First report of an endemic Australian thrips, Thrips australis (Thysanoptera: Thripidae) on Eucalyptus in Shiraz, Iran

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Abstract

The gum tree thrips, Thrips australis (Bagnall) is recorded from Shiraz, Fars province, Iran for the first time. Variation in color and structure of species is discussed and illustrations are provided.

Introduction

The genus Thrips Linnaeus is the second largest genus in the Thysanoptera, and currently includes 286 species worldwide (Mound, 2012). However the genus is absent from the Neotropics, apart from introduced species (Mound and Marullo, 1996). Most species in the genus are flower living, although a few are known to breed on leaves (Mound, 1997; Mound and Kibby, 1998). Some members of the genus are well known as pests in various parts of the world, such as T. angusticeps Uzel, T. flavus Schrank, T. hawaiiensis (Morgan), T. meridionalis Priesner, T. tabaci Lindeman (Moritz et al., 2004) as well as Iran (Minaei et al., 2007). However, for many species there is little information available on their biology, geographical distributions, host associations and structural variation.

Materials and methods

The specimens of Thrips australis discussed below were collected in Shiraz, Fars province, Iran, by breaking up white flowers of Eucalyptus camaldulensis onto a plastic tray. The specimens were removed with a fine brush into a collecting vial containing 95% ethyl alcohol. Microscopic slides were mounted into Canada Balsam after dehydration through a series of ethanol using a form of the protocol given in World Thysanoptera (http://anic.ento.csiro.au/thrips/field_lab/index.html).

Microphotographs were obtained using a Dino-Lite Microscope, Eyepiece Camera. Digital images were enhanced and plates prepared using Adobe Photoshop™. Terminology generally follows Mound (1997) and observed variations within the Iranian specimens.

Key words: Thrips australis, Eucalyptus camaldulensis, Fars province, new record.

Acknowledgements: during my visit to CSIRO Ecosystem Sciences, Canberra, Australia in 2009, Dr. Laurence Mound, encouraged me to collect T. australis from Eucalyptus trees in Iran. He also kindly gave me a slide mount of the species at that time. Dr. Ahmad Reza Khosravi, Department of Biology, Shiraz University kindly recognized the species of Eucalyptus.

Recent years have seen much study into the genus Thrips. The species of Thrips from the Indian region were revised and 33 species were recognized in that area (Bhatti, 1980). Palmer (1992) has given identification keys to 91 species from Oriental and Pacific islands. Nakahara (1994) has treated 62 species from the New World. A key is provided for 8 species from Central America (Mound and Marullo, 1996). Ten pest species of the genus have been treated and a key has been given by Mound and Kibby (1998). Mound and Masumoto (2005) provided an identification key to 41 species from Australia, New Zealand and New Caledonia. An illustrated key is provided to 23 species of the genus Thrips from Peninsular Malaysia (Mound and Azidah, 2009). Thirty-four species are recorded from Africa (Mound, 2010) and subsequently an illustrated key is provided to distinguish the 33 species of genus Thrips recorded from China (Zhang et al., 2011). Finally, an Internet based interactive key has been prepared for 26 species of this genus, including potential invaders from California, North America (Hoddle et al., 2012). In Iran, 26 species of the genus are listed (Table 1) (Bhatti et al., 2009), although the names of two of them, T. iranicus and T. pistaccae, remain in doubt because they cannot be recognized from their original descriptions. The purpose of this paper is to report another Thrips species from Iran, with illustrations and observed variations within the Iranian specimens.

Materials and methods

The specimens of Thrips australis discussed below were collected in Shiraz, Fars province, Iran, by breaking up white flowers of Eucalyptus camaldulensis onto a plastic tray. The specimens were removed with a fine brush into a collecting vial containing 95% ethyl alcohol. Microscopic slides were mounted into Canada Balsam after dehydration through a series of ethanol using a form of the protocol given in World Thysanoptera (http://anic.ento.csiro.au/thrips/field_lab/index.html).

Microphotographs were obtained using a Dino-Lite Microscope, Eyepiece Camera. Digital images were enhanced and plates prepared using Adobe Photoshop™. Terminology generally follows Mound et al., (1976) and Mound and Masumoto (2005).

Most specimens are deposited at the Department of Plant Protection Collection, Shiraz University, Shiraz, Iran.

Results

Thrips australis (Bagnall)

Isoneurothrips australis Bagnall, 1915 (p. 592)
Thrips lacteicorpus Girault, 1926 (p. 17)
Thrips mediolineus Girault, 1926 (p. 18)
Anomalothrips amygdali Morgan, 1929 (p. 5)
Isoneurothrips marisabelae Ortiz, 1973 (p. 119)
Specimens of this species were collected from the white flowers of Eucalyptus camaldulensis at Shiraz and this is the first report of T. australis in Iran. The specimens were compared with one specimen of this species from New Zealand, and also with the available published literature. Although variation in color and structure was observed within the Iranian specimens (Tables 1 and 2), they were distinguishable from other Thrips species by almost a complete row of forewing (Figure 1A), six (instead of five) marginal setae on clavus (Figure 1A), and a bullet shaped antennal segment VI (Figure 1B).

Diagnosis

Macropterous

Body typically yellow usually with brown markings medially on tergites III-VIII, tergites IX-X brown; antennal segment I white, II-III brownish yellow (sometimes I-II white, III brownish yellow, remaining segments almost brown; forewing usually shaded; major setae except ocellars and postoculars dark. Antennae 7-segmented (Figure 1C), III-V with forked sensorial, VI large and bullet-shaped, VII short (Figure 1B). The head is bigger in width than in length (Figure 1D) with ocellar triangle. Pronotum with 2 pairs of short stout postero-angular setae (Figure 1D); posterior margin with 6, 7 or 8 setae. Mesonotum with lines of sculpture close to campaniform sensilla. Metanotum reticulate medially (Figure 1E), median setae III arising within ocellar triangle. Sternite II with 2 pairs of marginal setae, III-VII with 3 pairs. Sternites with a large number of discal setae (Figure 1F); the number of setae increased toward sternites VII; 3 small setae (sometimes 2 or 4) on sternite II but 14-32 developed setae on sternite VII, in irregular double rows (Figure 1H).

MATERIAL EXAMINED. 7 females, Iran, Fars province, Shiraz, from Eucalyptus camaldulensis, 24.06.2012 (KM856); 17 females, same locality, from Eucalyptus camaldulensis, 24.06.2012 (KM861).

Table 1. Thrips species recorded in Iran.

| No. | Species                          |
|-----|----------------------------------|
| 1   | Thrips albopilosus Uzel          |
| 2   | Thrips angusticeps Uzel          |
| 3   | Thrips atratus Haliday           |
| 4   | Thrips coloratus Schmutz         |
| 5   | Thrips dubius Priesner           |
| 6   | Thrips euphorbiae Knechtle       |
| 7   | Thrips flavus Schrank            |
| 8   | Thrips haualentus (Priesner)     |
| 9   | Thrips fasciennis Haliday        |
| 10  | Thrips hauaentis (Morgan)        |
| 11  | Thrips iranicus Yakhontov        |
| 12  | Thrips major Uzel                |
| 13  | Thrips maeoticus (Priesner)      |
| 14  | Thrips meridionalis (Priesner)   |
| 15  | Thrips minutissimus Linnaeus     |
| 16  | Thrips nigropilosus Uzel         |
| 17  | Thrips pelikan Schliephake       |
| 18  | Thrips physapus Linnaeus         |
| 19  | Thrips pillichi Priesner         |
| 20  | Thrips pistaciae Yakhontov       |
| 21  | Thrips simplex (Morison)         |
| 22  | Thrips tabaci Lindeman           |
| 23  | Thrips teherni Priesner          |
| 24  | Thrips verbasci (Priesner)       |
| 25  | Thrips euliteli (Bagnall)        |
| 26  | Thrips vulgatissimus Haliday     |

Table 2. Variation in color and structure of among 39 specimens of T. australis collected in Shiraz.

| Character | Characteristics | Number of specimens |
|-----------|-----------------|---------------------|
| Color of antennal segments* | I-II white, III brownish yellow | 13 |
| Number of posteromarginal setae on pronotum | 6 | 20 |
| Number of discal setae on sternites II | 2 | 14 |

Discussion and Conclusions

Although the species is native to Australia, it has been introduced around the world wherever Eucalyptus trees are grown (Mound, 2010). So it seems likely that the presence of this species in Iran is not surprising. Color and size both vary, and as a result the species has been described under five other names (see above). The variation in color of antennal segments and two character states reported here (Table 2), as well as some other variations which have already been mentioned above (Diagnosis section), support the variability of the species. In addition to Australia (Mound and Masumoto, 2005), Thrips australis has been recorded from many other parts of the world, including Egypt (Priesner, 1965), Japan (Miyazaki and Kudo, 1988), the Pacific regions (Palmer, 1992), Europe (zur Strassen, 2003), United States (Nakahara, 1994), Central America (Mound and Marullo, 1996), Brazil (Monteiro, 2002), Peninsular Malaysia (Mound and Azidah, 2009), Africa (Mound, 2010), Britain (Collins, 2010), China (Zhang et al., 2011) and North America (Holdle et al., 2012). Sakimura (1967) and Kirk (1987) have questioned whether T. australis is native to Australia on the basis that this species has been found in so many countries around the world. However, neither of these authors considered the many field observations that associate this thrips with white Eucalyptus flowers, both in Australia and in other countries (Mound and Masumoto, 2005). In Kenya, T. australis is known from crops such as tomato, capsicum, French bean, sunflower and carrot (Icipe, 2012). However, there are currently no records from any crops in Iran.

*Antennal segments IV-VII in all specimens brown.
Figure 1. *T. australis* (A) forewing; (B) antennal segments VI-VII; (C) left antenna; (D) head and pronotum; (E) metanotum; (F) abdominal tergites VII-IX; (G) abdominal pleurotergites IV-VI; (H) abdominal sternites V-VII.
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