

## *Haplothrips zabolius* sp. n., a new species from Sistan & Baluchestan province, southeast of Iran (Thysanoptera: Phlaeothripidae)

K. Minaei<sup>1\*</sup>, J. Alavi<sup>2</sup>, B. Rashid<sup>3</sup> and A. Mokhtari<sup>3</sup>

1. Department of Plant Protection, College of Agriculture, Shiraz University, Shiraz, Iran, 2. Plant Protection Research Department, North Khorasan Agricultural and Natural Resources, Research and Education Center, AREEO, Bojnourd, Iran. 3. Department of Plant Protection, College of Agriculture, University of Zabol, Zabol, Iran.

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

### Abstract

*Haplothrips zabolius* sp. n. is described from two plant species, *Cynodon dactylon* (Poaceae) and *Plantago lanceolata* (Plantaginaceae) from the southeast of Iran. The new species is apparently close to some grass-living *Haplothrips* species: *H. aculeatus* (Fabricius), *H. eragrostidis* Priesner and *H. hukkineni* Priesner. Most specimens of the new species have only one sense cone on the antennal segment III, but it is unusual among Iranian members of the genus in having another sense cone on the antennal segment III in a few specimens.

**Key words:** *Haplothrips*, new species, phytophagous, Plantaginaceae, Poaceae

### چکیده

*Haplothrips zabolius* sp. n. گونه جدید از استان سیستان و بلوچستان، جنوب شرق ایران (Thysanoptera: Phlaeothripidae)

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گونه *Haplothrips zabolius* sp. n. از روی دو گونه گیاه *Cynodon dactylon* (Poaceae) و *Plantago lanceolata* (Plantaginaceae) از جنوب شرقی ایران توصیف شده است. به نظر می‌رسد گونه جدید به برخی از گونه‌های *Haplothrips* موجود روی غلات شامل *H. aculeatus* (Fabricius)، *H. eragrostidis* Priesner و *H. hukkineni* Priesner نزدیک باشد. اغلب نمونه‌های گونه جدید دارای تنها یک عدد اندام حسی روی بند سوم شاخک هستند اما تعداد کمی از نمونه‌ها با داشتن دو اندام حسی در میان اعضای این جنس در ایران نامعمول هستند.

واژگان کلیدی: *Haplothrips*، گونه جدید، گیاه‌خوار، Poaceae، Plantaginaceae

### Introduction

*Haplothrips* Amyot & Serville, with 241 species worldwide, is one of the most species-rich genera in the order Thysanoptera and comparable with *Liothrips* Uzel and *Thrips* Linnaeus with 277 and 293 species, respectively (ThripsWiki, 2015). The majority of the species in this genus are herbivorous living on two plant families, Asteraceae and Poaceae. However, some species are found on plants of other families such as Chenopodiaceae (zur Strassen, 1975; Minaei & Aleosfoor, 2013). Some of them are considered as pests in various parts of the world, e.g. *Haplothrips chinensis* Priesner and *H. tritici* (Kurdjumov) as a pest of rose and *Hibiscus* in Taiwan (Wang & Hsu, 1996), and wheat in Europe and Iran (Minaei & Mound, 2008), respectively. On the other hand, a few are considered to be predators on small arthropods in various parts of the world. They commonly feed on mites on the branches of trees (Bailey & Caon, 1986; zur Strassen, 1995).

Two subgenera, *Haplothrips* (*Haplothrips*) (with 222 species) and *Haplothrips* (*Trybomiella*) (with 19 species) have been recognized in the genus (ThripsWiki, 2015). This division is just based on the lack or presence of fore wing duplicated cilia. However, Minaei & Mound (2008) claimed that *H. (Trybomiella)* is polyphyletic.

Most species in *Haplothrips* are Eurasian (Pitkin, 1976). In Iran, this genus comprises 22 species, i.e. about 10% of the total number of thrips reported from the country, and is considered to be the second largest genus, comparing to the genus *Thrips* with 31 reported species (Minaei, unpublished data). The main objective of this paper is to describe a new species of *Haplothrips* collected on the two plant families Poaceae and Plantaginaceae. The new species, as discussed below, it is similar in colour and structure to other common *Haplothrips* found on Poaceae. A brief information regarding the genera of Haplothripini in Iran is also provided.

## Materials and methods

The new species was collected by beating leaves and flowers of *Cynodon dactylon* (L.) (Poaceae) and *Plantago lanceolata* L. (Plantaginaceae) onto a plastic tray. The specimens were removed with a fine brush into a plastic 2 mm Eppendorf tube containing AGA (a mixture of 10 parts of 60% ethyl alcohol with 1 part of glycerine and 1 part of acetic acid) (Palmer *et al.*, 1989). They were then mounted on slides in Canada balsam according to the protocol provided by ThripsWiki (2015). Terminology follows that of Mound & Minaei (2007) and Minaei & Mound (2008). Measurements, as well as photomicrographs were obtained using a Motic BA310 microscope with Motic Image Plus 2.0 ML software. Figure 9 was sketched using a drawing tube attachment. The holotype and three paratypes (2 males, 1 female) are deposited in the collection of the Department of Plant Protection, College of Agriculture, Shiraz University, Iran (PPSU). Two paratypes, one female and one male, are deposited in the Natural History Museum, London (BMNH). Other paratypes (5 males, 7 females) are deposited in the Agricultural and Natural Resources Research Center of Khorasan-e Shomali, Bojnourd. The following abbreviations are used for pronotal setae: am-antemarginals; aa-anteroangulars; ml-midlaterals; epim-epimerals; pa-posteroangulars. Fore wing sub-basal setae (S1, S2, S3).

## Results

### *Haplothrips zabolius* n. sp.

#### (Figures 1-9)

**Description.** Female macroptera. Body brown, fore and mid tarsi, distal half of fore tibiae yellow, hind tibia yellowish brown; antennal segment I–II dark brown concolorous with head, III yellow, IV–VI yellow with brownish shade, gradually darker towards next segments, VII–VIII uniformly brown (Fig. 2); fore wing hyaline except for basal area; major body setae as well as fore wing sub-basal setae pale, wing retaining setae brown-shaded.

Antennae 8-segmented (Fig. 2), segments III and IV with one (rarely two) and four sensoria, respectively, VII slightly constricted at base, VIII short and broad at base (Fig. 2). Head slightly longer than wide, maxillary bridge well developed, about 0.5 times as broad as head, maxillary stylets retracted near to the base of post ocular setae (Fig. 1); post ocular setae long and finely pointed, extending to posterior margin of eye. Cheeks weakly rounded. Mouth cone short and rounded (Fig. 1).

Pronotum transverse, with faint sculpture lines close to posterior margin; notopleural sutures complete (Fig. 1); five pairs of developed setae present: anteromarginal, antero angular, midlateral and posteroangular setae, all almost pointed, epimeral setae weakly blunt; prosternum with paired basantra and ferna as well as a spinasternum; ferna broad (Fig. 3). Mesonotum transversely weakly reticulate, with no microtrichia, lateral setae well developed. Mesopresternum eroded medially (Fig. 3). Metanotum weakly reticulate, with no microtrichia, median setae slender and acute, upright on anterior half of sclerite (Fig. 4). Fore tarsal tooth conspicuous. Fore wing constricted medially, fore wing sub-basal setae arranged in a triangle (Fig. 6), S1 blunt, S2 and S3 blunt or pointed and approximated, S3 slightly curved, fringe cilia smooth, 2–7 (usually 4–5) duplicated cilia present.

Pelta triangular, weakly reticulate (Fig. 5). Tergite II–VII with wing-retaining setae, anterior pair weaker than posterior one, these being weakest on tergite VII (Fig. 7); tergites II–VII with transverse lines of sculpture, reticulated anteromedial on tergite II, tergites II–VII with 3–4 discal setae lateral to two pairs of developed wing-retaining setae; marginal setae S1 and S2 on all tergites long and finely pointed. Tergite VII with two campaniform sensilla not close to each other (Fig. 7), separated by at least 0.1 width of tergite, with four microsetae around the sensilla; tergite VIII campaniform sensilla further apart, more than twice as those on tergite VII (Fig. 7), three to four microsetae between the sensilla. Tube short, less than twice as long as basal width; anal setae about as long as tube length (Fig. 8).



**Figs. 1–9.** *Haplothrips zabolius* sp. n. Female: 1. Head and pronotum; 2. Antenna; 3. Prosternum; 4. Mesonotum and metanotum; 5. Pelta; 6. Sub-basal wing setae; 7. Tergites VII–VIII; 8. Tergite IX and tube. Male: 9. Pseudovirga.

Measurements. (Female holotype, in microns). Body distended length 2151. Head, length 205; median width 186; postocular setae 47. Pronotum, length 156; width 295; major setae am 29, aa 36, ml 40, epim 71, pa 59. Fore wing length 885; fore wing sub-basal setae 41, 55, 60. Tergite IX setae S1 95, S2 78. Tube length 104; basal width 58. Antennal segments III–VIII length 41, 51, 49, 42, 43, 24.

Male macroptera. Colour and structure similar to female but fore tarsal tooth larger. Sternites with no pore plates; tergite IX setae S2 short and stout. Tube longer than female, almost twice as long as basal width. Pseudovirga slender, weakly wider at apex and bluntly triangular at tip (Fig. 9).

Measurements. (male paratype, in microns). Body distended length 1740. Head, length 184; median width 152; postocular setae 58. Pronotum, length 165; width 276; major setae am 26, aa 31, ml 26, epim 64, pa 38. Fore wing length 715; fore wing sub-basal setae 37, 31, 58. Tergite IX setae S1 67, S2 40. Tube length 108; basal width 46. Antennal segments III–VIII length 41, 54, 47, 42, 38, 25.

**Diagnosis.** The new species superficially looks like some common grass-living *Haplothrips* including *H. aculeatus*, *H. eragrostidis* and *H. hukkineni* in size and colour of body and antennal segments, also in shape of tube and major setae which are pointed or blunt in all these species. However there are combinations of characters which make the species characteristic: one sense cone on antennal segment III (rarely two), maxillary stylets widely apart about one-half of head width and retracted to post ocular setae, five pairs of well developed pronotal setae, distinct fore tarsal tooth in both sexes, triangular arrangement of sub-basal wing setae in which S1 is blunt, S2 and S3 are pointed, and the short tube. The form of arrangement of fore wing sub-basal setae in the new species is unique among mentioned species.

In *H. aculeatus* and *H. hukkineni* tergite VII has two campaniform sensilla close together (the distance between them about half of that between the campaniform sensilla on tergite VIII), whereas in the

new species and *H. eragrostidis* the campaniform sensilla on tergite VII are not close. The latter species is readily distinguished from *H. zabolius* sp. n. by distinctly blunt or capitate major pronotal setae as well as forewing sub-basal setae S1 and S2. Moreover, in *H. aculeatus*, maxillary stylets are about one-third of head width, also pronotal anteromarginal setae are reduced as in *H. hukkineni*. The number of sense cones on antennal segment III in *H. aculeatus* and *H. eragrostidis* is one in contrast to *H. hukkineni* which is two. While there is just one developed sense cone in the new species with a few exceptions that have two sense cones as mentioned in the description. In males, pseudovirga is slender, simple and narrowed towards the apex in *H. aculeatus*, it is slender with a small and transverse pin-head at the apex in *H. hukkineni*, and is slightly narrowed towards the apex and bifid at the tip in *H. eragrostidis*. Pseudovirga in *H. zabolius* n. sp. differs from the three mentioned species by splitting at the apex and being slightly like tongue (Fig. 9).

The species described here is also comparable with those species in which the forewing sub-basal setae are arranged in a triangle, such as *H. caespitis* Priesner and *H. rasoulani* Mirab-balou & Chen (Mirab-Balou & Chen, 2015). However, the new species is distinguishable from both species by having one sense cone on antennal segment III (versus two sense cones in *H. caespitis* and *H. rasoulani*). Furthermore, in *H. caespitis*, all tarsi are yellow (only fore tarsi are yellow in *H. zabolius*) and the fore tarsal tooth is not developed (conspicuous in *H. zabolius*). Moreover, the new species can be recognized from *H. rasoulani* by the following characters: major body setae pale (shaded in *H. rasoulani*); postocular setae finely pointed (weakly capitate in *H. rasoulani*); pronotal setae almost pointed (capitate in *H. rasoulani*).

**Type Materials.** Female holotype, Iran, Sistan and Baluchestan province, Chah-nimeh, from *Plantago lanceolata*, 10.iv.2015. leg. B. Rashid; Paratypes: 4 females, 2 males, same data as holotype; 5 females, 6

males, same locality and date as holotype, from *Cynodon dactylon*, leg. B. Rashid.

**Etymology.** Zabol is a city in Sistan and Baluchestan province, southeast of Iran which is located 211 Kilometres south of Zahedan, the capital of Sistan and Baluchestan province.

### Discussion

Seventy eight genera of Thysanoptera have been recorded in Iran so far (Poorkashkooli *et al.*, 2015) seven of which including *Haplothrips* belong to the tribe Haplothripini (Minaei, 2015). In contrast to most other genera in Haplothripini, many species of *Haplothrips* are very similar so that it is somewhat difficult to distinguish them from each other. However, there is some evidence that show interesting variations among individuals of one particular species although there is little attention to such variations in comparison with fungus-feeding Phlaeothripinae (Mound, 2005; Mound & Tree, 2013). Variations in the measurable and structural characters of the wheat thrips, *H. tritici*, have been discussed by Minaei & Mound (2010). Similarly, colour and structural variations have been found within inter and intra populations of *H. herajius* Minaei & Aleosfoor

(Minaei & Aleosfoor, 2013). More importantly, male genitalia variation in *H. tritici* was clearly demonstrated, so that *Haplothrips cerealis* Priesner regarded it as a synonym of wheat thrips (Minaei & Mound, 2014). In *H. zabolius* **sp. n.**, most of the available specimens have one sense cone on the apical margin of the third segment, but a few specimens have two sense cones although the inner one is smaller than the outer one. Such a variation in the number of sense cones on antennal segments of *Haplothrips* species has rarely been reported (Mound & Minaei, 2007), especially from Iranian *Haplothrips* species. Interestingly, among about 500 examined specimens of wheat thrips, the number of sense cones on antennal segment III is consistently two which are equal in size.

### Acknowledgement

Babak Rhashid is grateful to H.A. Derafshan (graduate student in the Department of Plant Protection, College of Agriculture, University of Zabol) for his active cooperation in field collecting. The authors are grateful to the editor and two anonymous referees who provided us with criticisms and corrections to an earlier draft.

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Received: 27 October 2015

Accepted: 2 March 2016