Research Article

Two newly recorded species of the tribe Platylabini (Hymenoptera: Ichneumonidae, Ichneumoninae) from Iran

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Abstract: The tribe Platylabini (Hymenoptera: Ichneumonidae, Ichneumoninae) of Alborz, Guilan and Tehran provinces (North central Iran) was taxonomically studied. The specimens were collected using Malaise traps during March to November 2010–2011. Four species were identified including: Apaeleticus bellicosus Wesmael, 1845, Platylabus iridipennis Gravenhorst, 1829, Apaeleticus inimicus (Gravenhorst, 1820) and Linycus exhortator (Fabricius, 1787) of which A. inimicus and L. exhortator are recorded for the first time from Iran. An updated checklist of Platylabini in Iran, as well as diagnostic characters of the newly recorded species is presented.

Keywords: New record, Ichneumoninae, Platylabini, Taxonomy, Iran

Introduction

The Ichneumonidae Latreille, 1802 is the largest family of insects with an estimated number of 60000 species in the world (Aguiar et al., 2013). The Ichneumoninae with almost 4300 known species is the second largest subfamily in the Ichneumonidae (after Cryptinae), and has a worldwide distribution. This subfamily is divided into 15 tribes (Yu et al., 2012), of which tribe Platylabini Berthoumieu, 1904 includes 38 genera worldwide and 16 genera have been recorded from the western Palaearctic region (Tereshkin, 2009; Yu et al., 2012). The species of Platylabini are mainly parasitoids of the Lepidopteran families, Geometridae and Drepanidae. The female parasitoid lays its eggs into the body of lepidopteran larvae (Perkins, 1960; Tereshkin, 2009). Morphological terminology follows Tereshkin (2009). Members of the tribe Platylabini are recognizable by having convex clypeus, widened and dorsally flattened petiolus and amblypygous abdomen (Riedel, 2008; Tereshkin, 2009). In recent years, considerable progress has been made in understanding the taxonomy of different subfamilies of Ichneumonidae in Iran (Barahoei et al., 2012, 2013; Mohammadi-Khoramabadi et al., 2011; 2013a, b; Amiri et al., 2015a, b; 2016 a, b; 2017; Mohebban et al., 2015, 2016). Prior to this study, 10 species of the tribe Platylabini were recorded from Iran (Kolarov and Ghahari, 2008; Ghahari and Jussila, 2010, 2011, 2012; Ghahari and Schwarz, 2012; Ghahari 2014; Ghahari and Gadallah, 2015; Mohebban et al., 2015, 2016). However, many more species presumably exist in Iran to be discovered. The objective of this study as a part of our ongoing research on the Ichneumoninae fauna of Iran is to improve our knowledge of the tribe Platylabini. The results may be useful for future biological control of insect pests and ecological studies.

Materials and Methods

Malaise traps were used in different places including Ghazichak, Eshman Kamachal, Orkom,
Two new records of Ichneumonidae from Iran ________________________________________ J. Crop Prot.

Ziaz located in Guilan province and Arangeh, Sarzariat, Shahrestanak, Karaj in Alborz province and Shahriar in Tehran province during March to November 2010 and 2011. The specimens were treated with a mixture of Alcohol (60%) /Xylene (40%) for two days and with Amyl acetate for the next two days (AXA) and finally placed on the filter paper for drying (van Achterberg, 2009). The dried specimens were then mounted on triangular point cards. Morphological terminology predominantly follows Tereshkin (2009).

Relevant literature were used for the identification of the specimens (Perkins, 1960; Tereshkin, 2009; Riedel, 2008). Illustrations were made using an Olympus™ AX70 microscope and Olympus™ SZX9 stereomicroscope equipped with a Sony™ digital camera. A series of 10–15 captured images were merged into a single in-focus image using the image-stacking software ZereneStacker version 1.04. The specimens are deposited at the Collection of Department of Entomology, Tarbiat Modares University (TMUC), Tehran, Iran, and the personal collection of M. Riedel.

Results

Four species belonging to three genera of the tribe Platylabini were collected and identified, of which two species, e.g. Apaeleticus inimicus (Gravenhorst, 1820) and Linycus exhortator (Fabricius, 1787) are new records for the Iranian fauna. The results of this study and review of the previously recorded taxa documented the existence of 12 species of the tribe Platylabini in Iran.

Apaeleticus bellicosus Wesmael, 1845
Material examined: Iran, Alborz province, Shahrestanak, (35°58′12″ N, 51°21′24″ E, 2225 m a.s.l.), Malaise trap, 09.VIII.2010, 1♀, 18.VIII.2010, 1♀, 22.IX.2010, 1♀; Shahrestanak (35°58′12″ N, 51°21′24″ E, 2225 m a.s.l.), Malaise trap, 09.VIII.2010, 2♀, 18.VIII.2010, 2♀, 24. VIII.2010, 1♀, 22.IX.2010, 1♀; Guilan province, Esham Kamchal (37°22′06″ N, 49°57′ 54″ E, 1 m a.s.l.), Malaise trap, 06.IX.2010, 1♀; Ziaz (36°52′30″ N, 50°13′ 24″ E, 490 m a.s.l.), Malaise trap, 17.V.2010, 1♀, Leg.: M. Khayrandish.

General distribution: Western Palaearctic, Iran (new record).

Morphological characters (female): Body length 5–6mm; vertex from lateral view sharply sloping just after the ocelli (Fig. 1D); temples moderately long, sinuously narrowed behind eyes (Fig. 1A); occipital carina meeting with hypostomal carina at base of mandible (Fig. 1C); face strongly protruding, narrow, in middle narrower than lateral area (Fig. 1B), clypeus transverse, convex and rounded lateral corners; mandibles gradually narrowed to apex; malar space 0.1 times as long as basal width of mandibles; flagellum with 30 segments, white semianulus on segments 6–10 (11), basal flagellomere 2.3 times longer than width at apex; mesonotum moderately convex and scarcely punctuated (Fig. 1A); scutellum slightly convex, laterally carinated up to middle, dorsal surface densely punctured, without microsculpture (Fig. 1E); transverse furrow of pronotum shallow; mesonotum moderately convex, 0.73 times wider than length; notauli distinct almost to middle (Figs. 1A, F); mesopleura very densely punctured, without microsculpture (Fig. 1F); area superomedia hexagonal, 1.4 times wider than length; costulae present; dentiparal area with tooth at apex; propodeal spiracle small, roundish, 2 times longer than width (Fig. 1E); fore wing with pentagonal areolet, rather symmetrical, narrow in front; first tergite without dorsal carinae, its surface punctured (Fig. 1G); gastrocoeli deep; thyridia distinct, very slightly oblique and close to base of tergite, interval wider than thyridia width (Fig. 1G); surface of second and third tergites, densely punctured (Fig. 1I); tergites 6 and 7 hidden extended under 5th tergite and thus
abdomen from above truncated; ovipositor sheath short, almost pointed apically (Fig. 1H).

**Coloration:** Body reddish with ivory pattern; posterior margins of pronotum, spots on propodeum, subalarum and tegula red; post scutellum black; all legs red; tergites 5 and 6 black.

**General distribution:** Western Palaearctic (Yu et al., 2012), Iran (new record).

**Linycus exhortator** (Fabricius, 1787) (Figs. 2A−H)

**Material examined:** Iran, Alborz province, Arangeh (35°55'06" N, 51°05'12" E, 1891 m a.s.l.), Malaise trap, 01.VI.2010, 1♂; Sarziarat (35°55'12" N, 51°06'54" E, 1980 m a.s.l.), Malaise trap, 08.VI.2010, 1♀, 18.VIII.2010, 3♂; Shahr restanak, Malaise trap (35°57'36" N, 51°22'18" E, 2301 m a.s.l.), Malaise trap, 17.V.2010, 2♂; Guilan province, Ghazichak (36°45'54" N, 50° 19' 36" E, 1803 m a.s.l.), Malaise trap, 10.V.2010, 1♀, 24.V.2010, 1♀, 2♂; Orkom (36°45'42" N, 50° 18' 12" E, 1235 m a.s.l.), Malaise trap, 12.IV.2010, 1♀, 24.V.2010, 1♀, 21.VI.2010, 1♀, 19.VII.2010, 1♀; Tehran province, Shahriar (35°40'06" N, 50°56'54" E, 1168 m a.s.l.), Malaise trap, 04.V.2010, 1♀, leg.: M. Khayrandish.

![Figure 1 Apaeleticus inimicus (Gravenhorst, 1820), A) head, dorsal view; B) head, frontal view; C) head, ventral view; D) head, lateral view; E) propodeum, dorsal view; F) mesosoma, lateral view; G) first metasomal tergite, dorsal view; H) metasomal tergites, lateral view; I) metasomal tergites, dorsal view.](image-url)
Figure 2 Linycus exhortator (Fabricius, 1787), A) head, dorsal view; B) head, frontal view; C) head, lateral view; D) mesonotum and scutellum; E) mesosoma, lateral view; F) propodeum, dorsal view; G) metasomal tergite, dorsal view; H) metasomal tergite, lateral view.

Morphological characters (female): Body length 7.1–7.5 mm; middle field of face distinctly, but slightly elevated, narrow, medially 1.5 times narrower than lateral area (Fig. 2B); clypeus with straight front margin, strongly transversal, 2.7 times wider than length, distinctly separated from middle field of face; mandibles gradually and strongly narrowed behind base (Figs. 2B, 2C); temples from above, very strongly roundly narrowed behind eyes (Fig. 2A); malar space approximately 1.5 times shorter than mandible base width; flagellum with 33 segments, strongly and gradually attenuated toward apex, with white semiannulus on segments 5–9; mesonotum strongly convex, of equal length and breadth, notauli sharp, extend behind middle of
mesonotum; (Fig. 2D); scutellum strongly convex, from above triangular, laterally sharply carinated up to apex (Fig. 2D), transverse furrow of pronotum narrow and deep (Fig. 2A); lower part of mesopleura smoothly longitudinally wrinkly-punctured, shining, without microsculpture (Fig. 2E); area superomedia transversal, rounded in front; costulae approximately at its middle (Fig. 2F), propodeal spiracle small, circular; areolet distinctly pentagonal, slightly asymmetrical; hind femur length 3.2 times its maximum width; form of abdomen from above rhomboidal (Fig. 2G); gastrocoeli shallow, distance between gastrocoeli at base equal to width of middle field of postpetiolus; thyridia well developed.

**Coloration:** Head black; most part of body mainly ferruginous; tergites 3–7 darkened, tergites 4–7 with white membranous apex; apices of hind femora, tibiae and tarsi darkened.

**General distribution:** Palaearctic (Yu et al., 2012), Iran (new record).

**Platylabus iridipennis** (Gravenhorst, 1829)

**Material examined:** Iran, Tehran province, Shahriar (35°40′06″ N, 50°56′54″ E, 1168 m a.s.l.), Malaise trap, 04.V.2010, 1♀, leg.: M. Khayrandish.

**General distribution:** Palaearctic (Yu et al., 2012); Iran (Ghahari and Schwarz, 2012; Mohebban et al., 2016).

**Discussion**

Iran is located in the eastern border of western Palaearctic region, at the crossroads between the Palaearctic, Oriental and Afrotropical regions (Firouz, 2005), and thus its fauna includes elements of all three regions. All species that have been recorded in this study have previously been reported from the Palaearctic region. Previous taxonomic studies on other subfamilies of Ichneumonidae in southern Iran has shown that some species found in Iran are same as those distributed in Afrotropical and Oriental regions (Amiri et al., 2015b, 2016a). The distribution and biology of the majority of Iranian Ichneumoninae wasps are not well known (Masnadi-Yazdinejad et al., 2010). The results of this study and review of the previously recorded Platylabini revealed the existence of 12 species belonging to six genera in Iran (Table 1), which comprise a very small record, comparing more than 212 species in the western Palaearctic region (Yu et al., 2012). The number of species of the tribe Platylabini in the adjacent countries of Iran is recorded as: 74 species in former USSR, nine species in Turkey, and one species in Tajikistan. There is no species recorded in Turkmenistan, Armenia and Afghanistan (Yu et al., 2012). Since many areas of Iran remain unexplored, we expect that the Platylabini fauna of Iran will be substantially increased by further research.

**Table 1** Updated checklist of the tribe Platylabini species known in Iran.

<table>
<thead>
<tr>
<th>Species</th>
<th>Distribution in Iran (provinces)</th>
<th>References</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apaeleticus bellicosus</td>
<td>Lorestan, Kerman, Alborz</td>
<td>Gahahi and Gadallah (2015), Mohebban et al., (2015, 2016), Current study</td>
</tr>
<tr>
<td>Apaeleticus inimicus*</td>
<td>Alborz, Guilan</td>
<td>Current study</td>
</tr>
<tr>
<td>Cyclolabus nigricollis</td>
<td>Ardabil, Guilan</td>
<td>Kolarov and Gahahi (2008), Gahahi and Jussila (2010)</td>
</tr>
<tr>
<td>Cyclolabus pactor</td>
<td>Mazandaran</td>
<td>Kolarov and Gahahi (2008)</td>
</tr>
<tr>
<td>Ectopius rubellus</td>
<td>Mazandaran, West Azarbaijan</td>
<td>Kolarov and Gahahi (2008), Gahahi and Jussila (2011)</td>
</tr>
<tr>
<td>Hypomecus quadriannulatus</td>
<td>Khuzestan</td>
<td>Kolarov and Gahahi (2008)</td>
</tr>
<tr>
<td>Linycus exhortator*</td>
<td>Alborz, Guilan, Tehran</td>
<td>Current study</td>
</tr>
<tr>
<td>Platylabus cornicula</td>
<td>Semnan</td>
<td>Kolarov and Gahahi (2008)</td>
</tr>
<tr>
<td>Platylabus heteromalles</td>
<td>East Azarbaijan</td>
<td>Gahahi and Jussila (2010)</td>
</tr>
<tr>
<td>Platylabus iridipennis</td>
<td>Lorestan, Kerman, Qazvin, Tehran</td>
<td>Mohebban et al. (2016), Gahahi and Schwarz (2012), Current study</td>
</tr>
<tr>
<td>Platylabus rufus</td>
<td>Mazandaran</td>
<td>Kolarov and Gahahi (2008)</td>
</tr>
<tr>
<td>Platylabus tricingulatus</td>
<td>Golestan</td>
<td>Kolarov and Gahahi (2008), Tehran (Gahahi, 2014)</td>
</tr>
</tbody>
</table>

* New records for the Iranian insect fauna.
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گزارش جدید دو گونه از قیبله Platylabini از ایران

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چکیده: زنبورهای قیبله Platylabini (Hymenoptera, Ichneumonidae, Ichneumoninae) در استان‌های البرز، گیلان و تهران مورد مطالعه قرار گرفت. نمونه‌ها با استفاده از تله مایزر در طی ماه‌های اسفند تا آبان سال‌های 1389 و 1390 جمع‌آوری شدند. چهار گونه شامل Araeleticus bellicosus Wesmael، 1845، Platylabus iridipennis Gravenhorst، 1829، Araeleticus inimicus (Gravenhorst، 1820) و Linyces exhortator (Fabricius، 1787) و 1820) اسکناسی شامل گونه‌های البوره‌ای Platylabini برای اولین بار از ایران گزارش شده‌اند. لیست مورف‌شناسی افراتای گزارش‌های جدید از ایران ارائه شده است.

واژگان کلیدی: گزارش جدید، تکسنوئومی، ایران.