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A new *Ankothrips* species (Thysanoptera: Melanthripidae) from Iran with unusually short setae

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Abstract

Ankothrips zayandicus **sp. n.** is described from Isfahan province, central Iran. It is unique among *Ankothrips* species, also unusual among Melanthripidae, in having no long setae on the head and pronotum. Problems are discussed in defining genera in Melanthripidae and Thripidae on the basis of pronotal setae.

Key words: *Ankothrips*, Isfahan province, Melanthripidae, new species

Introduction

Of the 6000 recognised species in the insect order Thysanoptera, 5600 are grouped into two large families, Phlaeothripidae and Thripidae, with the remaining species distributed in seven small families (Mound 2011). Melanthripidae is one of these smaller families, with 75 species listed in six genera, including several known only from fossils (Mound 2011). The four genera with extant species are: *Ankothrips* Crawford and *Cranothrips* Bagnall each with 12 species, *Dorythrips* Hood with 6 species and *Melanthrips* Haliday with 35 species (Mound 2012a). The first three of these exhibit remarkable discontinuities in geographical distribution that suggest they may represent ancient lineages. *Cranothrips* and *Dorythrips* are known only from the Southern Hemisphere. *Dorythrips* comprises four species in South America and two in Australia, whereas *Cranothrips* has one species in South Africa and 11 in Australia. In contrast, *Ankothrips* and *Melanthrips* species are mainly from the Northern Hemisphere (Hoddle *et al.* 2012). Most *Melanthrips* species are from the Palaearctic, with two known only from North America, and five from India or South Africa. *Ankothrips* comprises seven species from western North America, one from Namibia in south-west Africa, and four from Europe.

Life histories have been described for few species of Melanthripidae, but the members of this family are apparently phytophagous in flowers (Mound & Marullo 1998; Mound 2012b), with some exhibiting strong host specificity (zur Strassen 2003; De Borbon 2009; Pereyra & Mound 2009). Within the genus *Ankothrips*, the host association of the species from Namibia remains unknown, but the seven species from western North America appear to be associated with the flowers of various shrubs with one damaging the young leaves of *Yucca* species (Hoddle *et al.* 2012). Of the four species of *Ankothrips* in Europe three are associated with the flowering tissues of gymnosperm species in the genera *Juniperus* or *Cupressus* (Cupressaceae) (zur Strassen 2003). However, *A. flavidus* Pelikan is known only from one female, and neither *Juniperus* nor *Cupressus* has been found at the type locality in Slovakia (Peter Fedor, personal communication). The purpose of this article is to describe a new species of this melanthripid genus that has been taken from the flowers of a species of *Suaeda* (Chenopodiaceae) in Iran. The only Melanthripidae previously reported from Iran are five species of *Melanthrips* (Minaei & Alichy 2005; Bhatti *et al.* 2009). This new species of *Ankothrips* is interesting because, in contrast to the other known species, the major setae on the head and pronotum are short and weakly sagittate instead of long and acute. The significance of reduction in length of major setae to the systematics of Thysanoptera is discussed.

Methods and depositaries

The thrips were collected into 95% ethanol, and subsequently mounted onto slides in Canada balsam using a form of the protocol given in World Thysanoptera (Mound 2012b). The photomicrographs were prepared using a Leica DM2500 microscope using D.I.C. illumination and Automontage imaging software, and line drawings were sketched using a drawing attachment. Terminology generally follows Mound and Marullo (1998) and Pereyra and Mound (2009).

The holotype and other specimens studied here are deposited in the collection of the Department of Plant Protection, College of Agriculture, Shiraz University, Shiraz. Two females and one male are deposited in the Australian National Insect Collection, Canberra.

Ankothrips zayandicus sp. n.

Female macroptera. Body pale yellow, antennal segments III–IX with apices increasingly darker yellow; fore wing pale with no dark markings, ovipositor brown. Antennae 9-segmented (Fig. 3), segments clearly separate from each other, apex of II prolonged ventrolaterally into acute tooth with smooth margins, sometimes extending to mid-point of III but shorter than apical width of segment II in several specimens (Fig. 4); III and IV long, each with transverse sensorium ventrally at apex (Fig. 6); IX slightly shorter than VIII; II–VIII with transverse rows of microtrichia (Fig. 3). Head wider than long (Fig. 7), produced in front of eyes and extending to apex of antennal segment I; ocellar setae I arising on slightly conical tubercle; one pair of short stout setae on anterior margins of ocellar triangle; one or two pairs of sagittate postocellar setae (Fig. 7); 6–7 pairs of postocular setae in widely spaced irregular rows; vertex with bold transverse lines of sculpture, cheeks convex; anterior tentorial arms stout. Maxillary palps three-segmented; labial palps two-segmented. Compound eyes slightly prolonged ventrally, with no large or pigmented facets. Pronotum with transverse reticulation, posterior margin with 5–6 pairs of small setae (Fig. 9); prosternal ferna entire. Mesonotum transversely reticulate, with no microtrichia (Fig. 8); mesopreepisternum fused to episternum ventrally. Metanotum boldly reticulate, with no microtrichia, small median setae near posterior margin (Fig. 8); campaniform sensilla apparently present. Fore wings with parallel margins, with two longitudinal veins and at least four cross veins (Fig. 1); veinal setae short, scarcely longer than width of a vein, costa with no cilia between the setae (Fig. 5); clavus with 6–8 veinal and one discal setae. Fore tibial apex with two moderately stout ventrolateral setae. Abdominal tergite I with weak transverse lines of sculpture medially; II–VIII with very weak, narrow transverse reticulation medially, bearing small microtrichia on anterolateral lines of each segment; tergite VIII median setae less than 0.5 times as long as tergite (Fig. 2); dorsal setae on IX–X relatively short; tergite X with paired trichobothria. Sternite II with one pair of posteromarginal setae, III–VI with 2–4 pairs, also a transverse row of 12–18 discal setae; VII posterior margin with pair of lobes each bearing two setae.

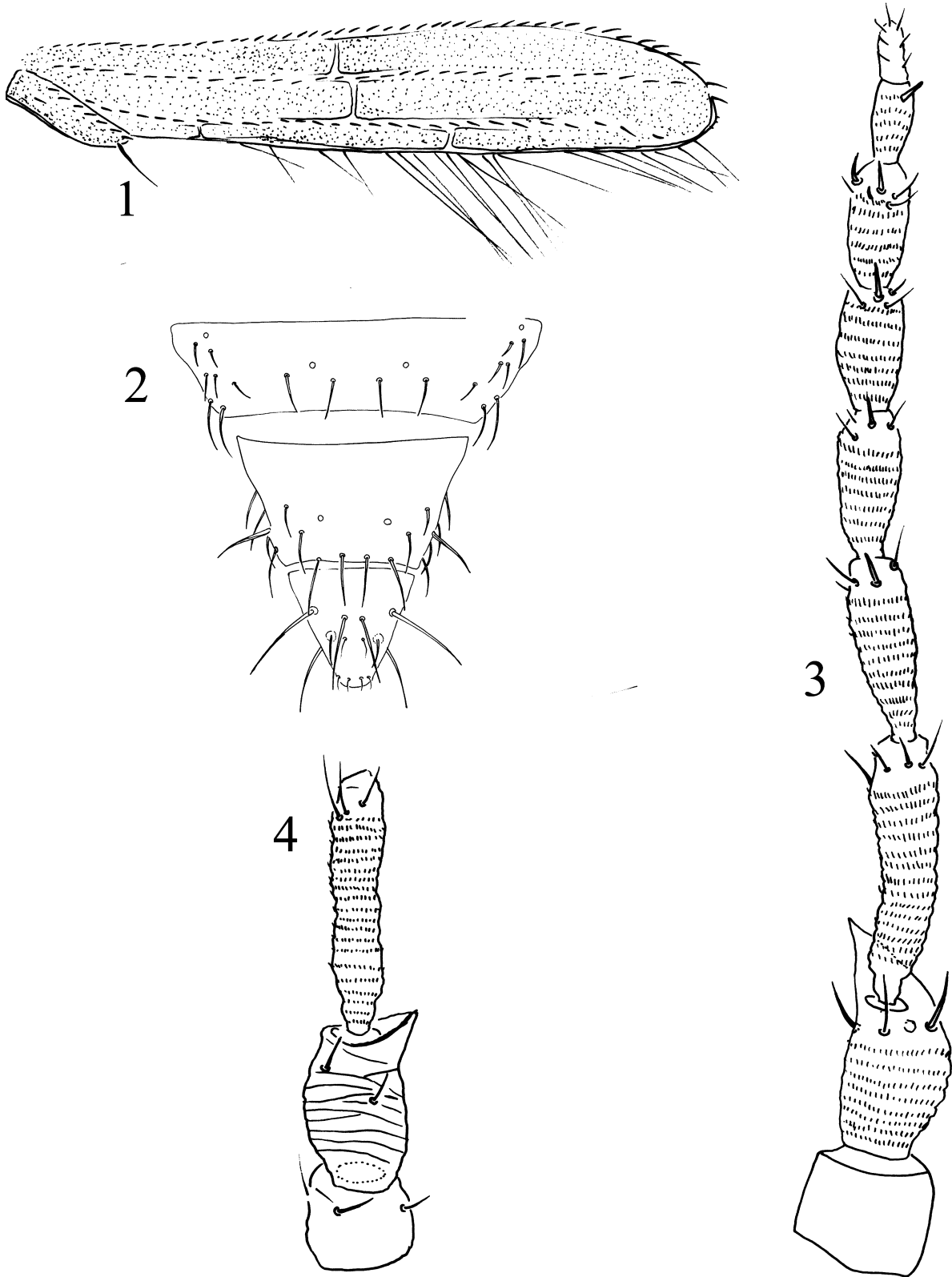
Measurements (holotype female, in microns). Body distended length 1365. Head length (width) 128 (167), inter antennal projection 13. Pronotum length (width) 149 (195). Fore wing length (median width) 747 (133). Tergite IX median setae 45. Antennal segments length (width) I 30 (36), II, including tooth, 63 (31), III 81 (19), IV 56 (18), V 50 (18), VI 47 (18), VII 40 (16), VIII 26 (10), IX 23 (9).

Male macroptera Similar to female in color and structure, but variable in size; antennal segment II tooth weakly developed in small male; abdomen slender, tergite I with paired longitudinal ridges; tergite IX without stout setae; tergite X with a pair of trichobothria (Fig. 10).

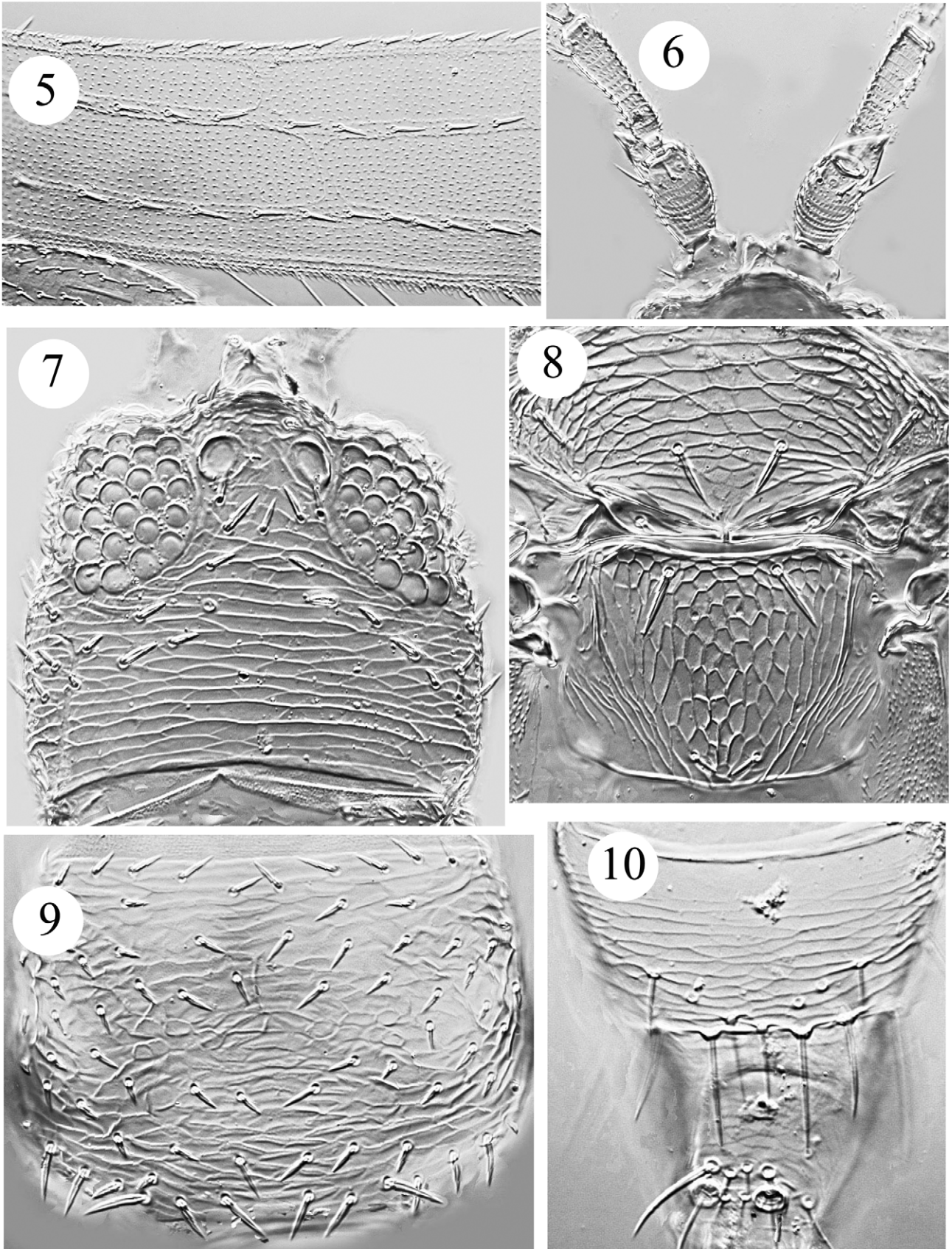
Measurements (paratype male, in microns). Body distended length 1140. Head length (width) 132 (153); interantennal projection 17. Pronotum length (width) 121 (170). Fore wing length (median width) 634 (100). Tergite IX median setae 20. Antennal segments length (width) I 24 (30), II including tooth 52 (24), III 62 (14), IV 47 (15), V 37 (15), VI 35 (15), VII 28 (14), VIII 18 (10), IX 17 (8).

Material studied. Holotype female (right wing is lost) **IRAN**, Isfahan Province, Isfahan, (32° 30' 986" N; 51° 42' 686" E), 1551 m., from flowers of *Suaeda* sp. (Chenopodiaceae), 26.vii.2012 (F. Haftbaradaran).

Paratypes: 1 female, 2 males taken with holotype; 1 female, 1 male, same data except 6.vii.2012; 3 females, 2 males, same data except 24.vii.2012.



FIGURES 1–4. *Ankothrips zayandicus* (1) Fore wing; (2) Female tergites VIII–X; (3) Antenna (sensorium on III–IV is not shown); (4) Basal antennal segments with reduced prolongation on segment II (sensorium on III is not shown).



FIGURES 5–10. *Ankothrips zayandicus* (5) Fore wing, median part; (6) Basal antennal segments; (7) Head; (8) Meso and metanotum; (9) Pronotum; (10) Male tergites IX–X with paired trichobothria on X.

Comments. This species is a member of the Melanthripidae on the basis of the antennae and sternite VII of females, and within that family is recognized as a species of *Ankothrips* because of the prolongation of antennal segment II. It shares with *A. flavidus* from Slovakia not only the pale colour of the body and legs, but also the absence of fringe cilia on the costal margin of the fore wings, the non-serrate margins of the tooth on the second antennal segment, and the short mouth cone. However, *A. flavidus* has the setae on the head and pronotum long and slender (Pelikan 1958), in contrast to the short and weakly sagittate setae of the new species (Figs 7, 9). Moreover, the metanotum of *A. flavidus* is described as “mit länglicher sculptur”, that is with longitudinal sculpture, whereas the metanotum of the new species is clearly reticulate (Fig. 8). All other members of *Ankothrips* have long setae on the head and pronotum, the fore wing costa bears long cilia as well as setae, and the mouth cone of the other three European species is exceptionally long. Tergite IX of males in some of the western American species bears a series of stout setae medially (Hoddle *et al.* 2012), but similar setae are not developed in males of the European species. The variation in length of the tooth on the second antennal segment in *A. zayandicus* is important to consider when considering how to recognize this species.

As in other members of Melanthripidae, *A. zayandicus* is probably univoltine, emerging in spring or early summer, and is likely to be host specific (Mound 2012b). It was collected in low numbers on the flowers of a species of *Suaeda*, together with large numbers of both sexes of *Eremiothrips varius* (Bhatti). This species of Thripidae was described originally from *Suaeda* sp. in India (Bhatti 1967), and has previously been reported from this plant family (Chenopodiaceae) in Iran (Minaei 2012b). The presence of an *Ankothrips* species on this plant is interesting, because three of the European species in this genus live on Cupressaceae (*A. flavidus* is known only from a single female). However, the American species of *Ankothrips* also display considerable differences in host plant associations (Hoddle *et al.* 2012).

Separation of the new species from among large numbers of *Eremiothrips varius* was difficult, because the two species are similar in size and color. Presumably, both are phytophagous, as predation by *A. zayandicus* on *E. varius* would be remarkable for a species of Melanthripidae.

Etymology. Zayandeh River is one of the most important rivers of the central plateau of Iran, and its course runs through the city of Isfahan.

Setal lengths and the definition of Thysanoptera taxa

Traditionally, the number and length of pronotal setae has been considered a major classificatory character in Terebrantia. Because of this, melanthripids were at one time recognised as one of the two subfamilies of the Aeolothripidae, with Melanthripinae distinguished from Aeolothripinae by the presence of long setae on the pronotum (Bailey 1954). However four of the 12 species in the genus *Cranothrips* have the major setae on the head and pronotum no longer than those of typical aeolothripids (Mound & Marullo 1998; Pereyra & Mound 2009). Similarly, the new species described here, *A. zayandicus*, differs from all of the other species in *Ankothrips*, as well as those in *Dorythrips* and *Melanthrips*, in having no long setae on the head and pronotum. The presence of long setae is thus not a good indicator of relationships in this group.

Mound and Palmer (1981) indicated that the length of pronotal setae was also unreliable in defining genera of Thripidae. Although Aptinothripina had been used by various authors for genera of Thripinae with no long pronotal setae, different species of *Dichromothrips* that live on Old World Orchidaceae have 0, 1 or 2 pairs of pronotal posteroangular setae (Mound 1976). Almost all species of genus *Thrips* have two pairs of pronotal posteroangular setae, but a few species have only one pair or no long setae at all (Mound & Masumoto 2005). Similarly, *Frankliniella* species have four pairs of long setae on the pronotum, except that the anterior pairs are sometimes greatly reduced in members of the *minuta* group (Sakimura & O'Neill 1979). All species of *Anaphothrips* have no long pronotal posteroangular setae, with the exception of *A. dalbyi* that has a single pair of more prominent setae (Mound & Masumoto 2009). Of the 17 species in *Eremiothrips*, a genus considered close to *Anaphothrips*, 16 have a single pair of long setae on the pronotum, whereas *E. efflatouni* (Priesner) has no prominent posteroangular setae (Bhatti *et al.* 2003). Conversely, the species in three genera of Thripidae, *Ficothrips*, *Parascolothrips* and *Scolothrips*, all have long setae on the head as well as 4–6 long setae on the pronotum. However, homologies among these long setae are not clear, and the resemblance is probably secondary (Minaei 2012a). For these reasons, caution is needed when attempting to use the presence or absence of long setae as an indicator of relationships among thrips taxa.

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