

Composite thrips, *Microcephalothrips abdominalis*, a new alien species for Bulgarian fauna

ALEXANDUR POPOV, KATIA TRENCHVA*, GEORGI TRENCHEV

Department of Plant Protection, Faculty of Agronomy, University of Forestry, Sofia, Bulgaria

*Corresponding author: k_trencheva@yahoo.com

Citation: Popov A., Trencheva K., Trenchev G. (2020): Composite thrips, *Microcephalothrips abdominalis*, a new alien species for Bulgarian fauna. Plant Protect. Sci., 56: 132–134.

Abstract: *Microcephalothrips abdominalis* (Crawford, 1910) (Thysanoptera: Thripidae) has been reported as a new alien species for Bulgarian fauna. The composite thrips were recorded during complex research on Thysanoptera diversity in the southwestern part of Bulgaria, with a special emphasis on the locality of the Petrich region. The thrips specimens, especially the adult females were collected on the 18th of May 2004, but the material was slide-mounted and identified in 2019. The species was found on *Calendula officinalis* Linnaeus only and has since become established outdoors. *M. abdominalis* could be a potential threat for this region of Bulgaria, especially in glasshouses with an ability to transmit economically important viruses such as Tobacco Streak Virus (TSV).

Keywords: Thysanoptera; Bulgaria; alien thrips

Thrips are major invasive insects (Morse & Hoddle 2006; Pizzol et al. 2014). Many thrips species are known as economic pests, causing extensive crop damage by feeding on leaf tissue or by vectoring viral diseases. According to Reynaud (2010), in Europe, seven thrips species are known vectors of viruses including five alien species: three species of *Frankliniella*, one species of *Thrips* and *Microcephalothrips abdominalis* (Crawford, 1910). Of the 6 200 thrips species worldwide, fifty-two alien species, belonging to four families have been recorded within Europe (Reynaud 2010; Ng & Zaimi 2018). Thrips have been introduced to new continents and have spread through various pathways such as the plant trade and the accidental transport of adults and pre-imaginal stages. This was made easy by the fact that they are small, able to rapidly generate large populations and by their inconspicuous behaviour like thigmotaxis and egg insertion inside plant tissues (Reynaud 2010; Pizzol et al. 2017). Their effective control may be a real problem, due to the lack of natural enemies in the new habitats. Currently, a total of 155 thrips species are known to occur in the territory of

Bulgaria, seven of them with alien origin, belonging to two families Aeolothripidae and Thripidae (Tomov et al. 2009; Karadjova & Krumov 2015). *M. abdominalis* is the eighth alien thrips species reported in Bulgaria, after *Franklinothrips megalops* (Trybom, 1912), *Echinothrips americanus* (Morgan, 1913), *Frankliniella occidentalis* (Pergande, 1895), *Heliothrips haemorrhoidalis* (Bouché, 1833), *Parthenothrips dracaenae* (Heeger, 1854), *Pseudodendrothrips mori* (Niwa, 1908) and *Thrips simplex* (Morrison, 1930) (Tomov et al. 2009). The composite thrips were recorded from the Afrotropical region, the Australian region, the Canary Islands, Croatia, the French mainland, Hungary, the Italian mainland, the Near East, the Nearctic region, the Neotropical region, North Africa, the oriental region, Slovenia and the Slovak Republic (Fedor et al. 2018; Fauna Europea 2019). This is the eighth record of composite thrips in Europe. This note reports *M. abdominalis* (Crawford, 1910) (Thysanoptera: Thripidae) as a new species for the Bulgarian fauna and a new pest, which has the potential to transmit plant viruses, such as the Tobacco streak virus (TSV) in the country.

<https://doi.org/10.17221/94/2019-PPS>

MATERIAL AND METHODS

The thrips specimens were collected outdoors, individually, using pincers and a brush as well as by shaking the flowers of *Calendula officinalis* Linnaeus (Asteraceae). The specimens were preserved in small vials containing 96% ethyl alcohol and glycerine, until identified. In the laboratory, the specimens were mounted on microscope slides in Canada balsam using a form of the protocol given by Mound and Marullo (1996) and identified using the keys and illustrations of Mound and Kibby (1998). The observations were recorded with a digital camera. The permanent slides have been deposited at the University of Forestry, Plant Protection Department, Laboratory of Entomology, Sofia, Bulgaria. The nomenclature used here for the Thysanoptera is given according to Fauna Europea (2019).

RESULTS AND DISCUSSION

M. abdominalis, one of the relatively new alien species in Europe, was first described in 1910 by Crawford in Mexico as *Thrips abdominalis* (Pizzol et al. 2012). The composite thrips were observed in Europe for the first time in 1994 in Italy (Jenser 2013). In Croatia, the species was detected in 2001 (Trdan 2002). Later in 2004, the species was observed in Slovenia and Hungary (Vierbergen et al. 2006). It was recorded in France and Slovakia in 2008 and 2016, respectively (Pizzol et al. 2012; Fedor et al. 2018). The species was also recorded in Canary Islands (Zur Strassen 2003). In Bulgaria, the composite thrips were collected for the first time in 2004, but the material was slide-mounted and identified, 15 years later in 2019. The species was recorded during complex research on Thysanoptera in the southwestern part of Bulgaria, with a special emphasis on the locality of the Petrich region. The thrip specimens, especially adult females were collected on the 18th of May in the village Rupite, located near to the town of Petrich. The species was found, on *Calendula officinalis* Linnaeus only and has since become established outdoors. *M. abdominalis* could be a potential threat for this region of Bulgaria, especially in glasshouses, with the ability to transmit economically important viruses such as TSV from *Ageratum houstonianum* Miller (Asteraceae) to tobacco (*Nicotiana tabacum* Linnaeus) or cucumber (*Cucumis sativus* Linnaeus) during feeding (Fedor et al. 2018). The species probably entered Bulgaria with ornamental plants.

Although the species is known to attack various plants from Asteraceae, including many ornamentals such as *Bidens*, *Chrysanthemum*, *Helianthus*, *Pyrethrum*, *Tagetes*, *Zinnia* (Pizzol et al. 2012), in Bulgaria, the composite thrips were collected from the flowers of *Calendula officinalis* Linnaeus only. According to Pizzol et al. (2012), across the wide area of distribution known for this species, reports of damage are infrequent, but the greatest attention should be paid to its potential as a virus vector. Its rapid spreading over the last few years in several European countries, most probably due to the climate changes and plant trade suggests the potential for it to become a pest. A detailed morphological description of the composite thrips is given in the publications of Pizzol et al. (2012) and Fedor et al. (2018). The body length varies from 1080 to 1320 µm (females). They had 7-segmented antennae, a head with only 2 pairs of ocellar setae, the paired ctenidia were present on the tergites V–VIII, the females were brown (Zur Strassen 2003) (Figures 1 to 4).

Further research on the *M. abdominalis* distributed in Bulgaria is required to evaluate its biology, ecology, spreading rate, habitats and effective control.



Figure 1. An adult *M. abdominalis*



Figure 2. The 7-segmented antenna of the *M. abdominalis*

<https://doi.org/10.17221/94/2019-PPS>

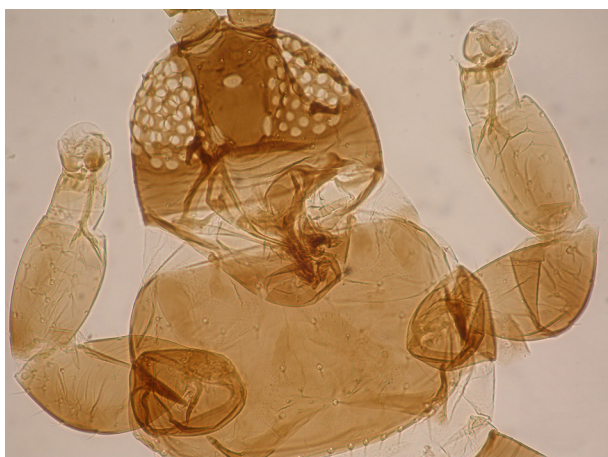


Figure 3. The head with the ocellar triangle and pronotum of the *M. abdominalis*

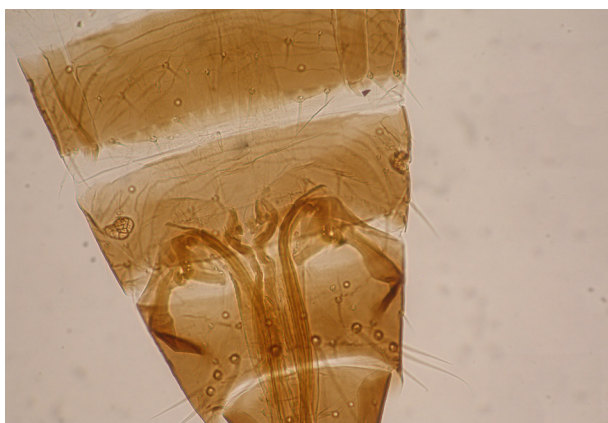


Figure 4. Sternites VI and VII of the *M. abdominalis*

REFERENCES

- Fedor P., Sigmund J., Zvaríková M., Masarovič R., Štefánik M., Krumpál M., Litavský J., Prokop P. (2018): The most northern record of the alien composite thrips *Microcephalothrips abdominalis* in Europe – short communication. *Plant Protection Science*, 54: 43–47.
- Fauna Europaea (2019): Available at <http://www.fauna-eu.org>
- Jenser G. (2013): Faunistical and ecological observations on Thysanoptera II. *Folia Entomologica Hungarica*, 74: 5–12.
- Karadjova O., Krumov V. (2015): Thysanoptera of Bulgaria. *ZooKeys*, 504: 93–131.
- Mound A., Marullo R. (1996): The thrips of central and south America: An introduction (Insecta: Thysanoptera). *Memoirs on Entomology International*, 6: 1–488.
- Mound L., Kibby G. (1998): *Thysanoptera: An Identification Guide*. 2nd Ed. London, CAB International Institute of Entomology and British Museum (Natural History).
- Morse M., Hoddle M. (2006): Invasion biology of thrips. *Annual Review of Entomology*, 51: 67–89.
- Ng Y.F., Zaimi J.S. (2018): The economically important thrips from Malaysia, with a key to species (Thysanoptera, Thripinae). *ZooKeys*, 810: 113–126.
- Pizzol J., Desneux N., Poncet C., Reynaud P. (2012): *Microcephalothrips abdominalis* (Thysanoptera: Thripidae) discovered in Southern France. *Acta Horticulturae (ISHS)*, 952: 785–792.
- Pizzol J., Nammour D., Rabasse J., Parolin P., Desneux N., Poncet C., Reynaud P. (2014): Species and population dynamics of thrips occurring inside and outside greenhouses cultivated with roses in southern France. *International Journal of Agricultural Policy and Research*, 2: 141–153.
- Pizzol J., Reynaud P., Bresch C., Rabasse J., Biondi A., Desneux N., Parolin P., Poncet C. (2017): Diversity of Thysanoptera species and associated host plants in Southern France. *Journal of Mediterranean Ecology*, 15: 13–27.
- Reynaud P. (2010): Thrips (Thysanoptera). Chapter 13.1. In: Roques A., Kenis M., Lees D., Lopez-Vaamonde C., Rabitsch W., Rasplus J.-Y., Roy D.B. (eds): *Alien terrestrial arthropods of Europe*. *BioRisk*, 4(2): 767–791.
- Trdan S. (2002): After the first record of *Microcephalothrips abdominalis* (Crawford) in Slovenia: presentation of the species and evaluation of its potential economic importance. *Zbornik Biotehniške Fakultete Univerze v Ljubljani Kmetijstvo*, 79: 309–316.
- Tomov R., Trencheva K., Trenchev G., Cota E., Ramadhi A., Ivanov B., Naceski S., Papazova-Anakieva I., Kenis M. (2009): Non-indigenous insects and their threat to biodiversity and economy in Albania, Bulgaria and Republic of Macedonia. Pensoft Publishers, Sofia-Moscow.
- Vierbergen G., Cean M., Szeller H., Jenser G., Masten T., Šimala M. (2006): Spread of two thrips pests in Europe: *Echinothrips americanus* and *Microcephalothrips abdominalis* (Thysanoptera: Thripidae). *Acta Phytopathologica et Entomologica Hungarica*, 41: 287–296.
- Zur Strassen R. (2003): Die terebranten Thysanopteren Europas und des Mittelmeergebietes. *Die Tierwelt Deutschlands*. Keltern, Goecke and Evers.

Received: August 28, 2019

Accepted: December 16, 2019

Published online: February 17, 2020