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A NEWLY RECORDED GENUS AND SPECIES OF HAPLOTHRIPINI (THYSANOPTERA: PHLAEOTHRIPIDAE) FROM IRAN

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During the study of Iranian thrips in 2008-2010, *Bagnalliella yuccae* (Hinds, 1902) (Thysanoptera: Phlaeothripidae) was collected on the flowers of *Yucca* (Agavaceae) from Alborz and Hamedan provinces, which represents the first record of both the genus and species in Iran. This genus is the fifth member of the tribe Haplothripini recorded from Iran. A key is provided to identifying of the Iranian genera of Haplothripini.

KEY WORDS: Phlaeothripidae, Haplothripini, *Bagnalliella yuccae*, key, fauna, Iran.

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В процессе изучения иранских трипсов в 2008-2010 гг. на цветах юкки (*Yucca*, Agavaceae) был собран *Bagnalliella yuccae* (Hinds, 1902) (Thysanoptera: Phlaeothripidae), что представляет собой первую находку этого рода и вида в Иране. Это пятый род трибы Haplothripini в фауне Ирана. Приводится определительная таблица иранских родов трибы Haplothripini.

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INTRODUCTION

Family Phlaeothripidae (Thysanoptera: Tubulifera) includes 44 species in 16 genera from Iran (Bhatti et al., 2009). Amongst them, 27 species in four genera have been recorded from tribe Haplothripini (subfamily Phlaeothripinae) (Minaei & Mound, 2008). *Bagnalliella* Karny, 1920 with nine described species in the world (Mound, 2011), is the fifth member of this tribe in Iran that is represented here. The genus *Bagnalliella* is an endemic North American genus of Phlaeothripidae with 7 species associated with *Yucca* flowers (Tree, 2010). All species of this genus occurring in colonies on the inner side of the leaf sheaths (Stannard, 1968).

Bagnalliella yuccae was described by Hinds in 1902 from Amherst, Massachusetts and Washington District of Columbia on the East coast of North America on *Yucca filamentosa* and *Solidago* spp. flowers (goldenrod) as *Cephalothrips yuccae* (Tree, 2010); and currently, is known from Japan, Korea, the Mediterranean region of Europe, Russia, North America (Okajima, 2006), Australia (Tree, 2010), China (Mirab-balou et al., 2011), and now Iran. Because of transportation of *Yucca* to many countries around the world by horticultural trade, this species has spread over the world. Detection of this species is difficult because it lives at the base of the leaves of its host plant.

MATERIALS AND METHODS

During the course of study on Iranian thrips in 2008-2010, specimens were collected from *Yucca* flowers. Microscopic slides were prepared using the method of Mirab-balou & Chen (2010). All descriptions, measurements and photos were made with a Leica DM IRB microscope, a Leica MZ APO microscope with a Leica Image 1000 system. All specimens are deposited in the Institute of Insect Sciences, Zhejiang University, Hangzhou, China (ZJUH). Nomenclatural information for all thrips taxa mentioned here are web-available (Mound, 2011).

ORDER THYSANOPTERA

Family Phlaeothripidae

Tribe Haplothripini

Key to Iranian genera

1. Abdominal tergites with one pair of wing-retaining setae; antennal segment III with one sensorium *Plicothrips* Bhatti
- Abdominal tergites with two pairs of wing-retaining setae; antennal segment III with sensoria varied 2
2. Antennal segment III with three sensoria; bases of sub-basal wing setae arranged in a triangle *Neoheegeria* Schmutz
- Antennal segment III with 0, 1 or 2 sensoria 3

3. Mouth-cone long and pointed; forewing without duplicated cilia *Dolicholepta* Priesner
 – Mouth-cone rounded 4
4. Macropterous or micropterous; maxillary stylets close together medially in head, no more than one fifth to one quarter of head width apart; antennal segment III with 2 sensoria; head with several small grooves on cheeks behind eyes; abdominal tergite II with 2 pairs of weak wing-retaining setae; on *Yucca* flowers *Bagnalliella* Karny
 – Usually macropterous; maxillary stylets at least one third of head width apart, often widely separated and with distinct maxillary bridge; antennal segment III with 0, 1 or 2 sensoria; head without small grooves on cheeks behind eyes; on different plants *Haplothrips* Amyot et Serville

***Bagnalliella* Karny, 1920**

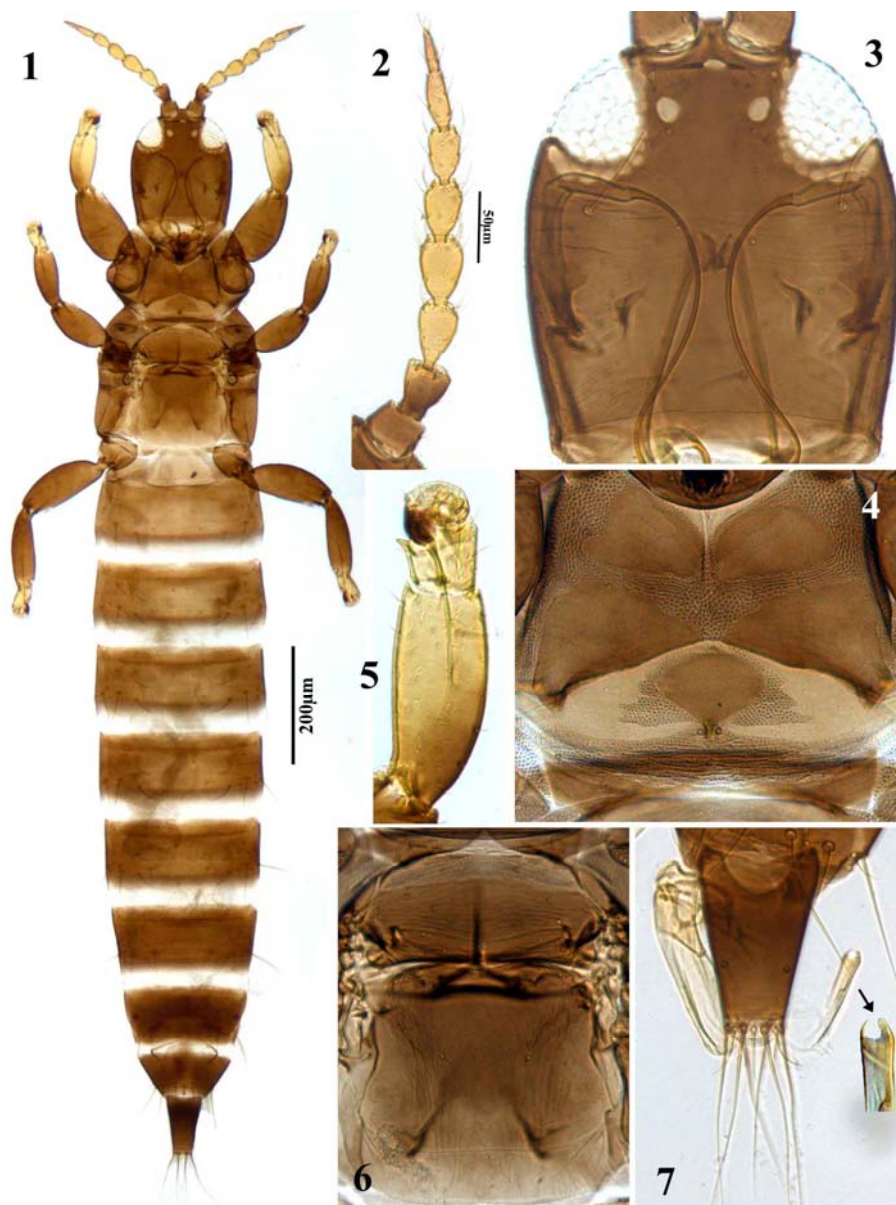
Cephalothrips Hinds, 1902: 188, 194.

Bagnalliella Karny, 1920: 41. Type species: *Cephalothrips yuccae* Hinds, by original designation.

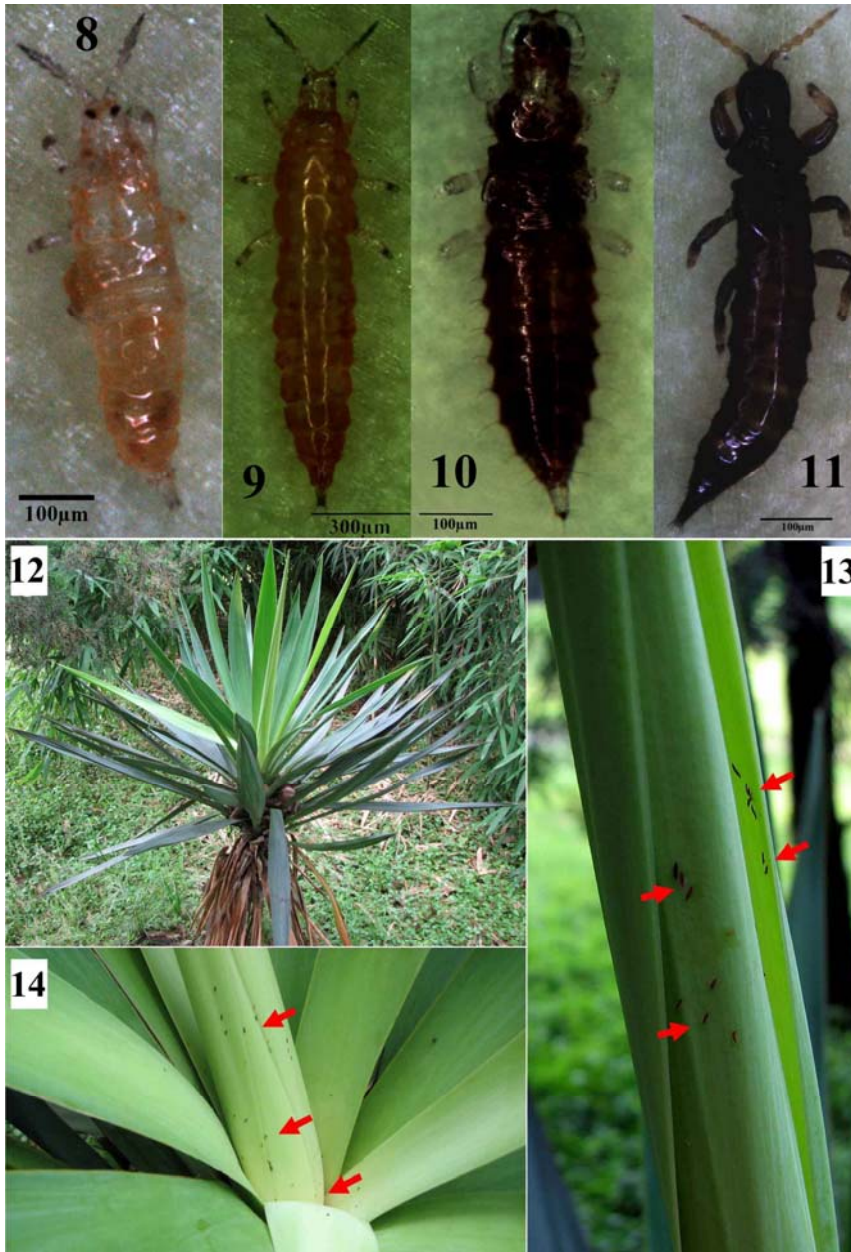
Bagnalliella Watson, 1924: 17, 56.

DIAGNOSIS. Head slightly longer than broad, broadest slightly behind eyes or at about the middle of the cheeks, converging to the base; cheeks with at most only a few sparse, hyaline setae. Eyes not unusually large, about one-third to one-fourth the head length, interocular interval almost twice the eye diameter, not prolonged posteriorly on ventral surface beyond the posterior dorsal margin. Ocelli present, anterior ocellus not lying at base of an anteriorly directed groove. Antennae 8-segmented, less than twice the head length, segments III and IV bearing sense cones. Mouth cone bluntly pointed, never greatly elongate, slightly surpassed by the broadly rounded labium. Prothorax not strongly developed, about one and one-third times broader than long, about one-third as long as head; all major setae present. Wing frequently brachypterous, when fully developed narrowed in the middle, without a prominent median vein, intercalated hairs few. Legs short, stout, fore femora not greatly enlarged in males, fore tarsi in both sexes with a small, acute tooth on inner surface. Praepectal plates present and small. Abdomen not noticeably enlarged, with no lateral processes in either sex. Tube short, stout, less than half as long as head. The tergal wing-retaining setae are weak with the anterior pair sometimes reduced (Cott, 1956; Stannard, 1968).

REMARKS. The genus *Bagnalliella* is morphologically similar to *Haplothrips*, but in ecological aspect, all species in *Bagnalliella* confined to *Yucca* (Figs. 12-14), whereas *Haplothrips* are related with grasses, flowers, etc. The species in these two genera share several character states, including the presence of basantra, forewings constricted medially, and a well-developed maxillary bridge; but species of *Bagnalliella* have short grooves on the dorsal surface of the head behind the eyes and according to this character, this genus differs markedly from *Haplothrips* (Stannard,



Figs. 1-7. *Bagnalliella yuccae* (1-6 female; 7 male): 1 – adult; 2 – antennae; 3 – head; 4 – prosternum and mesopresternum; 5 – fore leg; 6 – meso-metanotum; 7 – abdominal segment X with pseudovirga.



Figs. 8-14. *Bagnalliella yuccae*: 8 – larvae I; 9 – larvae II; 10 – pupa; 11 – female adult; 12 – *Yucca* flower; 13-14 – leaves of *Yucca* infested by *B. yuccae* (Huajiachi Campus at Zhejiang University, Hangzhou, China, 18.VI 2010). (Figs. 12-14 by Dr. GAO Ming-qing).

1968; Mound & Marullo, 1996). In addition, Stannard (1968) mentioned three characters for separate *Bagnalliella* from *Haplothrips* as follows: **(1)** wrinkles behind eyes in the brachypterous form, **(2)** reduction of both the antero-marginal and lateral prothoracic setae, and **(3)** the appearance of the head outline which is slightly broadened anteriorly. Amongst other Iranian Haplothripini, *Bagnalliella* can be distinguished from *Neoheegeria* by two sense cones on antennal segment III (vs. three sensoria in *Neoheegeria*) and bases of sub-basal wing setae that arranged in a triangle in *Neoheegeria* but are arranged in a line in *Bagnalliella*. It is also distinguishable from *Plicothrips* by having two pairs of wing-retaining setae on abdominal tergites (vs. one pair in *Plicothrips*) and two sensoria on antennal segment III (vs. one in *Plicothrips*). *Bagnalliella* by rounded moth-cone and presence of duplicated cilia on forewing can be recognized from *Dolicholepta* (with long and pointed mouth-cone, and forewing without duplicated cilia).

***Bagnalliella yuccae* (Hinds, 1902)**

Figs 1–11, 13, 14

Cephalothrips yuccae Hinds, 1902: 194-195 (types – ♀, ♂; type-locality not given, but either Amherst, Massachusetts or Washington, D.C.). Transferred to *Bagnalliella* by Karny (1920).

Bagnalliella yuccae Karny, 1920: 41.

Bagnalliella yuccae Watson, 1924: 56; Watson, 1926: 22.

Haplothrips ryani Moulton, 1929: 131-132. Synonymized by Cott, 1956: 88.

Haplothrips yuccae Savenko, 1944: 1008 (types – ♀, ♂; type-locality: Buknari, Kobuletsk, district of Adzharsk, Caucasus). Synonymized by Stannard, 1968: 404.

MATERIAL EXAMINED. **Iran:** Alborz province, Karaj, Agricultural College, (51°424' N, 35°672' E, alt. 1149 m), from *Yucca* sp. (family Agavaceae), 30.V 2009, 1♂, 2♀, M. Mirab-balou leg. (in ZJUH); Hamedan province, Hamedan, Saiidieh (48°46' N, 34°78' E, alt. 1942 m), from *Yucca* sp., 6.X 2011, 5♂, 7♀, M. Mirab-balou leg. (in ZJUH).

DIAGNOSIS. Female *macropterous* or *micropterous* (Fig. 11): Body brown (Fig. 1), apex of fore tibia and all tarsus yellow (Fig. 5), antennal segments I-II dark brown, III-VIII yellowish-brown (Fig. 2). Head slightly longer than wide (1.2 times), with several short transverse grooves on cheeks behind compound eyes, postocular setae blunt at apex (Fig. 3). Antennae 8-segmented, segment I truncate, II goblet-shaped, segment III with 2, and IV with 4 sense cones. Maxillary stylets retracted to compound eyes (Fig. 3). Pronotum transverse, prosternal basantra well developed, mesopresternum eroded medially (Fig. 4). Metanotum weakly reticulate, median setae small (Fig. 6). Fore tarsus with small tooth (Fig. 5). Wing lobe shorter than thoracic width. Pelta D-shaped. Abdominal tergites II-VII with 2 pairs of wing-retaining setae.

Male similar to female but smaller; tergite IX setae B2 short and stout; pseudo-virga slender (Fig. 7).

Larvae I and II and pupa of this species (from Chinese specimens) are shown in Figs. 8-10, 13, 14.

MEASUREMENTS (in μm). FEMALE: length (width). Body 2450-2550 (385-410); head 275-285 (245-255), 1.1-1.2 times as long as wide; postocellar setae 70; compound eye 70 (60); distance between to compound eyes 85-90. Antennal segments I-VIII: I 31(36); II 32(28), III 43(26), IV 45(28), V 39(25), VI 37(21), VII 39(14), VIII 31(9). Pronotum 195-205 (335-345), 1.7-1.8 times as long as wide; forewing 118 (48); hind wing 57 (26); abdominal tergite X (tube) 140 (80), 1.7 times as long as wide; tergite IX setae B1 120, B2 100, B3 110. MALE: length (width). Body 2000 (300); pseudovirga about 70; abdominal tergite X (tube) 105 (69), 1.5 times as long as wide; tergite IX setae B1 105, B2 45, B3 105.

REMARKS. This species was identified based on the descriptions by Cott (1956), Stannard (1968) and Moritz et al. (2001). The species of *Bagnalliella* are identified by the number of sensoria on antennal segments III and IV (4 sensoria on segment IV and 2 on third segment), but an invasive population of *Bagnalliella yuccae* from Australia, in which the number of sensoria varied (2, 3, or 4) between individuals and even between left and right antennae of single individuals (Tree, 2010). In this study, we just found 2 sensoria on antennal segment III and 4 on IV from Iranian specimens (only in three collected specimens); and it need more specimens for check these characters.

DISTRIBUTION. Iran (new record): Alborz and Hamedan provinces; China, Japan, Korea, USA, Europe, Australia (Okajima, 2006; Tree, 2010; Mirab-balou et al., 2011).

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