips americanus* is the only representative of the genus found in Europe. Originally it is a Nearctic species with native distribution area involving eastern parts of North America extending from Florida to New York and Iowa, where it lives preferably on forest weeds (VIERBERGEN 1998). Distribution and spread in Europe till 2005 (VIERBERGEN *et al.* 2006) included 15 European countries. In the same year the species was recorded also from Russia (IZHEVSKIY & MIRONOVA 2008). Interceptions from countries neighbouring with Slovakia were made in 1998 (Czech Republic), 2000 (Austria), 2004 (Hungary) (VIERBERGEN *et al.* 2006) and 2000 in Poland (ŁABANOWSKI 2007). Its rapid spread indicates that *E. americanus* is a successful opportunist, easily overlooked during import inspection, due to insignificant signs of damage. Although data on its occurrence in the open in Europe are sparse, VIERBERGEN (2002) supposes that this polyphagous species does not readily settle outside glasshouses. It is expected to have a cosmopolitan distribution in the near future. Risk assessment by EPPO showed this thrips had been dispersed too far throughout the EPPO-area and with little damage potential to retain its quarantine status (VIERBERGEN *et al.* 2006); it was thus deleted from the EPPO Alert List in 2000. As a foliicolous species it has a preference for the lower leaf surface. When in higher abundance, it can usually be easily detected due to the color contrast between its body and plant tissue. The species does not participate in tospovirus transmission and plant injury is caused primarily by direct mechanical damage due to sucking which may resemble symptoms caused by phytophagous mites. The lesions appear in most cases as light

spots or silvering of leaves, thereby reducing the aesthetic features of ornamentals. About 50 host plant species have been reported within cultivated plants (OETTING *et al.* 1993; VIERBERGEN 1998), but further research on host plant range would be appropriate with respect to data stated in this paper. The species is regarded to be sensitive to insecticides commonly used against thrips (OETTING *et al.* 1993; SCARPELLI & BOSIO 1999), being in general relatively easy to control in this manner. Effective means of biological control are still under investigation to arrive at a more environmentally friendly approach in horticulture.

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