

## The *Thrips* genus-group (Thysanoptera: Thripidae) in Iran

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### Abstract

The monobasic genus *Sphaeropothrips* is recorded in Iran for the first time. This is the fourth member of the *Thrips* genus-group recorded from Iran, and a key is provided to distinguish these four genera. Information about these four genera is provided, and some problems in the recognition of true host-plant associations in Iran are discussed.

**Key words:** *Sphaeropothrips vittipennis*, *Thrips* genus-group, rice, Iran, Mazandaran province

### چکیده

جنس تک گونه‌ای *Sphaeropothrips* برای اولین بار از ایران گزارش می‌شود. این جنس چهارمین عضو گروه جنس *Thrips* می‌باشد که تاکنون از ایران گزارش شده‌اند. کلیدی جهت تشخیص این چهار جنس ارائه می‌شود. همچنین اطلاعاتی در مورد این چهار جنس و برخی مشکلات در تشخیص میزبان گیاهی واقعی بال ریشکداران ایران مورد بحث قرار می‌گیرند. واژگان کلیدی: *Sphaeropothrips vittipennis*، گروه جنس *Thrips*، برنج، ایران، استان مازندران

### Introduction

The known species of Thysanoptera are classified into nine families (Mound, 2002a). However, 93 percent of these species are placed in either the Thripidae or the Phlaeothripidae, and it is members of these two families that are normally found on crops (Mound, 1997). Mound & Palmer (1981) listed a series of Thripidae genera as members of the *Thrips* genus-group and allowing for subsequent synonymies (Bhatti & Mound, 1981), this group now comprises the following 14 genera: *Baliothrips* Uzel, *Bolacothrips* Uzel, *Bournierothrips* Bhatti, *Ctenidothrips* Priesner, *Ernothrips* Bhatti, *Fulmekiola* Karny, *Larothrips* Pitkin, *Microcephalothrips* Bagnall, *Rhinotripiella* zur Strassen, *Sphaeropothrips* Priesner, *Stenchaetothrips* Bagnall, *Stenothrips* Uzel, *Thrips* Linnaeus and *Toxonothrips* Moulton. Members of this group are characterized by the following character states: head with ocellar setae I absent, abdominal tergites V-VIII with paired ctenidia laterally, tergite VIII with ctenidia posteromedial to the spiracles, tergites VI-VII discal setae S2 usually larger than S1 and S3 (Mound, 2002b; Mound & Masumoto, 2005).

So far a total of 162 species of Thysanoptera have been reported from Iran (Bhatti *et al.*, 2003; Hasani & Fallahzadeh, 2005), of which 100 species in 40 genera are members of the family Thripidae. Amongst these genera the following three are members of the *Thrips* genus-group: *Microcephalothrips*, *Stenothrips* and *Thrips*. In this paper, an additional genus in this group is reported for the first time from Iran, and a key to separate these four genera provided.

## Materials and Methods

The single specimen of *Thrips* genus-group discussed below was collected, together with several specimens of the Phlaeothripidae, *Haplothrips aculeatus* (Haliday), by beating ears of rice (*Oryza sativa*) onto a plastic tray. The specimen was removed with a fine brush into a collecting vial containing AGA, a mixture of 60% ethyl alcohol (10 parts), glycerine (1 part) and glacial acetic acid (1 part). A microscopic slide mount was prepared using a form of the protocol given in Mound & Kibby (1998).

## Results

### *Sphaeropothrips vittipennis* (Bagnall)

*Baliothrips vittipennis* Bagnall, 1927, 574-575

*Sphaeropothrips inauditus* Priesner, 1928, 322

A single female of this species was collected from the ears of rice at Chalous (Mazandaran province), and this is the first report of *Sphaeropothrips* in Iran. This female was compared with specimens of this species from Japan, and also with the available published descriptions. The only member of the genus, this species has been recorded from Poland, northern Germany, France, England, Austria, Hungary, Czechoslovakia, Egypt, and India (zur Strassen, 2003). Moreover, specimens of both sexes have been studied recently from Okinawa (Japan), through the courtesy of Kazushige Minoura (Naha Plant Protection Station, Okinawa, Japan). This thrips is grass-living, and the genus *Sphaeropothrips* was at one time synonymised with another grass associated genus, *Baliothrips* (see Bhatti & Mound, 1981). However, these genera were distinguished by Bhatti & Mound (1981); see also zur Strassen (2003).

**Diagnosis** – Body brown, antennal segments III and IV pale-brown, tarsi and apices of tibiae yellow, forewings pale but with darker bands medially and at apex. Head about as long as wide, projecting slightly in front of eyes, width narrower across cheeks than across eyes, and cheeks with a notch behind eyes (fig. 1); ocellar setae pair II and III small, II arising anterolateral to ocellar triangle, shorter than III; III arising within or on anterior margins of ocellar triangle; three pairs of post ocular setae arranged in a transverse line, but postocular setae I often displaced toward ocelli. Antennae 7-segmented, with forked sensorium on segments III and IV. Pronotum anterior margin with 5 pairs of small setae (fig.1); one pair of midlateral setae almost as long as two pairs of posteroangulars. Tarsi 2-segmented; mesonotum transversely reticulate; metanotum longitudinally reticulate, median paired setae

distant from anterior margin, campaniform sensilla usually absent; wings fully developed, first vein with wide interval in setal row before 2 setae near apex, clavus with 4 or 5 marginal setae. Abdominal tergites V-VIII with paired lateral ctenidia, on tergite VIII situated mesad of spiracle; tergite VIII posterior margin with irregular row of small microtrichia laterally; setae on tergites IX and X stout; tergum X longitudinally split incomplete. Abdominal sternites without discal setae; sternites III-VI usually with 3 but sometimes with 4 pairs of marginal setae. Male with tibiae more extensively yellow; sternites III-VII each with broad glandular area.

**Material examined** – Iran: Mazandaran province, Chalous, 1 ♀ from *Oryza sativa* (Poaceae), 1.viii.2005. Japan: Okinawa, Ginowan, 3 ♀ from *Ipomoea aquatica* (Convolvulaceae), 5.II.2005; 3 ♂ from Gramineae, 26.iii.2005, (K. Minoura).

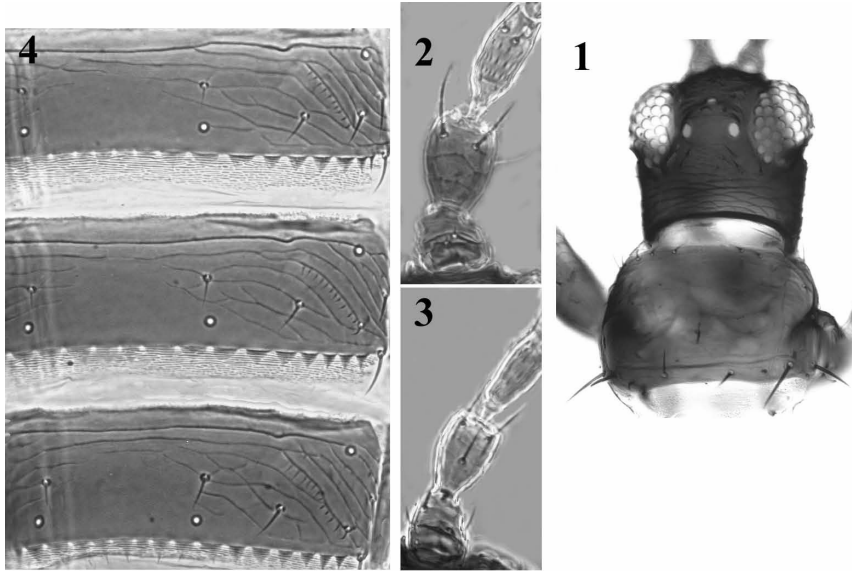
#### Key to genera of *Thrips* group

1. Mesothoracic sternopleural sutures absent; antennal segment II without dorsal seta basad of campaniform sensilla (fig. 2). ..... *Sphaeropothrips*
- Mesothoracic sternopleural sutures present; antennal segment II with dorsal seta basad of campaniform sensilla (fig. 3) ..... **2**
2. Abdominal tergites with a craspedum of large triangular teeth on posterior margin (fig. 4); head unusually small; pronotal posteroangular setae scarcely longer than posteromarginal setae ..... *Microcephalothrips*
- Abdominal tergites without a craspedum; head not unusually small; pronotum with 2 pairs of elongate posteroangular setae ..... **3**
3. The second pair of postocular setae inserted far back of the others; setae S3 to S5 on abdominal tergites III to V arranged in a straight line with S4 posteriad of the level of S5; tergite VIII with comb; antennae 7-segmented..... *Stenothrips*
- The second pair of postocular setae not displaced to the posterior; setae S3 to S5 on abdominal tergites III to V arranged in a triangle with S4 forming the mesial angle; tergite VIII with or without comb antennae 7 or 8-segmented ..... *Thrips*

#### The four genera of *Thrips*-group in Iran

The genus *Thrips* is the most species-rich genus in the order Thysanoptera, with 280 species worldwide (Mound & Masumoto, 2005). In contrast, the three other genera

considered in this paper, *Microcephalothrips*, *Stenothrips* and *Sphaeropothrips*, each have only one species.



**Figures 1-4.** 1. *Sphaeropothrips vittipennis*, head and pronotum, 2. *S. vittipennis*, antennal segments I-III, 3. *Stenothrips graminum*, antennal segments I-III, 4. *Microcephalothrips abdominalis*, abdominal tergites V-VII.

*Microcephalothrips abdominalis* (Crawford DL) is the only species recognised in this genus. Nine synonyms of this species are already established, and three further species that are listed by Mound (2005) from China were distinguished on character states that are known to be variable within individual populations, and these species probably also represent *M. abdominalis*. This thrips breeds particularly in the flowers of sunflowers, *Helianthus annuus*, but also in some other Asteraceae (Moritz *et al.*, 2001). It has been mentioned as a vector of tobacco streak virus (Greber *et al.*, 1991), and recorded in Iran from Golestan, Khuzestan, Markazi and Tehran provinces in various plants including ornamental flowers (Cheraghian & Hojat, 1998; Gilasian *et al.*, 2000; Bagheri *et al.*, 2002; Jalili Moghadam & Azmayesh Fard, 2004; Ghotbi *et al.*, 2005). Adults of this species were also collected recently on Tobacco at

Tirtash Tobacco Research Institute (Mazandaran province) by H. Khateri (personal communication).

*Stenothrips graminum* Uzel, the common European "oat thrips", breeds in *Avena*, *Hordeum* and *Triticum* (all Poaceae) (Priesner, 1965; zur Strassen, 2003). In contrast, Dordaie *et al.*, (2000) report this species (as "*Stenothrips* sp." but presumably the species is *S. graminum* because the genus is monobasic) as an important pest of poplar trees in East-Azarbaidjan province. However, these authors present insufficient data for this remarkable host-association of a grass thrips to be substantiated (see below under discussion). Moreover, *S. graminum* has been recorded by Alavi (2000) (as *Baliothrips graminum*) and Gilasian *et al.*, (2000) from Golestan province.

The genus *Thrips* includes 22 species recorded from Iran (Bhatti *et al.*, 2003). Several of these species are considered crop pests in various parts of the world, such as *T. angusticeps* Uzel, *T. flavus* Schrank, *T. hawaiiensis* (Morgan), *T. meridionalis* Priesner, and *T. tabaci* Lindeman (Moritz *et al.*, 2001). The latter species is well known as the most important pest of onion crops in Iran (Bournier & Couilloud, 1969; Hassanzadeh-Salmasi, 1995), and is a vector of Tosspovirus diseases on some crops around the world (Mound, 2002a). Recently, transmission of cineraria (*Senecio* sp.) isolate of TSWV has been confirmed by *T. tabaci* in Fars province, Iran (Rasoulpour & Izadpanah, 2003), and also some tospoviruses were detected in populations of *T. tabaci* collected from ornamental plants in Tehran and Markazi Provinces (Ghotbi *et al.*, 2003).

## Discussion

The Thysanoptera fauna of Iran contains elements mostly from the western oriental, eastern Ethiopian, and Mediterranean areas, but it also involves Palaearctic and even Holarctic species as well as circum-subtropical ones (zur Strassen, personal communication, 2001). Little is known about the Thysanoptera fauna of Iran, apart from the checklist by Bhatti *et al.*, (2003), and a further dozen species are still not identified. For instance, it was only recently that three genera including three species of spore feeding Thysanoptera, Idolothripinae were recorded in Iran (Minaei & Alich, 2002), although about 700 species in about 80 genera of this group are known in the world (Mound & Palmer, 1983; Mound, 1997). Moreover and most importantly, there is little information on the biology of most species, particularly the host-plants on which they breed. One example is indicated above, where a species considered to breed only on grasses has been reported as a pest of poplar trees

(Dordaie *et al.* 2000), but with no supporting data such as the presence of larvae. Another example from Iran is a recent record of one adult of *Liothrips austriacus* (Karny) from the leaves of *Pistachio atlantica*, with this plant then being recorded as a "new host" for this thrips species (Hasani & Fallahzadeh, 2005). Adult thrips disperse readily and land on many plants that may not be their true hosts, and a host-plant record based on a single winged adult must be treated with caution. Thus it is not possible to assume that rice is a host-plant of *S. vittipennis*, based on the single specimen that we have seen from this plant. However, the natural host-plants of this thrips appear to be species of Cyperaceae and Poaceae in damp places (Priesner, 1965; zur Strassen, 2003), and this suggests that a breeding association with rice is quite possible.

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