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Short Article 3



First report of the exotic banded greenhouse thrips, *Hercinothrips femoralis* (Reuter, 1891) (Thysanoptera: Thripidae) in Iran

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ABSTRACT. The banded greenhouse thrips, *Hercinothrips femoralis* (Reuter, 1891), is newly recorded from Iran. This is also considered the first record of the genus *Hercinothrips* Bagnall for the country. This record increases the number of Iranian members of the subfamily Panchaetothripinae to nine species in eight genera. The thrips was collected from bell pepper, *Capsicum annuum* L. (Solanaceae), in a greenhouse in Tehran, Tehran province, in February 2025. A taxonomic diagnosis is provided to facilitate its identification.

KEYWORDS: Capsicum annuum, Greenhouse, Panchaetothripinae, Sugar beet thrips

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INTRODUCTION

Thrips (Thysanoptera) are minute insects and one of the most damaging and challenging crop pests worldwide (Jandricic et al. 2024). They are common insect pests that most planters have difficulty to control them due to their small size and ability to remain hidden in flower buds. Several species are known as greenhouse pests, of which banded greenhouse thrips, *Hercinothrips femoralis* (Reuter, 1891), is common in temperate greenhouses (Mound et al. 1976; Goldaracena & Vierbergen 2022). This species, which was originally described from Finland in northern Europe (Reuter 1891), has a cosmopolitan distribution (Roditakis et al. 2006; Masarovič et al. 2014). *Hercinothrips femoralis*, commonly referred to as the banded greenhouse thrips or sugar beet thrips, is a polyphagous species that feeds on the leaves of over 50 plant species, e.g., figs (*Ficus* spp.), sugar beet, ground nuts, banana, cotton, sugar cane, pineapple, and ornamentals (Oetting & Beshear 1980; Houston et al. 1991; Trdan et al. 2007).

Here, *H. femoralis* is newly recorded from Iran. It is also the first record on the occurrence of the genus *Hercinothrips* for the country.

MATERIAL AND METHODS

In middle February 2025, in the research greenhouse of the Biological Control Research Department, the second author's workplace, a thrips species was found to be active on cultivated bell peppers, *Capsicum annuum* L. (Solanaceae) (Fig. 1). Collected specimens were studied using a stereomicroscope Zeiss[®] Stemi SV8 and Olympus[®] CH-2 compound microscope. Slide-mounted specimens were photographed using an Olympus[®] BH-2 compound microscope equipped with a Canon[®] EOS 650D

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digital camera, and then retouched where necessary using Adobe Photoshop CS4 Version 11.0. Voucher specimens are deposited in Hayk Mirzayans Insect Museum (HMIM), Iranian Research Institute of Plant Protection (IRIPP), Tehran, Iran.

RESULTS

Taxonomic hierarchy

Class Insecta Linnaeus, 1758

Order Thysanoptera Haliday, 1836

Suborder Terebrantia Haliday, 1836

Family Thripidae Stevens, 1829

Subfamily Panchaetothripinae, Bagnall, 1912

Genus Hercinothrips Bagnall, 1932

Hercinothrips Bagnall, 1932:506. Type species: Heliothrips bicinctus Bagnall, 1919, by original designation.

The genus *Hercinothrips* is characterised by having two-segmented tarsi; an almost complete row of setae on both veins of the fore-wing; stout venal setae, with usually the same length as the median width of the fore-wing; two-segmented maxillary palpi; and antennal segments III and IV with forked sense cones (Mound 1965).

Hercinothrips femoralis (Reuter, 1891)

Heliothrips femoralis Reuter, 1891:166.

(Figs 2, 3)

Material examined. 26 99 (HMIM), Iran, Tehran province, Tehran, Daneshjou Blvd., Biological Control Research Department, IRIPP, 35°48'1.84"N, 51°23'49.63"E, 14.II.2025, greenhouse, leg. S.H. Malkeshi; 24 99 (HMIM), 17.III.2025, leg. S. Manzari, other data the same as previous.



Figure 1. Infested pots of bell peppers with Hercinothrips femoralis (Reuter, 1891) in the greenhouse.

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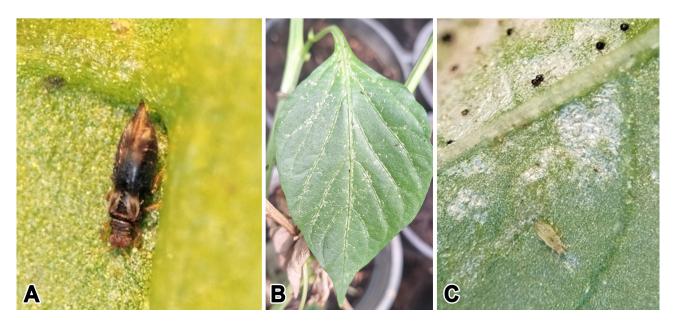


Figure 2. *Hercinothrips femoralis* (Reuter, 1891) in the greenhouse. **A.** An adult female; **B.** Adults on the infested leaf surface; **C.** Larvae on the back of a leaf.

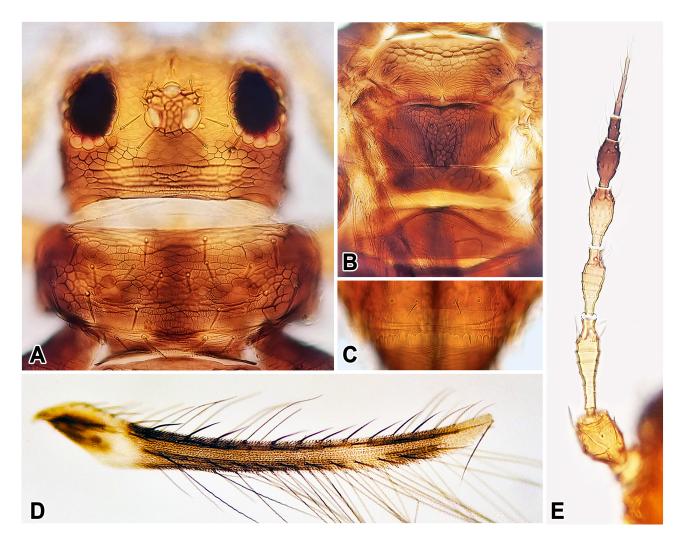


Figure 3. *Hercinothrips femoralis* (Reuter, 1891), female. **A.** Head and pronotum; **B.** Meso- and metanotum; **C.** Abdominal tergite VIII; **D.** Fore-wing; **E.** Antenna.

Diagnostic characters. Female macroptera. Body brown to dark brown; head and pronotum with yellow markings, posterior half of head brown, at least laterally (Fig. 3A); metanotum median setae arise medially, one pair of campaniform sensilla present (Fig. 3B); legs yellow, mid and hind femora brown; antennae 8-segmented, segments VI–VIII brown, segment VIII sharp-ended (Fig. 3E); fore-wing mainly brown, pale at apex and sub-basally, and with submedian area variably lighter indicating three transversal dark bands, posteromarginal cilia wavy (Fig. 3D); abdominal tergite VIII with comb of a few microtrichia laterally (comb incomplete) (Fig. 3C), tergite X with longitudinal split almost complete.

Comments. The banded greenhouse thrips is very similar to *Hercinothrips bicinctus* (Bagnall), but the latter species has the fore-wing with an extensive pale area medially between two darker bands.

Distribution. Africa: Kenya, Nigeria, Sierra Leone, Tanzania, Uganda; North, Central and South America (Goldaracena & Vierbergen 2022); Guadeloupe and Martinique (Etienne et al. 2015); Iberian Peninsula (Lacasa & Martínez 1988); Asia: Japan (Houston et al. 1991), Korea (Houston et al. 1991; Lee & Lee 2016), China (Wang et al. 2022), Iran (current study); Australia and New Zealand (Houston et al. 1991); Europe: Slovakia (Varga 2008), Greece (Roditakis et al. 2006), Slovenia (Trdan 2002), Hungary (Jenser & Czencz 1988), Croatia (Simala & Milek 2008).

DISCUSSION

The subfamily Panchaetothripinae currently includes 150 species in 42 genera, and all its species are leaf-feeders (ThripsWiki 2025). Close to the end of 2008, it included six species in five genera in Iran, viz. Caliothrips Daniel, Heliothrips Haliday, Parthenothrips Uzel, Retithrips Marchal, and Rhipiphorothrips Morgan (Bhatti et al. 2009). Two more genera, Selenothrips Karny and Phibalothrips Hood, were then reported by Mirab-balou & Chen (2012) and Minaei & Afsharizadeh Bami (2018), respectively, bringing the members of the subfamily to eight species in seven genera. Based on the current study, the subfamily includes nine species belonging to eight genera in Iran. The genus Hercinothrips can be distinguished from these seven genera by the following combination of characters: (1) antennae 8segmented (7-segmented in Parthenothrips and Phibalothrips), (2) antennal segments III and IV with forked sense cones (simple sense cones in Heliothrips, Parthenothrips, Phibalothrips and Rhipiphorothrips (in the only Iranian species, Rhipiphorothrips cruentatus, Hood)), (3) tarsi two-segmented (one-segmented in Caliothrips, Heliothrips, Parthenothrips (mid and hind tarsi), Phibalothrips, Retithrips (mid and hind tarsi), Rhipiphorothrips and Selenothrips)), which is unusual amongst Panchaetothripinae. In Iran, another Panchaetothripinae species, Heliothrips haemorrhoidalis (Bouché), also occurs in greenhouses. This species, which is commonly known as the greenhouse thrips, can be easily separated from *H. femoralis* by uniformly pale fore-wing (mainly brown in H. femoralis (Fig. 3D)), with posterior margin and veinal fork shaded or weakly shaded, and legs being entirely yellow to whitish yellow (Fig. 4) (mid and hind femora brown in H. femoralis), in addition to what mentioned above about these two genera.

Although greenhouses offer an opportunity to produce large quantities of high-quality products on a relatively small surface area, but such artificial environments with their specific conditions may produce new possibilities for polyphagous and opportunist pest species, like H. femoralis, to establish in the new environments. The genus Hercinothrips currently includes 10 extant species and one fossil species known from Baltic amber. The former 10 species, including H. femoralis, are presumably African in origin (Mound et al. 1976; Goldaracena & Vierbergen 2022; Wang et al. 2022). The latter species is currently considered a pantropical and cosmopolitan species inhabiting greenhouses in temperate areas (Varga 2008). This exotic species is a potential pest of ornamental plants and greenhouse crops (Roditakis et al. 2006; Trdan et al. 2007). The harm caused to some ornamental crops, such as Aspidistra elatior (Asparagaceae) and Arum italicum (Araceae), has been reported (Lacasa & Martínez 1988). Severe damage to banana fruits caused by H. femoralis is typically associated with smoky-red discoloration and may occasionally include skin cracking (Masarovič et al. 2014). Hercinothrips femoralis is an economically significant thrips; however, it is considered less damaging than well-known pest species such as Thrips palmi Karny, T. tabaci Lindeman, or Frankliniella occidentalis (Pergande) (Varga 2008). Feeding by both larvae and adults results in tissue damage and leaf silvering, as well as causing the appearance of small black specks on the undersides of leaves (Fig. 2B-C).

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Figure 4. Heliothrips haemorrhoidalis (Bouché). A. Female habitus; B. Adult on an infested leaf.

The introduction pathway of *H. femoralis* into Iran is presently unclear. This is particularly noteworthy, since this pest has not been reported from any of Iran's neighboring countries, excluding the doubtful record of its occurrence in Turkey (Tunç & Hastenpflug-Vesmanis 2016). But the passive transport by humans or through the importation of plant materials such as ornamental plants can be considered as the most possible eventuality. Thrips are generally weak flyers, and their poor membranous wings and small body size make them unable to pass long distances by their own activity (Lewis 1997; Masarovič et al. 2014). Štefánik et al. (2019) showed that the unintentional human-assisted dispersal pathway plays a crucial role in the dispersal of *H. femoralis*.

AUTHOR'S CONTRIBUTION

The authors confirm their contribution in the paper as follows: S. Manzari: Identifying the specimens, collecting the second part of the specimens, preparing the photograph of the mounted specimens, writing the manuscript and correspondence; S.H. Malkeshi: Collecting the first part of the specimens and preparing the photographs in the greenhouse. All authors read and approved the final version of the manuscript.

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AVAILABILITY OF DATA AND MATERIAL

The specimens listed in this study are deposited in Hayk Mirzayans Insect Museum (HMIM), Iranian Research Institute of Plant Protection, Tehran, Iran, and are available from the curator upon request.

ETHICS APPROVAL AND CONSENT TO PARTICIPATE

This study only included plants and arthropod material, and all required ethical guidelines for the treatment and use of animals were strictly adhered to in accordance with international, national, and institutional regulations. No human participants were involved in any studies conducted by the authors for this article.

CONSENT FOR PUBLICATION

Not applicable.

CONFLICT OF INTERESTS

The authors declare that there is no conflict of interest regarding the publication of this paper.

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اولین گزارش از تریپس غیربومی (Reuter, 1891) (Reuter اولین گزارش از تریپس غیربومی (Thripidae) (Thripidae

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ویراستار علمی جلیل علوی

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ا**نتشار:** ۰۱ دی ۱۴۰۴

چکیده: تریپس (Reuter, 1891) Hercinothrips femoralis (Reuter, 1891) برای اولینبار از ایران گزارش می شود. همچنین، این اولین گزارش جنس Hercinothrips Bagnall برای کشور محسوب می شود. این گزارش تعداد اعضای زیرخانواده Panchaetothripinae در ایران را به نُه گونه در هشت جنس افزایش می دهد. این تریپس در بهمن ماه ۱۴۰۳ از گلخانهای در تهران، از روی فلفل دلمه ای (Solanaceae)، جمع آوری شد. خصوصیات تشخیصی برای تسهیل شناسایی این تریپس ارایه شد.

واژگان کلیدی: فلفل دلمهای، ترییس چغندرقند، گلخانه، Panchaetothripinae