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**WING POLYMORPHISM OF *RHIPIDOTHrips BRUNNEUS* WILLIAMS,
1913 (THYSANOPTERA: AEOLOTHRIPIDAE) //**

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Summary. One of the small genera of the family Aeolothripidae (Thysanoptera: Terebrantia) *Rhipidothrips* Uzel includes 6 species. Up to now, 4 species of this genus have been recorded in Iran. The wingless morph of *R. brunneus* Williams is described for the first time based on specimens collected from pasture plants in Javanrud County, Kermanshah Province (western Iran). A key to Iranian species of *Rhipidothrips* is also provided.

Key words: Aeolothripidae, *Rhipidothrips*, morph, description, identification, Iran.

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Резюме. Один из небольших родов семейства Aeolothripidae (Thysanoptera: Terebrantia) *Rhipidothrips* Uzel включает 6 видов. До настоящего времени 4 вида этого рода были зарегистрированы в Иране. Впервые описана бескрылая морфа *R. brunneus* Williams на основе экземпляров, собранных на пастбищных растениях в округе Джаванруд, провинция Керманшах (запад Ирана). Также приводится определительная таблица иранских видов *Rhipidothrips*.

INTRODUCTION

Aeolothripidae with 220 extant species in 23 genera worldwide is one of the families of the order Thysanoptera (ThripsWiki, 2023). Members of this family are recognized by their fore wings which are broad with the apex rounded and usually with black and white transverse bands, the antennae usually are 9-segmented; segments III-V are elongate and parallel-sided, and the sensoria on antennal segments III and IV are flat, linear or oval shaped, and the ovipositor is upturned (Nakahara, 1991). The genus *Rhipidothrips* Uzel, 1895 includes six species in the world (ThripsWiki, 2023), of them four species recorded from Iran (Mirab-balou, 2018).

Amongst Iranian aeolothripids, the following characters easily distinguish the genus *Rhipidothrips*: antennae 9-segmented, with one sense cone on each antennal segments III and IV, and antennal segments VII to IX fused; pronotum with a pair of elongate posteroangular setae; and fore wing completely transparent (Mirab-balou & Chen, 2012). However, members of this genus are macropterous, but microptery is also available in *R. brunneus* Williams populations.

Recently, several thrips specimens were collected on rangeland plants in Javanrud city, Kermanshah Province, Iran. Different morphs of *R. brunneus* i.e. micropterous and macropterous were collected and apterous morph was also found and is described here.

MATERIAL AND METHODS

Specimens were collected on rangeland plants from Javanrud city, Kermanshah province, and prepared onto slides using the method of Mirab-balou & Chen (2010). The specimens are deposited in the collection of Department of Plant Protection, College of Agriculture, Ilam University, Iran (ILAMU).

RESULTS

Order Thysanoptera

Family Aeolothripidae

Genus *Rhipidothrips* Uzel, 1895

Remarks. Up to the present, four *Rhipidothrips* species have been recorded from Iran (Mirab-balou, 2018): *R. unicolor* zur Strassen reported from Canary Islands and Iran (Khuzestan province), *R. flavus* Tunç from Türkiye and Iran (Golestan and Hamedan provinces), *R. graciosus* Uzel from Southern areas of the western Palaearctic, California, Türkiye and Iran (Azarbaijan-e-Sharghi, Fars, Kerman, Golestan, Hamedan provinces), and worldwide *R. brunneus* Williams.

Key to Iranian species of *Rhipidothrips* Uzel

1. Antennal segment II yellow 2
- Antennal segment II brown 3
2. Body brown, head and antennal segment I and end of abdomen dark brown, pronotum light yellow or yellow with a brown stain in the middle, often spotted abdomen *R. graciosus* Uzel, 1895
- Body light yellow, pronotum and tergites with small, brown spots; antennal segment I white or pale yellow *R. flavus* Tunç, 1991
3. Apex of mid and hind tibiae, mostly of for tibiae and base of mid and hind femora yellow, internal body color often carmine red; females macropterous, micropterous or apterous *R. brunneus* Williams, 1913
- Legs completely brown, internal body color orange brown; females macropterous *R. unicolor* zur Strassen, 1965

Rhipidothrips brunneus Williams, 1913

Figs 1–6

MATERIAL EXAMINED. Iran: Kermanshah province, Javanrud, on rangeland plants, 28.VI 2023, 3♀, leg. Arezoo Moradi.

DIAGNOSIS. FEMALE (f. apterous) Body, legs and antennae largely brown; tarsi, apex of mid and hind tibiae, mostly of for tibiae and base of mid and hind femora yellow (Fig. 1); antennal segments I-II brown, apex of II yellow, III-IV yellow (Fig. 4). Head. Antennae 9-segmented, segments VII-IX fused, segments III and IV with transverse sense cone at apex.

Head with less than five pairs of small ante-ocular setae; more than 6 thick setae on cheeks, behind compound eyes. Thorax. Pronotum with one pair of long posteroangular setae and 2 pairs of posteromarginal setae. Mesonotum without microtrichia on sculpture lines. Metanotum with elongate reticulations, without microtrichia, median setae near at posterior margin. Fore tarsus with strongly recurved denticle. Abdomen. Abdominal tergites with transverse reticulation, trichobothria on last segment about as large as major setal bases. Abdominal sternites III-VI with 2 or 3 pairs of posteromarginal setae; sternite VII with 4 pairs of posteromarginal setae, 2 pairs of supernumerary setae, 3 discal setae laterally. Ovipositor well developed.

FEMALE (f. *microptera*) (Fig. 2). Similar to apterous morph, with wings lobe shorter than thorax (Fig. 5).

FEMALE (f. *macroptera*) (Fig. 3). Fore wing pale with posterior margin weakly shaded, with cross veins visible (Fig. 6).

MALE. Abdominal tergite I with paired longitudinal ridges scarcely one third as long as tergite.



Figs 1–6. *Rhipidothrips brunneus*, female: 1 – f. aptera; 2 – f. microptera; 3 – f. macroptera; 4 – antenna; 5 – fore wing lobe of micropterous form; 6 – fore wing of macropterous form.

REMARKS. Wings may be present or absent in thrips species; and the wings when present are unique among insects because they are narrow, with few or no veins, fringed with long hairs that hence give the order's name. Recently, we collected many thrips specimens on rangeland plants and one of them, *R. brunneus* was dominant. After the identification of specimens, the wingless form of this species is described for the first time. Because of extensive collecting in both spring and summer, it seems likely that both morphs of the species occur only at the end of spring and early in summer.

DISTRIBUTION. Iran (Golestan, Khuzestan, Hamedan, Azarbaijan-e-Sharghi, Kermanshah, Ilam), China, widespread across Western Europe to Egypt, also Western Australia and USA (California) (Mirab-balou, 2018).

DISCUSSION

Among Thysanoptera, there are three different wing morphs: aptera (wingless), microptera (short-winged), and macroptera (fully winged). Among Terebrantian species, the ecological function of wing reduction is less obvious, despite being widespread in males. Amongst Aeolothripidae, the species with wingless or micropterous adults are usually those that live at ground level and exhibit some level of ant-mimicry, such as *Aeolothrips albicinctus* Haliday, *Aeolothrips bicolor* Hinds, and *Desmothrips reedi* Mound (Tyagi *et al.*, 2008). In Iran, among aeolothripids, most of species are fully winged, and a few are short-winged such as *A. albicinctus*. *Rhipidothrips* species are mostly macropterous (Alavi & Minaei, 2018), and only a micropterous form was found in *R. brunneus* population (zur Strassen, 2003). *R. brunneus* is phytophagous species feeds on flowers of Poaceae (Mound *et al.*, 1976; zur Strassen, 2003) but was also recorded as having predatory tendencies (Mound *et al.*, 2023).

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REFERENCES

- Alavi, J. & Minaei, K. 2018. Studies on the genus *Aeolothrips* (Thysanoptera: Aeolothripidae) in Iran, with a key to species. *Zootaxa*, 4446(3): 343–360.
- Mirab-balou, M. & Chen, X.X. 2010. A new method for preparing and mounting thrips for microscopic examination. *Journal of Environmental Entomology*, 32(1): 115–121.
- Mirab-balou, M. & Chen, X.X. 2012. Iranian thrips of family Aeolothripidae (Thysanoptera: Terebrantia), with four newly recorded species. *Vestnik Zoologii*, 46(6): 499–507.
- Mirab-balou, M. 2018. An updated checklist of Iranian thrips (Insecta: Thysanoptera). *Far Eastern Entomologist*, 361: 12–36. DOI: 10.25221/fee.361.2
- Mound, L.A., Collins, D.W. & Hastings, A. 2023. Thysanoptera Britannica et Hibernica – Thrips of the British Isles. Available at https://keys.lucidcentral.org/keys/v3/british_thrips/html (accessed 18 November 2023).
- Mound, L.A., Morrison, G.D., Pitkin, B.R. & Palmer, J.M. 1976. *Thysanoptera. Handbooks for the Identification of British Insects*. Royal Entomological Society of London, London. 79 pp.
- Nakahara, S. 1991. Systematics of Thysanoptera, pear thrips and other economic species. In: Parker, B.L., Skinner, M., Lewis, T. (eds). *Towards Understanding Thysanoptera*. Proceedings International Conference on Thrips, 1989, Burlington, Vermont. 464 pp.
- ThripsWiki. 2023. ThripsWiki – providing information on the World's thrips. Available at: http://thrips.info/wiki/Main_Page (accessed 05 October 2023).
- Tyagi, K., Kumar, V. & Mound, L.A. 2008. Sexual dimorphism among Thysanoptera Terebrantia, with a new species from Malaysia and remarkable species from India in Aeolothripidae and Thripidae. *Insect Systematics & Evolution*, 39: 155–170.
- zur Strassen, R. 2003. Die terebranten Thysanopteren Europas und des Mittelmeer-Gebietes. *Die Tierwelt Deutschlands*, 74: 1–271.