

## First description of the male *Eremiothrips tamaricis* (Thysanoptera: Thripidae)

Kambiz Minaei\* & Maryam Aleosfoor

Department of Plant Protection, College of Agriculture, Shiraz University, Shiraz, Iran.

\*Corresponding author, E-mail: kminaei@shirazu.ac.ir

### Abstract

The specimens of both sexes of *Eremiothrips tamaricis* (zur Strassen) were collected on tamarisk from Kohgiluyeh and Boyer-Ahmad province, south west of Iran. The male of the species is described and illustrated for the first time. It is unique among species of the genus in having transverse pore plates on abdominal sternites III and IV and the presence of small paired postero-marginal processes on tergite IX. The variation in number of posteromarginal setae on the pronotum, as well as host association for this species is briefly discussed.

**Key words:** *Eremiothrips*, Iran, *Tamarix*

### اولین توصیف جنس نر *Eremiothrips tamaricis* (Thysanoptera: Thripidae)

کامبیز مینایی\* و مریم آل عصفور

بخش گیاه‌پزشکی، دانشکده کشاورزی، دانشگاه شیراز، شیراز، ایران

\*مسئول مکاتبات، پست الکترونیکی: kminaei@shirazu.ac.ir

### چکیده

نمونه‌های هر دو جنس گونه *Eremiothrips tamaricis* (zur Strassen) از روی گز در استان کهگیلویه و بویر احمد واقع در جنوب غربی ایران جمع‌آوری شد. جنس نر این گونه برای اولین بار توصیف و تصاویر مربوطه ارائه می‌شود. نر *E. tamaricis* در میان گونه‌های این جنس از نظر داشتن یک جفت زانده کوتاه روی تریژیت نهم و وجود صفحات جنسی عریض روی استرنیت‌های ۳ و ۴ شکمی منحصر به فرد است. تنوع در تعداد موهای حاشیه پستی پیش‌گرده و ارتباط میزبانی گونه به صورت مختصر بحث شده است.

واژه‌های کلیدی: *Eremiothrips*، ایران، *Tamarix*

دریافت: ۱۳۹۸/۰۸/۱۳، پذیرش: ۱۳۹۸/۱۰/۲۱

### Introduction

Eight families are currently recognized in the suborder Terebrantia, of which Thripidae is the largest family with 286 genera globally (ThripsWiki, 2019). Species in this family exhibit a wide range of biology including flower feeding, breeding on young and old leaves, predatory on other small arthropods, living on mosses and feeding on both flowers and leaves (Mound, 1997). Moreover, most of the pest thrips and all of the tospovirus vectors, are the members of this family (Rotenberg *et al.*, 2015). Some flower-living thripids have been demonstrated to be effective as pollinators on particular species of plants (Zerega *et al.*, 2004; Hung *et al.*, 2017). The Palearctic genus, *Eremiothrips* Priesner is one of 40 genera in the *Anaphothrips* genus-group (Masumoto & Okajima, 2017). Members of this genus are

associated with various plants of different families living in semi-desert regions that found mainly between the eastern Mediterranean (Minaei, 2012; 2014) and northern China (Zhang & Feng, 2017).

Most species of Thripidae are bisexual, although males usually constitute 30% or less of any population (Mound, 2005). For a few common species, such as the North American Basswood thrips, *Thrips calcaratus* Uzel, males have never been found (Nakahara, 1994) but individual populations of some other thrips such as *Thrips tabaci* Lindeman, commonly lack males. Of the 21 species recognized in *Eremiothrips* (ThripsWiki, 2019), the males are not described for *E. brunneus* (zur Strassen), *E. imitator* Priesner, and *E. tamaricis* (zur Strassen) so far (Bhatti *et al.*, 2003), which is here described and illustrated for the latter species.

## Materials and methods

Sampling was carried out on leaves and flowers of *Tamarix* sp. from Yasuj, Kohgiluyeh and Boyer-Ahmad province. Most specimens were mounted onto slides in Canada balsam after dehydration through an ethanol series (60%–100%). A few specimens were also mounted onto slides in Hoyer's medium using the protocol of Mound & Kibby (1998).

Morphological terminology follows that of Bhatti *et al.* (2003). The photomicrographs as well as measurements were obtained using an Olympus BX51 phase-contrast microscope with DP27 digital camera using the cellSens software. The materials studied in this paper are deposited in the Department of Plant Protection, Shiraz University.

## Results

### *Eremiothrips tamaricis* (zur Strassen)

*Ascirtothrips tamaricis* zur Strassen, 1975

**Material examined:** 9 females, IRAN, Kohgiluyeh and Boyer-Ahmad province, Yasouj, *Tamarix* sp. (Tamaricaceae), 23.viii.2017 (KM 1708); 3 females, 4 males, same data, 21.viii.2019.

**Diagnosis:** *Female microptera* (Fig. 1). Body pale yellow; antennal segment I yellow, II–IX uniformly shaded (Fig. 3); fore wings shaded (Fig. 7), setae on head and pronotum almost pale, setae on tergites VIII–X shaded. Head broader than long, eyes with 6 pigmented facets ventrally; 3 pairs of ocellar setae present, pair III in front of hind ocelli within triangle, about as long as ocellar setae I and II (Fig. 2). Antennae 9 segmented (Fig. 3), III and IV with forked sensoria; both with microtrichia; segment V with inner sensorium small, less than apical width of segment, VI without pedicel. Pronotum transversely striate with one pair of developed posteroangular setae (Fig. 2); about 15 discal setae present; anterior margin with 3–4 pairs of setae, posterior margin with 3–4 pairs setae about as long as and/or somewhat longer and stouter than discal setae (Figs 2, 4). Mesonotum with transverse lines, one pair of

---

lateral campaniform sensilla present. Metanotal sculpture reticulate in the median third of its width, campaniform sensilla absent (Fig. 5); Fore wing slender with posterior cilia wavy; first vein with about 6–7 setae on basal half and 3 widely spaced setae on distal half (Fig. 7). Abdominal tergites weakly sculptured medially, without ctenidia or craspeda; tergite VIII with comb complete on the posterior margin (Fig. 6), surface with faint transverse reticulation, median campaniform sensilla situated between S1 seta and posterior margin, tergite VIII setae S1 and S2 sub equal; tergite IX median dorsal setae extending to posterior margin of tergite, and with one pairs of campaniform sensilla. Sternites without discal setae.

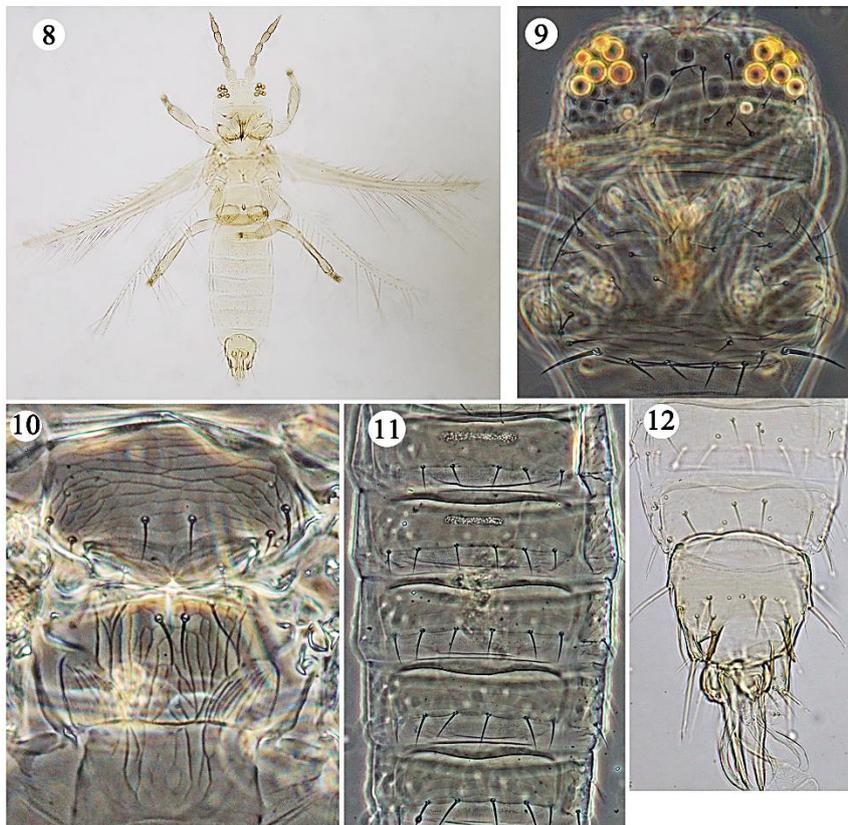


**Figs 1–7.** *Eremiothrips tamaricis*, female **1.** body; **2.** Head and pronotum (2 pairs posteromarginal setae); **3.** Antenna; **4.** Head and pronotum (3 pairs posteromarginal setae); **5.** Meso and metanotum; **6.** Tergites VII-X; **7-** Fore wing.

*Measurements* (one female in microns). Body length 1074. Head length 92; width across eyes 140; ocellar setae III 20. Pronotum length 92; maximum width 180; posteroangular setae 32. Fore wing length 585. Tergite IX setae S1 55, S2 50. Antennal segments I–IX length 17, 26, 33, 30, 28, 29, 7, 8, 11 respectively.

*Male macroptera.* Similar to female in color and structure but smaller and paler (Figs. 8, 10). This is probably the smallest male of the genus with 640–700 microns body length. The number of posteromarginal setae on the pronotum is variable between 2–3 pairs (Fig. 9). Transverse and very thin pore plates present on discal area of sternites III–IV (Fig. 11); tergite IX posterior margin with two processes (drepanae) (20–26 microns long) (Fig. 12).

*Measurements* (one male in microns). Body length 660. Head length 61; width across eyes 116; ocellar setae III 15. Pronotum length 71; maximum width 126; posteroangular setae 30. Fore wing length 495. Sternites III–IV por plates 38 width (w), 3 length (l); 33 (w), 4 (l). Drepana length 23. Antennal segments I–IX length 14, 26, 30, 27, 26, 24, 6, 6, 9 respectively.



**Figs 8–12.** *Eremiothrips tamaricis*, male **8.** body; **9.** Head and pronotum (5 posteromarginal setae); **10.** Meso and metanotum; **11.** Abdominal sternites III-VII; **12.** Abdominal tergites VII-X.

**Differential diagnosis:** In species of *Eremiothrips*, there are 2 sense cones on antennal segment V (outer and inner). In *E. tamaricis* the length of inner sense cone on antennal segment V is short i.e. less than the apical width of segment and about twice as long as the outer sense cone. In contrast, in other species of the genus inner sense cone on antennal segment V is long, about as long as or longer than the width of the segment at apex.

The male of *E. tamaricis* is comparable with seven species in the genus: *E. arya* (zur Strassen), *E. dubius* (Priesner), *E. eshghii* Minaei, *E. hanshanensis* Zhang & Feng, *E. hudeci* (Pelikan), *E. taghizadehi* (zur Strassen) and *E. zurstrasseni* Bhatti, Bagheri & Ramezani in having paired postero-marginal processes on tergite IX (drepanae) and the presence of pore plates on abdominal sternites. However, *E. tamaricis* is distinguished from these species by the presence of pore plate on sternites III and IV comparing to sternites III–VII or IV–VII in the other seven species.

**Distribution and habitat:** the species is known only from Iran and Morocco apparently living on leaves and flowers of *Tamarix* sp.

## Discussion

In the original description of *E. tamaricis*, the number of setae on the posterior margin of pronotum has been stated only 2 pairs (zur Strassen, 1975). However, a paratype female examined by Bhatti *et al.* (2003) showed that there were 3 pairs of posteromarginal setae on the pronotum so they concluded that one pair of setae was overlooked. Examination of specimens collected in this study revealed that there was a variation in the number of setae on the posterior margin of pronotum (Figs 2, 4, 9). Similar variation in the number of pronotal posteromarginal setae was observed by Alavi *et al.* (2013) in two species of *Mycterothrips* Trybom (see also Minaei *et al.* 2017).

The species discussed in this paper was described based on 22 females collected from *Tamarix balansae* and *T. articulata* (Tamaricaceae) in Morocco (zur Strassen, 1975). This was subsequently reported in Iran from Golestan province based on materials collected on barley (Alavi, 2000; Alavi *et al.*, 2007). However, the presence of *E. tamaricis* on grass is unlikely, as the same of the presence of *E. bhatti* Minaei on *Ficus carica*, which is questionable (Minaei, 2012). In contrast, it is evident that *E. similis* Bhatti lives on cereal crops (Ramezani *et al.*, 2009). In the current study, both sexes of *E. tamaricis* have been collected on leaves and flowers of an unknown *Tamarix* (Fig. 13), which is in agreement with the previous data (zur Strassen, 1975) and it seems likely that various species of *Tamarix* are hosts for the species discussed in this paper.



**Fig. 13.** Habitat of *Eremiothrips tamaricis*, around Yasouj, Kohgiluyeh and Boyer-Ahmad province.

### Acknowledgments

The paper is dedicated to Prof. Jitendra S. Bhatti for his critical studies on *Eremiothrips*. Afsaneh Afsharizadeh Bami and Mahsa Hakimara as our students help us in preparation of this paper. Dr. Shahab Manzari (Insect Taxonomy Research Department, Iranian Research Institute of Plant Protection, AREEO, Tehran, Iran) and two anonymous reviewers are highly appreciated for their comments to an earlier draft.

### References

- Alavi, J.** (2000) Faunistic study of Thysanoptera on wheat and barley in Golestan Province. *Proceedings of the 14<sup>th</sup> Iranian Plant Protection Congress*, Vol. I, Pests, p. 227.
- Alavi, J., Modaress Awal, M., Fekrat, L. & Minaei, K.** (2013) The genus *Mycterothrips* (Thysanoptera: Thripidae) in Iran, with three new species. *Zootaxa* 3718, 345-356.
- Alavi, J., zur Strassen, R. & Bagherani, N.** (2007) Thrips (Thysanoptera) species associated with wheat and barley in Golestan province, Iran. *Journal of Entomological Society of Iran* 27, 1-28.
- Bhatti, J. S., Telmadarraiy, Z., Kumar, V. & Tyagi, K.** (2003) Species of *Eremiothrips* in Iran (Terebrantia: Thripidae). *Thrips* 2, 49-110.
- Hung, S. F., Chang, T. L., King, H. B. & Chen, I. Z.** (2017) Flower visitors and potential major pollinator of *Diospyros blancoi* A. DC. in Taiwan. *Philippine Agricultural Scientist* 100 (1), 37-46.
- Masumoto, M. & Okajima, S.** (2017) *Anaphothrips* genus-group: key to world genera, with two new species and three new records from Japan (Thysanoptera, Thripidae). *Zootaxa* 4272, 201-220.
- Minaei, K.** (2012) The genus *Eremiothrips* (Thysanoptera: Thripidae) in Iran, with one new species. *Zootaxa* 3349, 56-62.

- Minaei, K.** (2014) A new species of *Eremiothrips* from Iran (Thysanoptera: Thripidae). *Acta Entomologica Musei Nationalis Pragae* 54, 29-34.
- Minaei, K., Alich, M., Fekrat, L., Aleosfoor, M. & Alavi, J.** (2017) Leaf-feeding *Mycterothrips*: two new species from southern Iran (Thysanoptera: Thripidae). *Zootaxa* 4243, 195-200.
- Mound, L. A.** (1997) Biological diversity. pp. 197-215 in Lewis, T. (Ed.) *Thrips as Crop Pests*. 740 pp. CAB International, Wallingford.
- Mound, L.A.** (2005) Fighting, flight and fecundity: behavioural determinants of Thysanoptera structural diversity. pp. 81-105 in Ananthakrishnan, T. N., & Whitman, D. (Eds) *Insects and Phenotypic Plasticity*. Science Publishers Inc., Enfield, NH, USA.
- Mound, L. A. & Kibby, G.** (1998) *Thysanoptera: An Identification Guide*. CAB International, Wallingford. 70 pp.
- Nakahara, S.** (1994) The genus *Thrips* Linnaeus (Thysanoptera: Thripidae) of the New World. *Technical Bulletin. United States Department of Agriculture* 1822, 1-183.
- Ramezani, L., Bhatti, J. S., Mossadegh, M. S. & Soleimannejadian, E.** (2009) Discovery of *Eremiothrips similis* Bhatti 1988 in Iran (Insecta: Terebrantia: Thripidae). *Thrips* 11, 1-18.
- Rotenberg, D., Jacobson, A. L., Schneewis, D. J. & Whitfield, A. E.** (2015) Thrips transmission of tospoviruses. *Current Opinion in Virology* 15, 80-89.
- ThripsWiki** (2019) ThripsWiki - providing information on the World's thrips. [thrips.info/wiki/](http://thrips.info/wiki/) (accessed 26 October 2019).
- Zerega, N. J. C., Mound, L. A. & Weiblen, G. D.** (2004) Pollination in the New Guinea endemic *Antiaropsis decipiens* (Moraceae) is mediated by a new species of thrips, *Thrips antiaropsidis* sp. nov. (Thysanoptera: Thripidae). *International Journal of Plant Sciences* 165, 1017-1026.
- Zhang, S. M. & Feng, J. N.** (2017) The genus *Eremiothrips* (Thysanoptera: Thripidae) from China, with one new species. *Zootaxa* 4250, 396-400.
- zur Strassen, R.** (1975) Eremophile Blütenbewohner der Fransenflüglergattung *Ascirtothrips* Priesner 1964 (Insecta: Thysanoptera). *Senckenbergiana Biologica* 56, 257-282.
-