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A KEY TO SPECIES OF THE GENUS *AEOLOTHRIPS* HALIDAY (THYSANOPTERA: AEOLOTHRIPIDAE) FROM IRAN WITH DESCRIPTION OF A NEW SPECIES

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Summary. *Aeolothrips euphorbiae* Mirab-balou, **sp. n.** is described and illustrated on the base of specimens collected on *Euphorbia cheiradenia* Boiss. & Hohen. (Euphorbiaceae) from Ilam, Kermanshah and Lorestan provinces (Iran). A key to 25 species of the genus *Aeolothrips* Haliday recorded from Iran is also provided.

Key words: thrips, *Aeolothrips*, key, new species, Euphorbiaceae, Iran.

М. Мираб-балу. Определительная таблица видов рода *Aeolothrips* Haliday (Thysanoptera: Aeolothripidae) из Ирана с описанием нового вида // Дальневосточный энтомолог. 2019. N 380. С. 1-7.

Резюме. Из Ирана описан новый вид *Aeolothrips euphorbiae* Mirab-balou, **sp. n.**, собранный на молочае *Euphorbia cheiradenia* Boiss. & Hohen. (Euphorbiaceae) в провинциях Илам, Керманшах и Лурестан. Приведена определительная таблица 25 известных из Ирана видов рода *Aeolothrips* Haliday.

INTRODUCTION

Euphorbiaceae is one of the largest families of flowering plants, with 8000 species. *Euphorbia* with over 2000 species is one of the largest genera in the world that is

cosmopolitan (Radcliffe-Smith, 2001), of which over 80 species of *Euphorbia* are so far reported from Iran (Akhani, 2004). The plants in this family support a diversity of insects, including Thysanoptera.

The family Aeolothripidae with 207 extant species in 24 genera worldwide is the third largest family in the order Thysanoptera, after Phlaeothripidae and Thripidae. More than 50% of the described aeolothripid species are placed in the genus *Aeolothrips* Haliday (ThripsWiki, 2018). Members of this family appear to be facultative predators of other small arthropods, and they feed on both floral tissues as well as on thrips and mites that live in flowers; whereas in the warmer parts of the world, a considerable number of species are obligate predators (Tyagi *et al.*, 2008).

Up to now, the number of 31 species of Aeolothripidae is recorded in Iran (Mirabalou, 2018): *Aeolothrips* with 25 species, *Rhipidothrips* with four species, and *Indothrips* and *Orothrips* each with one species. Here, *Aeolothrips euphorbiae* **sp. n.** is described from Iran based on females and males collected on flowers of *Euphorbia cheiradenia* Boiss. & Hohen. from west of Iran.

MATERIAL AND METHODS

Thrips specimens were collected on flowers of *Euphorbia cheiradenia* B. & H. (Fig. 1) from Ilam, Kermanshah and Lorestan provinces (west of Iran) during 2013–2015. The specimens were collected by shaking plants to white dish and were kept in 70 % alcohol ethanol and transferred to laboratory. Subsequently, thrips mounted onto slides by the protocol given in Mirabalou and Chen (2010) and some specimens were mounted on Canada Balsam. All descriptions, measurements and photos were made with a Leica DM IRB microscope, with a Leica Image 1000 system. Type specimens are deposited in the Collection of Department of Plant Protection, College of Agriculture, Ilam University, Iran (**ILAMU**), and five paratypes in Agricultural & Natural Resource Research Centre of Khorasan-e Shomali.



Fig. 1. *Euphorbia cheiradenia* Boiss. & Hohen. (Euphorbiaceae) – host plant of *Aeolothrips euphorbiae* **sp. n.**

A key is provided according to examined specimens at following collections: Entomological Museum, Northwest A. & F. University, Yangling, Shaanxi Province, China (**NWAFU**); National Zoological Museum of China, Institute of Zoology, Chinese Academy of Sciences, Beijing, China (Han's collection) (**IOZ**); Institute of Insect Sciences, Zhejiang University, Hangzhou, Zhejiang Province (**ZJUH**); Aquatic Insects and Soil Animals, Department of Entomology at South China Agricultural University (**SCAU**), Guangzhou, China; and the Collection of Department of Plant Protection, College of Agriculture, Ilam University, Iran (**ILAMU**); and original descriptions by the following authors: Alavi *et al.* (2015, 2016), Minaei (2013, 2015), Minaei and Alavi (2017).

KEY TO SPECIES OF THE GENUS *AEOLOTHRIPS* HALIDAY FROM IRAN

1. Body mostly yellow 2
 - Body color either dark brown or abdomen bicolored 7
2. Head yellow, concolorous with thorax 3
 - Head brown to dark brown, abdomen bicolored 4
3. Antennal segment IV yellow at least in the basal half; male without clasper on abdominal segment IX *A. montivagus* Priesner
 - Antennal segment IV entirely yellow except at apex; male with clasper on abdominal segment IX *A. euphorbiae* sp. n.
4. Abdominal segments I–VIII yellow, IX–X dark brown *A. bhattii* Alavi et Manzari
 - First abdominal segment brown, other variable 5
5. Antennal segment V shorter than VI–IX *A. iranicus* Minaei
 - Antennal segment V longer than VI–IX 6
6. Abdominal segments V–X mainly brown; antennal segments II and III almost equally white, segment I brown and the distal part of III brown *A. gloriosus* Bagnall
 - Abdominal segments VI–X brown; antennal segments I–III whitish yellow *A. mongolicus* Pelikán
7. Abdomen bicolored brown and yellow 8
 - Abdomen completely brown to dark brown 11
8. Microptera (both sexes usually with wings shorter than thorax width) 9
 - Macroptera 10
9. Abdominal tergite I with close set of transverse striate; abdominal segments II–III sharply yellow *A. albicinctus* Haliday
 - Abdominal tergite I with few transverse striate; abdominal segment I pale brown, II white *A. cursor* Priesner
10. Abdominal segment II and/or III yellow to yellowish brown; fore wings with two separate long brown cross bands *A. ericae* Bagnall
 - Abdominal segments I–VI yellow, VII–X brown to dark brown; fore wings with rather long spot in posterior margin of distal half and two small spots at the anterior margin ... *A. neyrizi* Minaei & Alavi
11. Fore wings with longitudinal dark band along the posterior margin, but without a cross band *A. afghanus* Jensen
 - Fore wings with one or two broad dark bands 12
12. Fore wings with one broad dark band or with two dark bands that connected to the posterior margin 13
 - Fore wings with two transverse dark bands 18

13. Fore wings with only one dark band, the longitudinal dark area on the posterior margin does not reach the tip of the wing *A. zurstrasseni* Minaei
 – Not above characters 14
14. Presence the narrow form of the band along the fore wings posterior margin between the two cross bands 15
 – Presence the wider band along the fore wings posterior margin between the two cross bands 16
15. Head with prolongation; all tibiae pale at distal part; male tergites without tubercles and tergite IX without claspers and stout curved setae *A. versicolor* Uzel
 – Head without prolongation; all tibiae dark brown; male tergites IV–V with paired tubercles and tergite IX with stout curved seta and non-bifurcate clasper
 *A. melaleucus* (Haliday)
16. All tarsi and tibiae dark brown *A. wittmeri* Priesner
 – All tarsi and distal part of all tibiae yellow 17
17. Middle and hind tibiae uniformly dark; antennal segments I–II dark brown, III yellow with grey ring at apex, IV yellow, light brown in distal half and pedicel, V–IX uniformly brown; male with clasper *A. laurencei* Alavi et Manzari
 – Middle and hind tibiae abruptly yellow at extreme apex; antennal segments III–IX yellowish brown, III and IV yellow in basal part; male without clasper *A. eremicola* Priesner
18. Body distinctly bicolored, with prothorax pale yellow and the rest of the dark brown ...
 19
 – Body uniformly brown to dark brown 20
19. Antennal segment I yellowish grey, II and III yellow, III rather abruptly brown in distal half; male abdominal tergites IV–VI without dorsal tubercles, segment IX without claspers, posterior margin of tergite IX convex medially *A. albithorax* Pelikan
 – Antennal segment I dark brown, II yellow in about apical half, III extensively yellow; male tergites IV and V with paired dorsal tubercles, setae at base of claspers on tergite IX shorter than clasper, with stout curved seta lateral to clasper *A. collaris* Priesner
20. Antennal segments III–IV pale-yellow (paler at the base); all tarsi and distal part of all tibiae yellow *A. modestus* zur Strassen
 – Antennal segments III–IV usually brown and the mid and hind tibia as well as tarsi brown 21
21. Abdominal sternites II–VI with discal setae *A. gundeliae* Alavi et Manzari
 – Abdominal sternites II–VI without discal setae 22
22. Antennal segments VI–IX elongate; segment VI 0.59–0.62 times as length as total length of segments VI–IX; segment VI 1.5–1.6 times as long as width
 *A. heinzi* zur Strassen
 – Antennal segments VI–IX not elongate; segment VI 0.8–1.3 times as length as total length of segments VI–IX; segment VI 1.0–1.2 times as long as width 23
23. Abdominal sternite VII with setae pair S1 closer to each other than S2
 *A. tenuicornis* Bagnall
 – Abdominal sternite VII with setae pair S1 far from to each other 24
24. Antennal segment II dark brown, paler distally *A. deserticola* Priesner
 – Antennal segment II largely yellow 25
25. Male with posteroangular setae longer than paired claspers on abdominal tergite IX
 *A. fasciatus* (Linnaeus)
 – Male with posteroangular setae shorter than paired claspers on abdominal tergite IX
 *A. intermedius* Bagnall

DESCRIPTION OF NEW SPECIES

Aeolothrips euphorbiae Mirab-balou, sp. n.

<http://zoobank.org/NomenclaturalActs/639F759D-B157-429A-A432-DE8B45C0CA90>

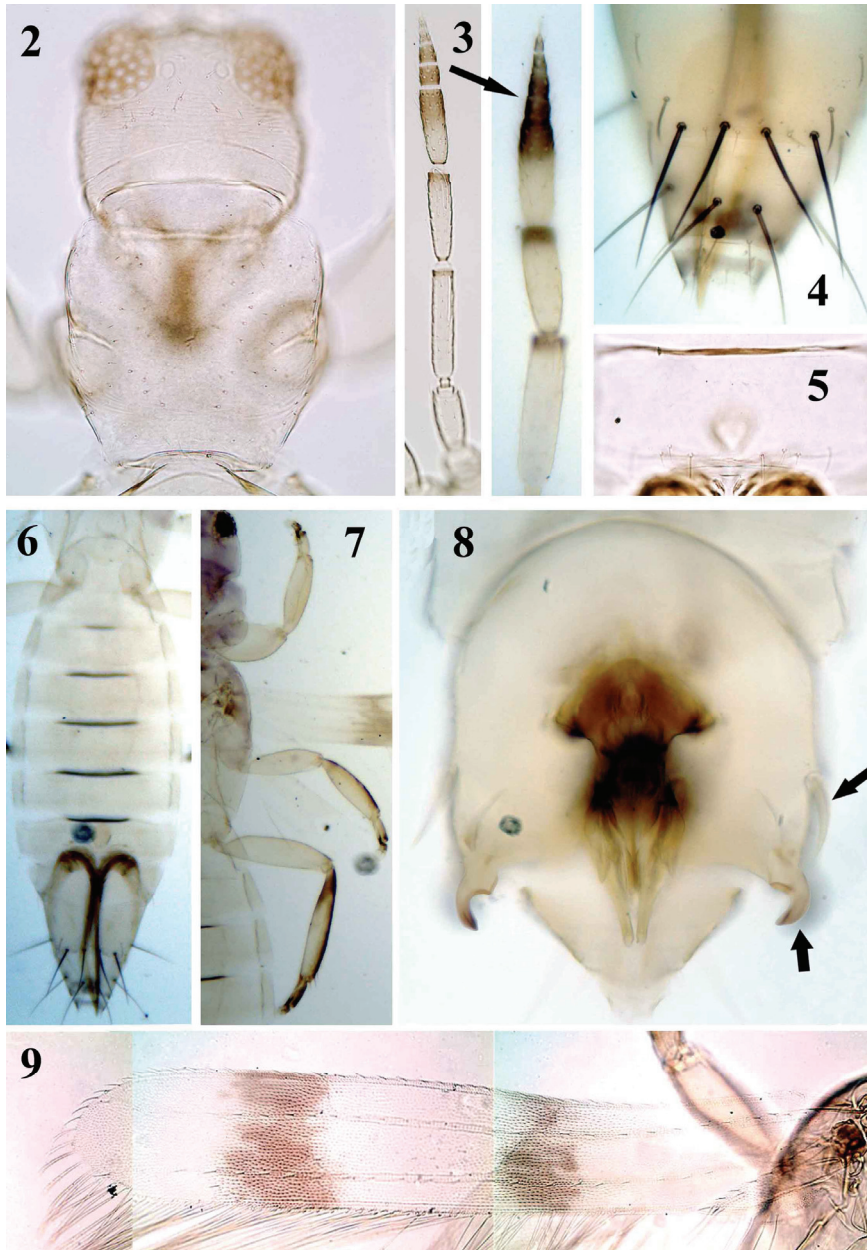
Figs 2–9

MATERIAL EXAMINED. Holotype: ♀, Iran: Ilam Province: Ilam University, Ilam, on *Euphorbia cheiradenia* Boiss. & Hohen. (Euphorbiaceae), 10.V 2013, M. Mirab-balou (ILAMU). Paratypes: 3 ♀ collected with holotype, with same data; Ilam Province: 11 ♀, 3 ♂, Ilam, on *E. cheiradenia*, 24.VI 2015, leg. M. Mirab-balou; 3 ♀, Eyvan, on *Euphorbia* spp., 22.V 2014, leg. Behzad Miri; 4 ♀, 6 ♂, Malekshahi, on *Euphorbia* spp., 31.V 2014, leg. Rahim Allahyar; Kermanshah Province: 4 ♀, Eslamabad, on *Euphorbia* spp., 8.vi.2015, leg. M. Mirab-balou; Lorestan Province: 2 ♀, 1 ♂, Khorramabad, Alashtar, on *Euphorbia* spp., 22.IV 2014, leg. Maryam Nour-Mohammadi.

DESCRIPTION. Female macroptera. Body color pale yellow with more or less grayish spots on the mesothorax; abdominal segments IX–X and sometimes VIII shaded, X darker at apex; antennal segment III & IV with mostly yellow except brown at apex, segment V brown at half apex, segments VI–IX entirely brown (Fig. 3); middle and hind tibiae and tarsi light brown (Fig. 7). Fore wings pale with two brown transverse bands which are not connected (Fig. 9). Abdominal sternites II–VII with dark brown antecostal ridge; major setae on abdominal segments IX–X dark brown (Fig. 6).

Head and pronotum without long setae. Head wider than long, not produced in front of eyes, with weak transverse lines of sculpture, 2 pairs of setae within ocellar triangle arising between posterior ocelli, postocular area with 10–12 pairs of setae in 2 irregular transverse rows (Fig. 1). Antennae 9-segmented, segment III with linear sensorium extending to apical third of segment, IV with sensorium somewhat curved distally and broadened at apex, extending from apex to basal half of segment; segment V as long as VI–IX together (slightly longer in some paratypes). Pronotum not sculptured, with 4–6 pairs of posteromarginal setae. Mesonotum with 1 pair of median setae aligned with lateral setae, with rather wide transverse reticulations. Metanotum with broad reticulation, without internal markings. Abdominal tergite I with 3–4 faint transverse striae anteromedially, with one paired campaniform sensilla posterior to small median setae; tergites II–VIII and X with no transverse striations; IX with numerous faint transverse striations (Fig. 4); tergites II–VII with median setae arising aligned with campaniform sensilla. Abdominal sternites II–VII without transverse striations, sternite II with 3 pairs of submarginal setae, median pair longest; III–VI with 4 pairs of setae, of which 2 median pairs are marginal and 2 lateral pairs situated far from margin; sternites without discal setae; VII with 4 pairs of submarginal setae, S1 as long as S2, with 2 pairs of widely separated accessory (supernumerary) setae (Fig. 5).

Male macroptera. Similar to female in colour and structure, but all legs as colour as body, clear yellow. Middle coxae with stridulatory structure. Abdominal tergites without dorsal tubercles, tergite IX with bifurcate claspers and sickle-shaped setae laterally, and light brown dorsal plate medially. Semilateral setae slightly shorter than claspers (Fig. 8).



Figs 2–9. *Aeolothrips euphorbiae* sp. n. 2 – female head and pronotum; 3 – female antenna; 4 – female abdominal segments VIII–X; 5 – female abdominal sternite VII; 6 – female abdominal sternites, showing antecostal ridge; 7 – female legs, showing color of fore, mid- and hind legs; 8 – male abdominal tergite IX; 9 – female fore wing.

MEASUREMENTS (holotype female). Length (width). Body length 1900. Head 185(220). Pronotum 165(255). Fore wing 850, hind wing 680. Antennal segments I–IX as follows: 30(40), 60(25), 90(30), 70(25), 65(30), 20(25), 20(18), 12(8), and 8(5).

MEASUREMENTS (paratype male). Body length 1350.

DIAGNOSIS. Female of *A. euphorbiae* **sp. n.** is distinguished from *A. montivagus* by color of antennal segments IV (pale except light brown at apical margin *versus* is yellow at least in the basal half) and V (brown at half apex *versus* entirely brown), and color of terminal segments of abdomen (IX–X faintly shaded *versus* X distinctly shaded except basal third). Moreover, they are different in color of middle and hind tibiae (light brown *versus* entirely yellow). Male of the new species is easily distinguished from *A. montivagus* by presence of clasper on abdominal segment IX, and absence numerous small setae on abdominal tergites VI–VIII.

DISTRIBUTION. West of Iran (Ilam, Kermanshah and Lorestan Provinces).

ETHYMOLOGY. This species is named after the genus of plant from which it was collected.

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