

The grass-living thrips (Insecta: Thysanoptera) from Iran with the first record of the genus *Arorathrips* Bhatti

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Abstract

A list of grass-dependent Thysanoptera genera in Iran is provided, including *Arorathrips* with one species, *A. mexicanus*, a *Chirothrips*-related thripid genus as a new record for Iranian fauna. The specimens of this species were collected from mixed grasses in the city of Minab located in Hormozgan Province, south of Iran. The importance of grasses as host plants for members of the family Thripidae is briefly discussed.

Introduction

The members of the insect order Thysanoptera exhibit a wide range of bionomics. About 50% are fungivorous, feeding on the hyphae or spores of fungi (Mound, 2003). Of the remaining species, although a few are obligate predators on other small arthropods (Palmer & Mound, 1990), most of them are phytophagous, including several opportunist species considered as crop pests (Lewis, 1997; Moritz *et al.*, 2004). Nine families are recognized in the order Thysanoptera (Mound *et al.*, 2013), of which five (Aeolothripidae, Stenurothripidae,

Melanthripidae Phlaeothripidae, Thripidae) have been recorded in Iran so far (Minaei & Alich, 2007).

The objective of this paper is to provide a list of Thysanoptera genera in which species breed on grasses (family Poaceae) in Iran, and to record the genus *Arorathrips* Bhatti as another grass-dwelling genus, for the first time in this country. Illustrations and diagnostic characters are also included. Full nomenclatural information about Thysanoptera is available on the web (ThripsWiki, 2013).

Materials and methods

The list of Iranian thrips that are associated with grasses is extracted from the published literature. The species discussed here, *A. mexicanus* (Crawford), was collected by beating mixed grasses (Poaceae) onto a plastic tray. The specimens were removed with a fine brush into a collecting vial containing 90% ethyl alcohol. They were then mounted onto slides in Canada balsam using the protocol of Mound & Kibby (1998). Microphotographs were obtained using a Dino-Lite Microscope, Eyepiece Camera. Digital images were enhanced and plates prepared by Adobe Photoshop™ (Adobe Systems Inc., San Jose, CA, USA). The terminology used here follows Minaei & Mound (2010a) and Hoddle *et al.* (2013). All specimens studied are deposited in the collection of the Plant Protection Department, College of Agriculture, Shiraz University, Shiraz, Iran.

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Results

The only recorded member of the family Stenurothripidae in Iran, *Holarthrothrips josephi* Bhatti, feeds on the pollen of date palm (Bhatti, 1986). Concomitantly, two genera of Melanthripidae (*Ankothrips* Bagnall and *Melanthrips* Bagnall) include flower-feeding species in various plant families (Minaei *et al.*, 2012). Grass-living thrips are distributed among another three families. Among these, there are a few species that breed on grasses in Aeolothripidae and Phlaeothripidae, but most grass-living Thysanoptera belong to the family Thripidae, including *Arorathrips mexicanus*, which is discussed below.

Arorathrips mexicanus (Crawford)

Chirothrips mexicana D.L. Crawford 1909: 114.

Arorathrips mexicanus (Crawford); Bhatti 1990: 196.

The genus *Arorathrips* was separated by Bhatti (1990) from the genus *Chirothrips*, and four species were placed in the new genus at that time. However, currently 15 species are placed in this genus, all of which are considered endemic to the New World and breed only in the flowers of grasses (Mound & Marullo, 1996; Mound, 2011; Nakahara & Footitt, 2012). *Arorathrips mexicanus* is recorded here from Iran, and

this is the first record of this genus and species in this country. The genus is distinguished from the closely related genus, *Chirothrips*, in having the mesothoracic endofurca greatly reduced and fore tibia prolonged around the external margin of the fore tarsus.

DIAGNOSIS: Female fully winged. Body color light brown, tarsi yellow, forewing and clavus shaded (Figure 1). Antennae 8-segmented, segment I with median dorsal setal pair wider apart than width of base of segment II, segment II distinctly produced at apex on outer margin with terminal sensorium, segments III-IV with simple sensorium (Figure 2). Head small, with a distinct prolongation in front of eyes, vertex with three pairs of setae. Pronotum trapezoidal, two pairs of prominent posteroangular setae present (Figure 3). Mesothoracic endofurca reduced (Figure 4). Fore tibia extending around external margin of fore tarsus (Figure 5). Tergites with transverse sculpture lines medially; antecostal ridge of tergites II-V with row of small tubercles; campaniform sensilla anterior to median, its setae on tergites I-VIII. Sternites II-IV medially with pattern of tubercles.

Male smaller, wingless, yellow (Figure 6); sternites III-VII medially with circular glandular area (Figure 7).

MATERIAL EXAMINED: 5 females, 5 males, Hormozgan, Minab, from mixed grasses, 20.1.2009 (KM 259).



Figure 1. *Arorathrips mexicanus*, female: adult.

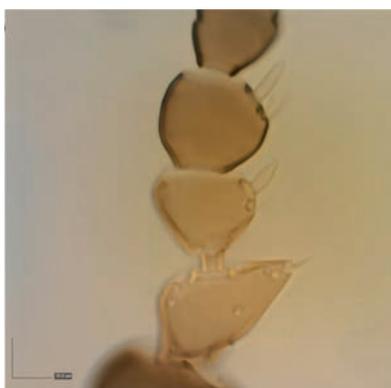


Figure 2. *Arorathrips mexicanus*, female: antennal segments II-IV.



Figure 3. *Arorathrips mexicanus*, female: head and pronotum.

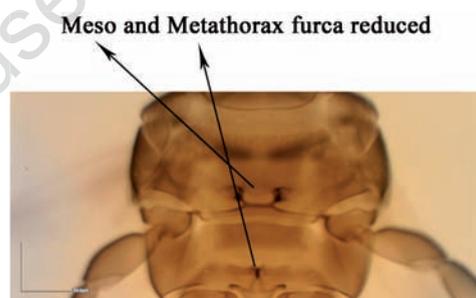


Figure 4. *Arorathrips mexicanus*, female: meso and metathorax furca reduced.



Figure 5. *Arorathrips mexicanus*, female: foretibia and tarsus.



Figure 6. *Arorathrips mexicanus*, male: adult.

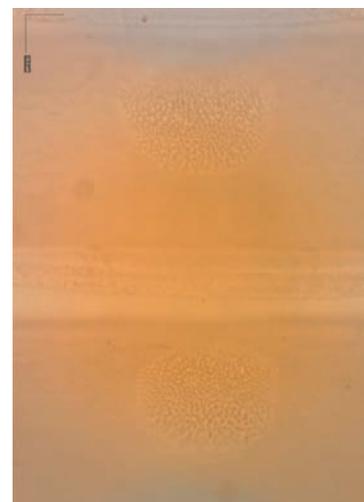


Figure 7. *Arorathrips mexicanus*, male: sternites vi-vii.

Table 1. The genera of Thysanoptera associated with grasses in Iran.

Family	Genus	Reference
Aeolothripidae	<i>Aeolothrips</i> Haliday* <i>Rhipidothrips</i> Uzel	Hoddle <i>et al.</i> , 2013 Mound <i>et al.</i> , 1976
Phlaeothripidae	<i>Haplothrips</i> Amyot and Serville* <i>Cephalothrips</i> Uzel	Minaei & Mound, 2008 Hoddle <i>et al.</i> , 2013
Thripidae	<i>Anaphothrips</i> Uzel* <i>Aptinothrips</i> Haliday <i>Arorathrips</i> Bhatti <i>Bregmatothrips</i> Hood <i>Caliothrips</i> Daniel <i>Chirothrips</i> Haliday <i>Collemboothrips</i> Priesner <i>Eremiothrips</i> Priesner* <i>Exothrips</i> Priesner <i>Florithrips</i> Bhatti <i>Frankliniella</i> Karny* <i>Limothrips</i> Haliday <i>Sitothrips</i> Priesner <i>Sphaeropothrips</i> Priesner <i>Stenchaetothrips</i> Bagnall <i>Stenothrip</i> Uzel	Mound & Masumoto, 2009 Palmer, 1975 Nakahara & Footit, 2012 zur Strassen, 2003 Wilson, 1975 Minaei & Mound, 2010a zur Strassen, 2003 Ramezani <i>et al.</i> , 2009 Bhatti, 1975 Ramezani <i>et al.</i> , 2012 Mound <i>et al.</i> , 1976 zur Strassen, 2003 zur Strassen, 2003 Minaei <i>et al.</i> , 2007 zur Strassen, 2003 zur Strassen, 2003

*Not all species breeding on grasses.

Discussion and conclusions

About 40 Thripidae genera are recorded from Iran (Bhatti *et al.*, 2009), and a large proportion of these (about 40%) live on grasses (Table 1). This is in accordance with the situation reported from Australia (Mound, 2011). Grasses support a rich fauna of thrips (Table 1), possibly due to the availability of a range of such plants in most areas (unpublished lecture by LA Mound at 20th Iranian Plant Protection Congress, Shiraz, Iran, August 2012). Some of the species in the genera listed in Table 1 are considered plant pests in other countries (Lewis, 1997; Moritz *et al.*, 2004). However, no thripid pest is recorded on grasses in Iran. In contrast, one of the species in the family Phlaeothripidae, *Haplothrips tritici* (Kurdjumov) (Minaei & Mound, 2008, 2010b), is an important pest throughout Iran on wheat.

All species in the genus *Arorathrips* have been considered endemic to the New World (Mound & Marullo, 1996; Mound, 2011; Nakahara & Footit, 2012). However, the presence of *A. mexicanus* is not surprising in Iran because this species is introduced around the world and is widely distributed in the tropics and subtropics in association with grasslands (Mound & Palmer, 1972; Mound & Marullo, 1996).

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