New Records and Two New Species of the *Anaphothrips* Genus-Group in Iran (Insecta: Thripidae)

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**Abstract:** A key for the identification of eight genera of *Anaphothrips* genus-group (Thysanoptera: Thripidae) from Iran is provided. Two new species of *Rubiothrips*, namely *R. tongi* sp. nov. and *R. parisae* sp. nov., are described and a key to Iranian *Rubiothrips* species is provided. *Thermothrips* Pelikán, *Rubiothrips vitalbae* (Bagnall) and *Oxythrips claripennis* Priesner, are recorded for the first time in Iran.

**Key words:** Thrips, taxonomy, *Rubiothrips*, *Thermothrips mohelensis*.

**Introduction**

*Anaphothrips* genus-group (Thysanoptera: Thripidae) includes 25 genera in the world, comprising thrips which lack long setae or have a single pair of prominent setae on the posterior margin of pronotum (*Mound, Masumoto* 2009) (Figs. 1-2, 4). *Bhatti* (1978) revised the generic concepts of several thripine taxa which lack major setae at the posterior angles of pronotum. *Mound, Masumoto* (2009) provided a key to the Australian species of the *Anaphothrips* genus-group, and they have focused on Thripinae taxa that share the character absence of long pronotal setae. Recently, the Chinese genera and species of this group were also revised by *Mirab-balou et al.* (2012).

So far, seven genera of this group are known from Iran, *i.e.* *Agalmothrips* Priesner (1 sp.), *Anaphothrips* Uzel (2 spp.), *Aptinothrips* Haliday (3 spp.), *Eremiothrips* Priesner (12 spp.), *Oxythrips* Uzel (4 spp.), *Rubiothrips* Schleipke (1 sp.), and *Tamaricothrips* Priesner (1 sp.) (Table 1) (*Zur Strassen* 2003, *Bhatti et al.* 2009, *Mirab-balou, Chen* 2010a). In this paper, an eighth member of this group, *Thermothrips* Pelikán, is recorded in Iran for the first time. In addition, two new species of *Rubiothrips*, namely *R. tongi* sp. nov. and *R. parisae* sp. nov. from Western Iran are described here. *Rubiothrips vitalbae* (Bagnall) and *Oxythrips claripennis* Priesner are newly recorded in Iran. A checklist of species of *Anaphothrips* genus-group (Thysanoptera: Thripidae) recorded from Iran is provided (Table 1).

**Material and Methods**

Specimens were collected from different sites in Iran during 2008–2011. Thrips were prepared and mounted on slides using the method described by *Mirab-balou, Chen* (2010b). All observations, measurements, and photographs were taken using a Leica DM IRB microscope and a Leica MZ APO microscope with a Leica Image 1000 system. All measurements are given in micrometers (μm). Type specimens are deposited in the Institute of Insect Sciences, Zhejiang University, Hangzhou, China (ZJUH); in the Insect Collection, Department of Entomology, South China
Agricultural University (SCAU); and Department of Plant Protection, College of Agriculture, Ilam University, Ilam, Iran.

**Abbreviation.** MPGBAS – Medicinal Plants Garden of Bu-Ali Sina; MCS – metanotal campaniform sensilla.

**Results**

**Key to genera of the Anaphothrips-group in Iran**

1. Pronotum without any posteroangular setae longer than discal setae. .................................1
- Pronotum with at least one pair of posteroangular or posteromarginal setae longer than discal setae... 5

2. Antennal segments III and IV each with simple sense cone ................................................3
- Antennal segments III and IV each with forked sense cone .................................................. 4

3. Antennae 9-segmented; apterous or macropterous; abdominal sternites without discal setae; tarsi 2-segmented; male with a transverse pore plate on abdominal sternites III-VII... *Agalmothrips* Priesner
- Antennae 6- or 8-segmented; apterous; abdominal sternites with or without discal setae; tarsi 1- or 2-segmented (tarsi 2-segmented if antennae 8-segmented, in *A. stylifer* Trybom); male without pore plate on abdominal sternites. **...Aptinothrips** Haliday

4. Median pair of setae (S1) on abdominal tergites II-VIII shorter than distance between their bases; abdominal tergite VIII usually with comb at posterior margin. .................................1
- Median pair of setae (S1) on abdominal tergites II-VIII longer than distance between their bases; abdominal tergite VIII without comb at posterior margin ................................. **...Rubiothrips** Schliephake

5. Tarsi 1-segmented. Pronotum with one or two pairs of posteromarginal setae. [Antennal segment III with a simple sense cone, segment IV with forked sense cone].................. **...Thermothrips** Priesner
- Tarsi 2-segmented. Pronotum usually with four, rarely three or five pairs of postero marginal setae. 6

6. Antennae 9-segmented. **...Eremiothrips** [in part]
- Antennae 7- or 8-segmented. .................................7

7. Abdominal tergites III-VI with lines of sculpture medially; sternites without discal setae. **...Oxythrips**
- Abdominal tergites without lines of sculpture medially; sternites with or without discal setae. 8

8. Head longitudinally striate behind eyes; sternites II with 0-4 discal setae .............................. **...Tamaricothrips**
- Head weakly striate behind eyes; sternites II without discal setae .......................... **...Eremiothrips** [in part]

**Rubiothrips** Schliephake

**Generic diagnosis.** Head slightly wider than its length; interocellar setae situated between two hind ocelli. Antennae 8-segmented, with forked sense cone on segments III and IV. Pronotum on the posterior margin without significant posteroangular setae; ferna generally undistributed, sometimes the two parts separated from each other; mesofurca with spinula. Setae S1 on abdominal tergites II-VII well developed and each pair stands side by side much closer to than their own length; these setae always longer than setae S2; the back edge of tergites smooth; tergite VIII without comb on posterior margin, laterally without ctinidia; abdominal sternites without discal setae.

**Remarks.** *Rubiothrips* species are distinguished from *Anaphothrips* by having paired median setae on the abdominal tergites, long and arising close together, whereas in *Anaphothrips*, they are short and far from each other (*Zur Strauss* 2003). This genus includes seven species, of which only one species, *R. vitis*, has been recorded in Iran (Akbarzadeh Shoukat, Shayesteh 2006). Here, two new species and one newly recorded species are referred to.

**Key to *Rubiothrips* species from Iran**

1. Abdominal tergites III-VI with median setae (S1) situated far from subbasal line (Fig. 3). Head with ocellar setae pair III situated outside of ocellar triangle (Fig. 2). Male with pore plate present on abdominal sternites III-VII (Fig. 5) .............................................. **...R. parisae** Mirab-balou, Chen, sp. nov.
- Abdominal tergites III–VI with median setae (S1) closer to the subbasal line (Fig. 6). Head with ocellar setae pair III arising between posterior margins of hind ocelli. Male with glandular area present on abdominal sternites III-VI (not known in tongi)... 2

2. Body mainly yellow ........................................ 3
- Body brown to dark brown ................................ 4

3. Antennal segments III-V bicolored, III-IV in the basal third white to pale yellow, other parts clearly brown to dark brown.................. **R. vitalbae** (Bagnall)
- Antennal segments III–V uniformly brown .......... **...R. vitis** (Priesner)

**Rubiothrips parisae** Mirab-balou, Chen, New Species

(Figs. 1-5)

**Etymology:** This species is named after first author’s wife, Parisa Heidari.

**Material examined:** Holotype, 1 female, **IRAN**: Hamedan province, MPGBAS, 48º 600’ N, E 34º 867’ (1395m a.s.l.), from flow-
Description: Female macroptera. Body brown, legs brown to brownish yellow, fore-tibiae much paler than mid- and hind tibiae, all tarsi yellowish brown; antennal segments I-II and IV-VIII brown, paler than mid- and hind tibiae, all tarsi yellow; forewings grayish brown.

Material examined: Holotype, 1 female, IRAN: Hamedan province: Abbasabad, N 48°51′, E 34°79′ (1824 m a.s.l.), from leaves of Ambrosia botrys (Chenopodiaceae), 03.vi.2009. The holotype and 15 paratypes are deposited in ZJUH, 4 paratypes in SCAU, 1 paratype in Ilam University.

Measurements (holotype female in microns). Length (width): Body 1860; head 140(200); compound eyes 70, distance between compound eyes 60. Pronotum 150(240). Antennal segments I-VIII length / width as follows: I 22(31); II 42(30), III 52(22); IV 42(22); V 32(21); VI 53(23); VII 17(8); VIII 24(12).

Remarks: This new species easily differs from Rubiothrips species (except R. ferrugineus and R. pillichi) by median setae on sternites III-VII typically located far from the subbasal line (Fig. 3) (vs. S1 setae near subbasal line in other species) and the pore plate of the male situated on the abdominal sternites III-VII. However, R. ferrugineus and R. pillichi were collected from various species of Galium (Rubiaceae) in European countries (ZUR STRASSEN 2003), but in Iran, this new species can be found on the flowers of Galium verum (Rubiaceae) and the leaves of Ambrosia botrys (Chenopodiaceae).

Distribution: Hamedan Province, Iran.

Etymology: This species is named in honor of Professor Xiao-li Tong of South China Agricultural University, Guangzhou, China.

Material examined: Holotype, 1 female, IRAN: Hamedan province: Abbasabad, N 48°51′4″, E 34°79′5″ (1824 m a.s.l.), from flowers of Sonchus arvensis (Asteraceae), 09.vii.2009.

Paratypes (all collected by M. Mirab-balou): 2
females, collected with the holotype, with the same data; 2 females, Hamedan province, Saiidieh, 48º 46′ N, 34º 78′ E (1942m a.s.l.), from leaves of *Ambrosia botrys* (Chenopodiaceae), 03.vi.2009. The holotype and 2 paratypes are deposited in ZJUH, 1 paratype in SCAU, and 1 paratype in Ilam University.

Description: Female macroptera. Body and legs light brown, some specimens with dark brown body; antennal segment I white, II-VIII brown, bases of segments II-V paler than others; fore wings light brown. Abdomen with major setae dark. Head about 1.4-1.6 times broader than long; the area behind the eyes and ocellar triangle with transverse sculpture; three pairs of small ocellar setae present, pair III situated inside of the ocellar triangle; eyes with 6 pigmented facets; postocular setae III. Head about 1.4-1.6 times broader than long; the area behind the eyes and ocellar triangle with transverse sculpture; three pairs of small ocellar setae present, pair III situated inside of the ocellar triangle; eyes with 6 pigmented facets; postocular setae III. Mouth-cone long, reaching to the posterior margin of the prosternum. Maxillary palps 3-segments. Antennae 8-segmented, antennal segments III and IV each with a forked sense cone; segment I without dorsal apical setae; segment III 3.3-4.0 times as long as broad, segment V 2.2-2.4 times as long as broad; segments II-VI with rows of microtrichia on both the dorsal and ventral surfaces. Pronotum with transverse lines of sculpture, without long setae on the posterior margin, about 1.5 times as long as wide; 4-5 pairs of postero marginal setae present. Mesonotum with a pair of CPS anteromedially. Metanotum with a pair of CPS, median setae short and thick, arising well behind the anterior margin. Mesothoracic furcae with spinula, absent on metathoracic furcae. Forewings veinal setae long, with 7–8+1+2 setae in the first vein, about 9-10 setae in the second vein, clavus with 4 marginal setae and one discal seta. Abdominal segments with brown markings medi-

Table 1. The recorded species of *Anaphothrips* genus-group in Iran.

<table>
<thead>
<tr>
<th>Thrips species</th>
<th>Distribution in Iran (province-wise) [* new distribution place on Iran]</th>
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</thead>
<tbody>
<tr>
<td><em>Agalmothrips parviceps</em> Priesner</td>
<td>Khorasan, Khuzestan</td>
</tr>
<tr>
<td><em>Aptinothrips stylifer</em> Trybom</td>
<td>Khorasan, Tehran, Molestan, Hamedan’</td>
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<tr>
<td><em>Eremiothrips antilope</em> (Priesner)</td>
<td>Khorasan, Khuzestan</td>
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<tr>
<td><em>Eremiothrips arya</em> (zur Strassen)</td>
<td>Tehran</td>
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<tr>
<td><em>Eremiothrips bhattii</em> Minei</td>
<td>FARS</td>
</tr>
<tr>
<td><em>Eremiothrips dubius</em> (Priesner)</td>
<td>Kerman, Yazd, Alborz’, Hamedan’</td>
</tr>
<tr>
<td><em>Eremiothrips efflatouni</em> (Priesner)</td>
<td>Khorasan-e-Shomali, Yazd, Khorasan-e-Shomali</td>
</tr>
<tr>
<td><em>Eremiothrips farsi</em> Bhatti, Telmadarraiy</td>
<td>Mazandaran</td>
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<tr>
<td><em>Eremiothrips shirabudinensis</em> (Jaknontov)</td>
<td>Kerman, Khorasan, Yazd, Khorasan-e-Shomali</td>
</tr>
<tr>
<td><em>Eremiothrips similis</em> Bhatti</td>
<td>Khorasan-e-Shomali, Yazd, Khorasan-e-Shomali</td>
</tr>
<tr>
<td><em>Eremiothrips taghizadehi</em> (zur Strassen)</td>
<td>Golestan, Tehran, Khuzestan</td>
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<tr>
<td><em>Eremiothrips tamaricis</em> (zur Strassen)</td>
<td>Golestan, Tehran, Khuzestan</td>
</tr>
<tr>
<td><em>Eremiothrips varius</em> (Bhatti)</td>
<td>Golestan, Khuzestan</td>
</tr>
<tr>
<td><em>Eremiothrips zurstrusseni</em> Bhatti et Ramezani</td>
<td>Khorasan-e-Shomali, Khuzestan</td>
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<tr>
<td><em>Oxythrips halidayi</em> Bagnall</td>
<td>Khorasan-e-Shomali, Khuzestan</td>
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<tr>
<td><em>Oxythrips retamae</em> (Priesner)</td>
<td>Khorasan-e-Shomali, Khuzestan</td>
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<tr>
<td><em>Oxythrips ulmiflorium</em> (Haliday)</td>
<td>Golestan, Khuzestan</td>
</tr>
<tr>
<td><em>Oxythrips wiltshirei</em> Priesner</td>
<td>Fars</td>
</tr>
<tr>
<td><em>Rubiothrips vitis</em> (Priesner)</td>
<td>Azarbaijan-e-Gharbi, Kermanshah’</td>
</tr>
<tr>
<td><em>Tamaricothrips tamaricis</em> (Bagnall)</td>
<td>Kerman</td>
</tr>
</tbody>
</table>
New Records and Two New Species of the *Anaphothrips* Genus-group in Iran...

1 - antennal segments V–VIII, 2 - head, 3 - abdominal tergite III, 4 - sternite IV, 5 - pore plate on sternite VII (male), 6–7: *R. tongi* sp. nov., 6 - abdominal tergite III, 7 - tergite IX.


ally, and shaded laterally. Abdominal tergites II-VIII sculptured with longitudinal lines but smooth medially, laterally with irregular microtrichia on sculpture lines; tergites with a pair of long median setae (S1) much closer together, about 6-12 µm away (Fig. 6); S1 setae on abdominal tergites III-VI close to the subbasal line (Fig. 6); tergite VIII without postero-marginal comb; tergites without ctenidia and craspeditum; tergite IX on each side with a minute seta between S1 and S2 setae (Fig. 7). Abdominal sternites without discal setae; sternite II with two pairs of postero-marginal setae, three pairs on III-VII; median setae on sternite VII arising slightly in front of the posterior margin. Ovipositor well-developed.

**Measurements (holotype female in microns).**
Length (width): Body 1420; head 125(182); compound eyes 70, distance between compound eyes 45. Antennal segments I-VIII length / width as follows: I 22(32); II 42(32), III 55(12); IV 52(22); V 45(20); VI 53(24); VII 12(8); VIII 22(5); pair of long setae medially 30–50. Ovipositor 190-210.

**Male:** Unknown.

**Remarks:** This new species is similar to *R. vitis*, but is distinguished from the latter by the following characters: body color brown to dark brown (vs. mainly yellow in *vitis*); position of ocellar setae pair III which is situated inside of the ocellar triangle (vs. between the posterior margins of hind ocelli in *vitis*); antennal segment I white, II-VIII brown, bases of segments II-V paler than others (vs. V-VIII brown, IV light brown distally, II & III slightly shaded in *vitis*); antennal segment V 2.0-2.3 times as long as broad (vs. 1.7-1.9 times as long as broad in *vitis*); forewings light brown, with long veinal setae (vs. faintly shaded, with small veinal setae); abdominal tergites II-VIII with brown markings medially, and shaded laterally, sculptured with longitudinal lines but smooth medially (vs. yellow abdomen with small brown marking medially, and median area of tergites with transverse lines of sculpture).

According to the key provided by Zurstrassen (2003), this new species is related to *R. sordidus*, but can be separated from the latter because the antennal segment III is shorter (50-55 µm) (vs. 56-63 microns in *sordidus*); abdominal tergite IX with small setae on each side between the setae S1 and S2 (vs. absent in *sordidus*); and metascutum with a pair of CPS (vs. without CPS in *sordidus*).

This new species is associated with the plant families Asteraceae and Chenopodiaceae, whereas, *R. sordidus* was collected from *Galium* species from European countries; and *R. vitis* was collected from grape leaves (Vitaceae) in European countries and Israel (Zurstrassen 2003).

**Distribution:** Hamedan Province, Iran.

**Rubiothrips vitalbae** (Bagnall)


**Note:** This species was identified based on the characters given by Zurstrassen (2003) and here it is recorded for the first time in Iran. This species is readily distinguished from other Iranian *Rubiothrips* by the presence of pore plates on the male abdominal sternites III-VI, antennal segments III-V each in two colors, dark and light brown, and metascutum with a pair of CPS.

**Rubiothrips vitis** (Priesner)

**Material examined.** IRAN: Kermanshah Province: 6 females, Kamshur, N 47º100’, E 34º717’ (1647 m a.s.l.), from leaves of *Vitis vinifera* (Vitaceae), 15.vi.2009; M. Mirab-balou, (in ZJUH).

**Note:** This species (both female and male) was first recorded for the fauna of Iran by Akbarzadeh Shoukat, Shayesteh (2006) from Azarbaijan-e-Gharbi Province (without any details); and here, is
the first record for Kermanshah Province. According to ZUR STRASSEN (2003) and MORITZ et al. (2001), this species has no campaniform sensilla (CPS) on the metascutum, but there is intraspecific variation among Iranian populations of this species, as we examined four specimens with CPS present on the metascutum and two without this character but with the other characters being the same.

**Oxythrips claripennis** Priesner

**Material examined:** IRAN: Hamedan Province: Hamedan, 4 females, 1 male, Darreh Morad Beyg, from flowers of *Malus pumila* (Rosaceae), 08.v.2009, (in ZJUH); Hamedan Province, 2 females, Eram Bld., from flowers of *Euphorbia* sp. (Euphorbiaceae), 05.vi.2009, (in ZJUH); Hamedan Province, 1 female, Aliabad-e Varkaneh, from flowers of *Euphorbia* sp. (Euphorbiaceae), 08.vi.2009, M. Mirab-balou, (in ZJUH).

**Note:** The male and females of this species were collected from different sites of Hamedan province, Western Iran, and here the species is recorded for the first time in Iran. This species was identified based on the key given by ZUR STRASSEN (2003) and easily distinguished from other species by lack of metanotal metascutum and two without this character but with the other characters being the same.

**Thermothrips** Pelikán

**Material examined:** IRAN: Hamedan Province: Bu-Ali Sina University, 48° 514’ N, 34° 795’ E (alt. 1824m), 2 females, from flowers of *Convolvulus arvensis* (Convolvulaceae), 19.v.2008, M. Mirab-balou, (in ZJUH).

**References**


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