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Research Article

Study of the genera *Laphria* Meigen, 1803 and *Pogonosoma* Rondani, 1856 (Diptera: Asilidae: Laphriinae) in Iran, with two new species records for the country

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Abstract: The present study deals with the fauna of the genera *Laphria* Meigen, 1803 and *Pogonosoma* Rondani, 1856 in Iran. Specimens were collected, using Malaise traps, from Guilan and Mazandaran provinces during 2010-2012. Overall, four species were identified, of which the two species, *Laphria caspica* Hermann, 1906 and *Pogonosoma unicolor* Loew, 1873 are newly recorded from Iran. The diagnostic characters and supplementary photographs of the newly recorded species are provided.

Keywords: Asilidae, Laphriinae, *Laphria*, *Pogonosoma*, new records

Introduction

Both of the genera *Laphria* Meigen, 1803 and *Pogonosoma* Rondani, 1853 belong to the subfamily Laphriinae, the first to the tribe Laphriini and the second to the tribe Andrenosomatini (Dikow, 2009). In general the larvae of the Asilidae live in the soil, but the species of the tribes Laphriini and Andrenosomatini are an exception, their larvae live in decaying wood where they prey on the larvae of other arthropods. Most species of the tribes Laphriini and Andrenosomatini can be found in woodland areas (Van den Broek and Álvarez Fidalgo, 2016). In Iran the tribe Laphriini are represented by the genera *Choerades* Walker, 1851 and *Laphria* and the tribe Andrenosomatini represented by the genera *Andrenosoma* Rondani, 1856 and *Pogonosoma*. Most species of Laphriini and Andrenosomatini are bee or bumblebee like in appearance. The antennae do not have an obvious arista, but a small sensory element placed in a small cavity at, or near the apex of the postpedicel (Geller-Grimm, 2003a). The proboscis in the species of the Laphriini, is long and laterally flattened, but in the species of the Andrenosomatini, proboscis is shorter, dorsoventrally flattened and apically bent slightly upward (Hull, 1962).

The species of the Andrenosomatini can further be separated from the species of the Laphriini by the well excavated vertex and broad frons with the sharply marked ocellar tubercle (Joseph and Parui, 1998). The males of the genus *Laphria* can be separated from the males of the very similar genus *Choerades* by the presence of thorn like protuberance on the apex of the hind tibia and by the absence of remarkable projections on the hypopygium. In general the species of *Laphria* are bigger and more hairy in appearance than those of the genus *Choerades*. The genus *Pogonosoma* can be separated from the closely related and very similar genus *Andrenosoma* Rondani, 1856, by the presence of

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an extra cross-vein, between R 2 + 3 and R 4, thus creating 3 submarginal cells.

Until now four species of the genus *Laphria* were known from Iran: *Laphria aurea* (Fabricius, 1794), *L. dizonias* Loew, 1847, *L. flava* (L., 1761) and *L. gibbosa* (L., 1758) but only one species of the genus *Pogonosoma* was known, namely *Pogonosoma maroccanum* (Fabricius, 1794) (Abbassian-Lintzen, 1964; Ghahari*et al*., 2007; Hayat *et al*, 2008). The objective of this study is to provide a faunistic contribution to the knowledge about the species of the genera *Laphria* and *Pogonosoma* in northern Iran.

Materials and Methods

All specimens were collected by Malaise traps from Guilan and Mazandaran provinces during 2010-2012. Morphological terminology mainly follows Richter (1988) and Geller-Grimm *et al*. (2015). Illustrations were made using an Olympus TM SZX9 stereomicroscope equipped with a Sony™ digital camera. A series of 4-5 captured images were then merged into a single in-focus image using the image-stacking software Combine ZP 1.0. Data about species, general geographical distributions and distribution in Iranare provided. Diagnostic characters for the new Iranian records are given. All specimens are deposited in the Insect Collection of Department of Entomology, Tarbiat Modares University, Tehran, Iran (TMUC).

Results

In total four species were identified, of which two species *Laphria caspica* Hermann, 1906 and *Pogonosoma unicolor* Loew, 1873 are newly recorded for Iranian fauna.

The list of the studied species from Guilan and Mazandaran provinces

Genus: *Laphria* Meigen, 1803

Type species: *Asilus gibbosus* Linnaeus, 1758

***Laphria aurea* (Fabricius, 1794)**

Material examined: (1♂): Mazandaran province, Tangevaz, 36˚ 21.928' N, 52˚ 06.172' E, 702 m, August 16th 2012.

Distribution in Iran: Mazandaran and Qom provinces (Ghahari *et al*., 2007), East Azerbaijan province (Mohammadi *et al*., 2017), Mazandaran province (current study).

General distribution: Austria, Bulgaria, Czech Republic, France, Greece, Hungary, Israel, Italy, Romania, Russia (South European territory), Slovakia, Turkey, former Yugoslavia (Geller-Grimm *et al*., 2015).

***Laphria caspica* Hermann, 1906**

Material examined: (1♂): Guilan province, Roodsar, Rahim abad, Ghazichak, 36°45.526′ N, 50°20.010′E, 1787m, July 5th 2010; (1♂): Mazandaran province, Tangevaz, 36˚ 21.917' N, 52˚ 06.179' E, 692m, August 16th 2012.

Distribution in Iran: Guilan province (current study), new record for Iran.

General distribution: Transcaucasus, Rumania (Richter, 1988).

Diagnostic characters: Body covered by yellow hairs, admixed with black hairs (Figs 1A, 1E); face has dense pile and short bristles; palpus two segmented; posterior part of mesonotum with long erect hairs (Fig. 1A); upper branch of the R_3 curved; claw normal; all abdominal tergites covered with erect, more or less dense hairs on the lateral sides, more sparse and much shorter in the middle (Fig. 1C); body 18 to 21mm;

***Laphria dizonias* Loew, 1847**

Material examined: (2♀): Guilan province, Roodsar, Rahim abad, Ziaz, 36°52.271′N, 50°13.247′E, 490 m, June 4th 2010.

Distribution in Iran: Fars province (Abbassian-Lintzen, 1964; Saghaei *et al*., 2009; Tomasovic and Saghaei, 2009), Southern Iran (no locality cited) (Abbassian-Lintzen, 1964), Guilan province (current study).

General distribution: Armenia, Azerbaijan, Greece, Iraq, Israel, Turkey (Hayat *et al*., 2008).

Identification key for *Laphria* Meigen, 1803 species, known from Iran (adapted from Richter, 1988 and Lehr, 1989)

1a- Abdominal tergites covered with dpressed hairs……..……...…..**2**

1b- Abdominal tergites covered with erect hairs (Figs. 1A, 1C, 1D)…….....**3**

2a- Tergites 4-5 covered with yellow hairs; all other tergites covered with reddish hairs; body length 20-28mm……..…....***L. dizonias*** **Loew**
2b- Abdominal tergites 1-3 and anterior part of tergite 4 covered with reddish brown hairs, rest of tergite 4 and all following tergites covered with dense yellow hair. Body length 17-29 mm……..……..***L. aurea*** **(Fabricius)**
3a- Abdominal tergites 1-3 covered with dense, erect black hairs, tergites 4-6 covered with dense, dpressed light yellow or white hairs; body length 15-28 mm..... ***L. gibbosa*** **(L.)**
3b- Abdominal tergites more or less covered with dense, erect yellow hairs (Figs. 1A, 1C, 1D)……..**4**
4a- Hairs along the median line of all abdominal tergites sparse and short; body length 18-21mm (Figs. 1A, B, C, D)…….... ***L. caspica*** **Hermann**
4b- Hairs on abdominal tergites more or less of equal length; body length 12-24mm.…***L. flava*** **(L.)**

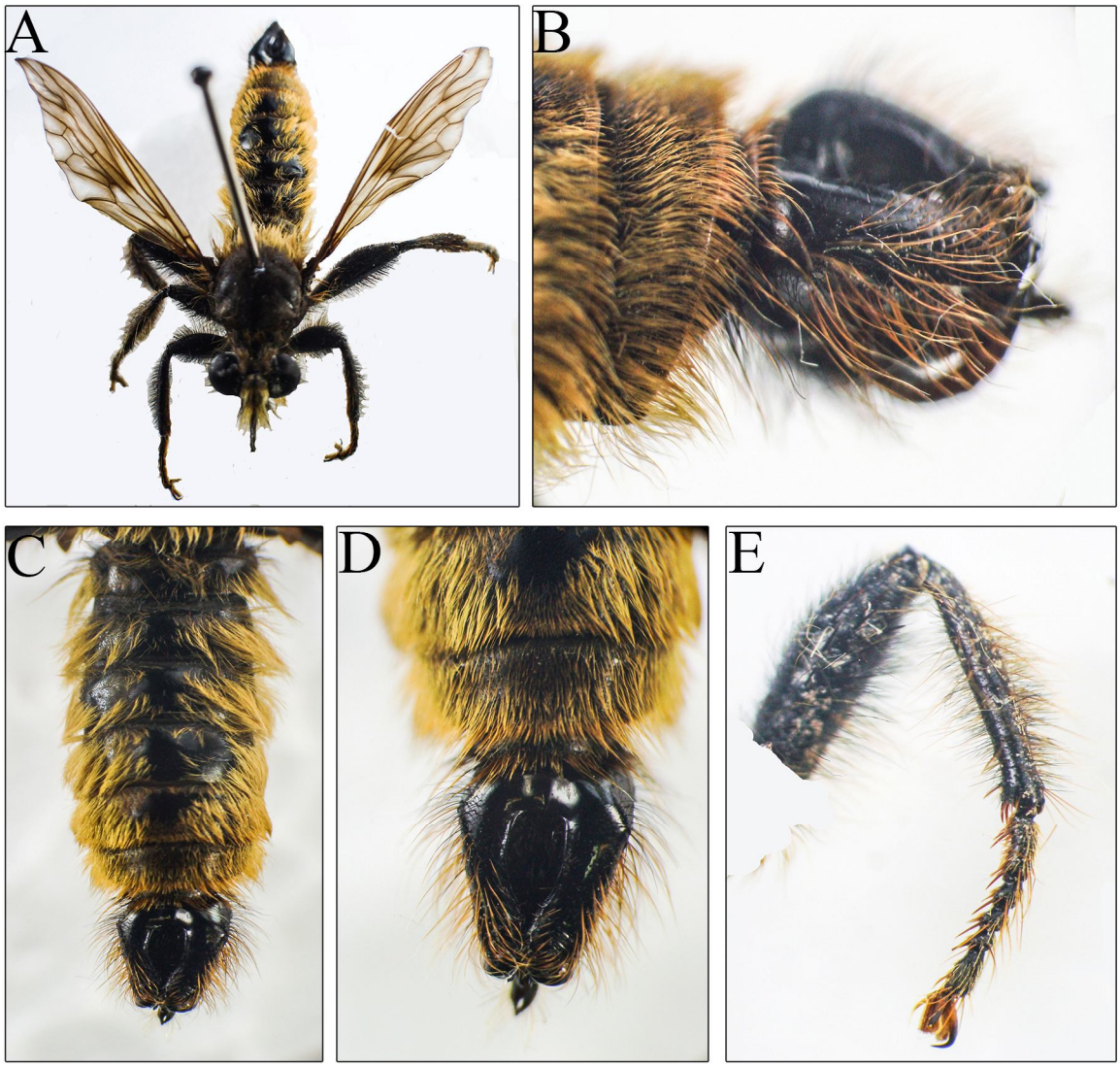

Figure 1 *Laphria caspica* Hermann, 1906, A-E: Male. A: general habitus, dorsal view; B:genitalia, lateral view; C: abdomen, dorsal view; D: genitalia, dorsal view; E: leg, lateral view.

Genus: *Pogonosoma* Rondani, 1856
Type species: *Asilus maroccanus* Fabricius, 1794
***Pogonosoma unicolor* Loew, 1873**
Material examined: (1♀): Guilan province, Roodsar, Rahim abad, Orkom, 36°45.443′N, 50°18.118′ E, 1201 m, August 16th 2010.
Distribution in Iran: Guilan province (current study), new record for Iran.
General distribution: Transcaucasus (Geller-Grimm *et al*., 2015).
Diagnostic characters: Glossy black species (Figs. 2A, 2B); hairs of body mostly white, otherwise black (Fig. 2C); third antennal segment without any long style; marginal cell closed and with a short stem (Figs. 2A, 2D); ambient vein entire, and the other veins reaching the wing margin; submarginal cells three (Fig. 2D); first posterior cell always long and narrow (Fig. 2D), sometimes closed in the male.

Identification key for *Pogonosoma* Rondani, 1856 species known from Iran (adapted from Richter, 1988 and Lehr, 1989)

1a- Tibia and tarsi yellow; body length 18-25mm…… ……..***P. maroccanum* (Fabricius)**
1b-Legs entirely back; body length 16-18mm (Figs. 2A, 2B, 2C)…… ..***P. unicolor* Loew**

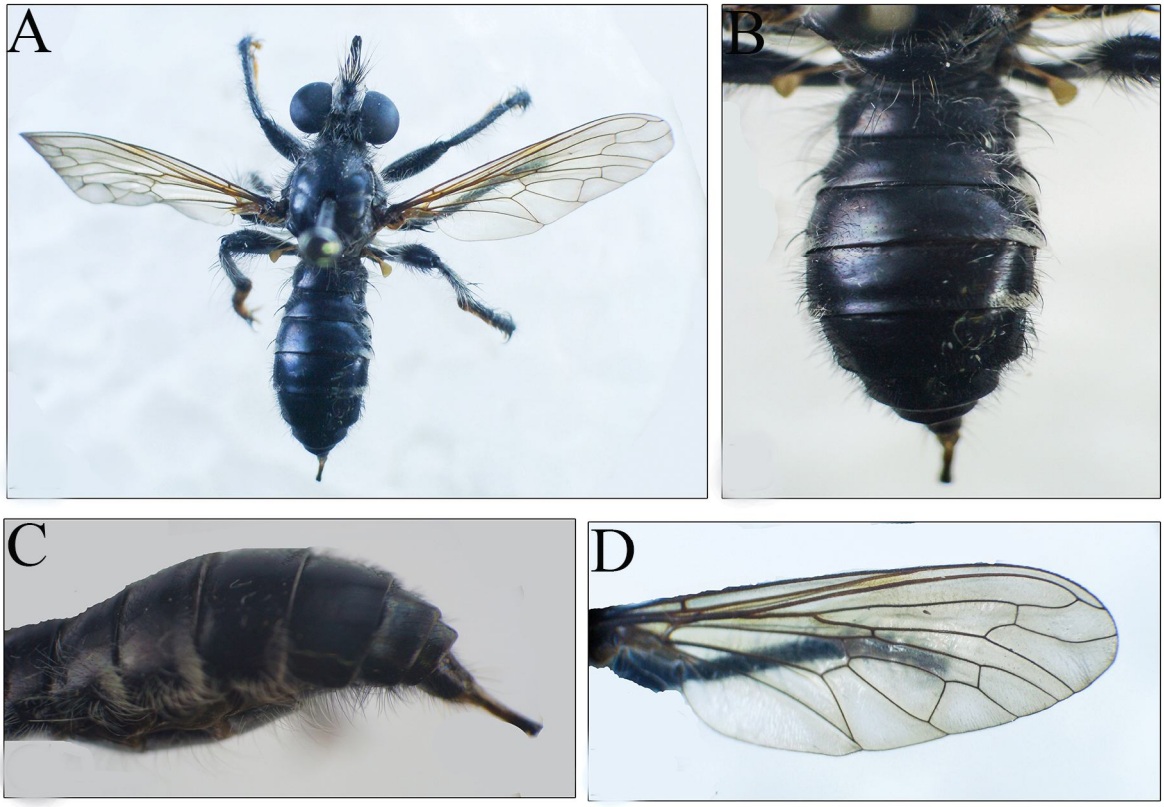

Figure 2 *Pogonosoma unicolor* Loew, 1873, A-D: Female. A: general habitus, dorsal view; B: abdomen, dorsal view; C: abdomen, lateral view; D: wing.

Discussion

During this study, two species *Laphria caspica* Hermann, 1906 and *Pogonosoma unicolor* Loew, 1873 were discovered from the Guilan province, which are new for the fauna of Iran. Also, *Laphria dizonias* Loew, 1847 is recorded for the first time from Guilan province. The genus *Laphria* with more than 247 species, is one of the largest genera in the subfamily

Laphriinae but *Pogonosoma* with 18 species, is a small genus in this subfamily (Geller-Grimm, 2003b; Geller-Grimm *et al*., 2015). Before this study, Abbassian-Lintzen (1964) recorded *Laphria dizonias* Loew, 1847 from Fars province. Ghahari *et al*. (2007) recorded *L. aurea* (Fabricius, 1794), *L. gibbosa* (Linnaeus, 1758) and *Pogonosoma maroccanum* (Fabricius, 1794) from Khorasan, Mazandaran, Semnan, Qom and Yazd provinces. Later, Hayat *et al*. (2008) recorded *Laphria flava* (Linnaeus, 1761) from Mazandaran province. Iran is a vast country with different biogeographical areas, because of that and the fact that the Asilidae were not studied intensively it may be expected that more species of the subfamily Laphriinae, especially genera *Laphria*, and *Pogonosoma*, may be discovered. The present paper increases the faunal list of genus *Laphria* to 5 and genus *Pogonosoma* to 2 species from Iran.

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مطالعه جنس‌های *Laphria* Meigen, 1803 و Pogonosoma Rondani, 1856 (Diptera: Asilidae: Laphriinae) در ایران، به‌همراه دو رکورد جدید برای کشور

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چکیده: مطالعه حاضر به‌منظور بررسی دو جنس *Laphria* Meigen, 1803 و *Pogonosoma* Rondani, 1856 در ایران انجام شد. نمونه‌برداری در طی سال‌های ۲۰۱۲-۲۰۱۰ و با استفاده از تله‌ی مالیز در استان‌های گیلان و مازندران انجام شد. در مجموع، چهار گونه شناسایی شد که دو گونه از آنها با نام‌های *Laphria caspica* Hermann, 1906 و *Pogonosoma unicolor* Loew, 1873 برای اولین بار از ایران گزارش می‌شوند. ویژگی‌های افتراقی و عکس‌های تکمیلی از رکوردهای جدید برای ایران ارائه شده است.

واژگان کلیدی: Asilidae، Laphriinae، *Laphria*، *Pogonosoma*، گزارش جدید