

### **Research Article**

# Two new records of the genus *Exoprosopa* (Diptera: Bombyliidae: Anthracinae) from Iran

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Abstract: The genus *Exoprosopa* Macqurt, 1840 (Diptera: Bombyliidae: Anthracinae) was studied in the north central Iran. Four species of the genus *Exoprosopa* were identified of which *E. minos* (Meigen,1804) and *E. grandis* (Pallas, 1818) were previously recorded from northern parts of Iran ( or north of Iran ) and two species namely *E. efflatounbeyi* Paramonov, 1928 and *E. altaica* Paramonov, 1925 are newly recorded from Iran. A key to the species in north central Iran is provided. Morphological diagnostic characters and geographical distribution of the collected species are briefly discussed.

Keywords: Diptera, Bombyliidae, Exoprosopa, new records, Iran

### Introduction

Bombyliidae, commonly known as bombiliids or bee flies, is a large family with more than 4600 known species in 230 genera worldwide (Evenhuis and Greathead, 1999; Hull, 1973). The genus Exoprosopa Macqurt, 1840, belonging to the tribe Exoprosopini and subfamily Anthracinae, includes 70 described species in the Palaearctic region (Evenhuis and Greathead, 1999). The species of this genus characterized by the following morphological features: postcranium with deep or shallow troughs around divided occipital foramen; eyes with bisecting line; cross vein rm at or before middle of discal cell, R<sub>2 + 3</sub> arising from a right angle between the origin of Rs and r-m cross vein, R<sub>2 + 3</sub> arising

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opposite to r-m cross vein or close to it, wing with  $r_1$ - $r_2$  + 3 present but  $r_4$ - $r_5$  absent (3) submarginal cells), face projecting, wing pattern differing or almost completely hyaline, R<sub>5</sub> cell open, antennae with scape and pedicel quadrate and of similar width, flagellum elongate, body and vestiture with different color, hind tibia with small scale laying flat (Greathead and Evenhuis, 1997). Twenty three species of this genus have previously been recorded from Iran (Evenhuis and Greathead, Although, several faunistic taxonomic studies have been carried out on the Bombyliidae in Iran (Linder, 1975; Evenhuis and Greathead, 1999; Gharali, 2010; Gharali et al., 2010; Karimpour, 2012; Hakimian et al., 2012a, b, c; Hakimian et al., 2013a, b) the fauna of Anthracinae need more investigations in the country.

The objective of this study is to provide an initial taxonomic and faunistic insight into species belonging to the genus *Exoprosopa* in steppes, shrublands and forests of north central Iran.

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### **Materials and Methods**

Materials for this study were collected from some parts of north central Iran using Malaise traps (Fig. 1). Sampling was performed during March to November of 2010-2011. Specimens were dehydrated with 99.6% ethanol for 5-10 minutes and then placed in a pure solution of hexamethyldisilazane (HMDS) for 15-20 minutes (Brown, 1993). The specimens were finally placed in a glass plate for drying. The dried specimens were then labeled. Photographs were taken by using the Olympus SZX9 stereomicroscope equipped with a Sony CCD digital camera. Morphological terminology follows Greathead and Evenhuis (1997) and Paramonov (1928). All specimens are deposited in the insect collection of the Department of Entomology, Tarbiat Modares University, Tehran, Iran.

### **Results**

Four species of the genus *Exoprosopa* including *E. efflatounbeyi*, *E. altaica*, *E. minos* and *E.* 

grandis were collected and identified from the studied area. Two species namely *E. efflatounbeyi* and *E. altaica* are new records for the fauna of Iran.

# Key to species of the genus *Exoprosopa* collected in this study



**Figure 1** Northern Iran where *Exoprosopa* specimens were collected.

- Wing with mottled pattern (Fig 2D)......Exoprosopa altaica Paramonov, 1925

*Exoprosopa minos* (Meigen, 1804) (Figs. 2A & 3A)

Anthrax minos Meigen, 1804: 207.

Material examined: IRAN, Gilan province, Rahim abad, 36°45′N, 50°20′E, 1787 m.a.s.l., 03.viii.2010, (1 $\updownarrow$ ), 10.viii.2010, (1 $\circlearrowleft$ ); Qazvin province, Zereshk road, 36°25′N, 50°06′E, 1926 m.a.s.l., 29.vi.2011, (1 $\updownarrow$ ). Leg. M. Khayrandish.

**General distribution:** Western Palaearctic (Mediterranean, Central Asia) (Evenhuis and Greathead, 1999).

Diagnosis: Head (Fig. 3A): occiput black covered with white and yellow scales, frons black, covered with black hairs; antenna black, scape rectangular, covered with black hairs in lateral margin, about 3.5 times as long as pedicel, pedicel globular, covered black hairs marginally, flagellomere about 1.5 times as long as scape, second flagellomere dark brown, with styli; face conically produced, covered with yellow scales, proboscis as long as head. Thorax (Fig. 3A): black, covered with yellow hairs and scales and long black hairs in hind margin; scutellum (Fig. 3A) brown, ½ basal margin black, covered with yellow hairs and scales and long black hairs in hind margin; legs black, covered with white scales and black spines. Wing (Fig. 2A): transparent, c, sc, br and r<sub>5</sub> cells brown; Halter pale brown. Abdomen (Fig. 3A): black, first tergite with two brown spots laterally, tergites covered with pale yellow, black and pale brown hairs and scales, sternites covered with white hairs and scales.

Exoprosopa grandis (Pallas, 1818) (Figs. 2B & 3B)

Anthrax grandis Pallas in Wiedemann, 1818a: 10. Nomen nudum.

Material examined: IRAN, Alborz province, Shahrestanak, 35°57′N, 51°22′E, 2305 m.a.s.l., 20.vii.2010, (1♀). Leg. M. Khayrandish.

General distribution: Western Palaearctic (Mediterranean, Central Asia), Iran (province not defined) (Evenhuis and Greathead, 1999).

Diagnosis: Head (Fig. 3B): occiput black covered with dense yellow scales, frons yellow, covered with dense yellow scales and scattered black hairs, face yellow, covered with scattered black hairs; scape yellow, covered with scattered black hairs, pedicel cylindrical, covered with black hairs, flagellum long conical, about 3 times the length of pedicel, without styli, proboscis as long as head. Thorax (Fig. 3B): mesonotum black, covered with dense yellow hairs and scales in anterior margin; scutellum (Fig. 3B) reddish brown, covered with scattered yellow scales; trochanter covered with dense yellow scales, claws without empodia. Wing (Fig. 2B): with two dark longitudinal stripes, basal stripe from costal vein to anal cell, apical stripe from costal cell to m2 cell, bm and br cells transparent except apically brown; halter apically yellow, basally brown. Abdomen (Fig. 3B): black, anterior margin of all tergites covered with dense yellow scales, posterior margin of all tergites covered with black scales, posterior margin of fifth to seventh tergites covered with black hairs.

Exoprosopa efflatounbeyi Paramonov, 1928 (Figs. 2C & 3C)

*Exoprosopa efflatounbeyi* Paramonov, 1928a: 226 (48)

**Material examined:** IRAN, Tehran province, Shahriar, 35°40′N, 50°56′E, 1168 m.a.s.l., 15.vi.2010, (1♀). Leg. M. Khayrandish.

**General distribution:** South western Palearctic (Southwest Asia) and Northeastern Afrotropical (Evenhuis and Greathead, 1999). New record for Iran.

**Diagnosis: Head** (Fig. 3C): occiput black covered with yellow scales and black hairs, frons pale brown, covered with pale brown scales and black hairs, face conical, brown, covered with white scales and black hairs; scape brown, covered with scattered black

hairs, about 3 times of pedicel in length, pedicel black, covered with black hairs, flagellum 2-segmented, first flagellar segment about 1.5 times longer than scape, second flagellar segment half the length of scape; proboscis as long as head. **Thorax** (Fig. 3C): front margin covered with long yellowish brown hairs, lateral margin covered with brownish yellow and black scales and long hairs, covered black mesonotum vellowish brown to black scales and black hairs, sterna covered with brownish yellow and black hairs; scutellum (Fig. 3C) reddish brown, covered with scattered yellow scales; legs dark brown, femur covered with vellowish brown and black scales and scattered black thorn, tibia and tarsus covered with black scales. Wing (Fig. 2C): with a transparent spot in middle of the discal cell and middle of the bm cell, wing tip transparent at R<sub>4+5</sub> and R<sub>4</sub> cells; halter dark brown, apex with yellow spot. Abdomen (Fig. 3C): sterna pale brown, covered with yellow hairs, terga dark brown, latral and hind margins pale brown, lateral sides of first abdominal segments covered by dense brownish yellow hairs, latral sides of all tergits covered with dense black hairs, tergits covered with yellow and black scales and black hairs.

Exoprosopa altaica Paramonov, 1925 (Figs. 2D & 3D)

Exoprosopa altaica Paramonov, 1925a: 46.

**Material examined:** IRAN, Qazvin province, Zereshk road,  $36^{\circ}25'$  N,  $50^{\circ}06'$  E, 1926 m.a.s.l, 27.vii.2011, (12); 03.viii.2011, (13); Gilan province, Ghazi chack,  $36^{\circ}45'$  N,  $50^{\circ}19'$  E, 1803 m.a.s.l, 05.vii.2010, (13); Leg. M. Khayrandish.

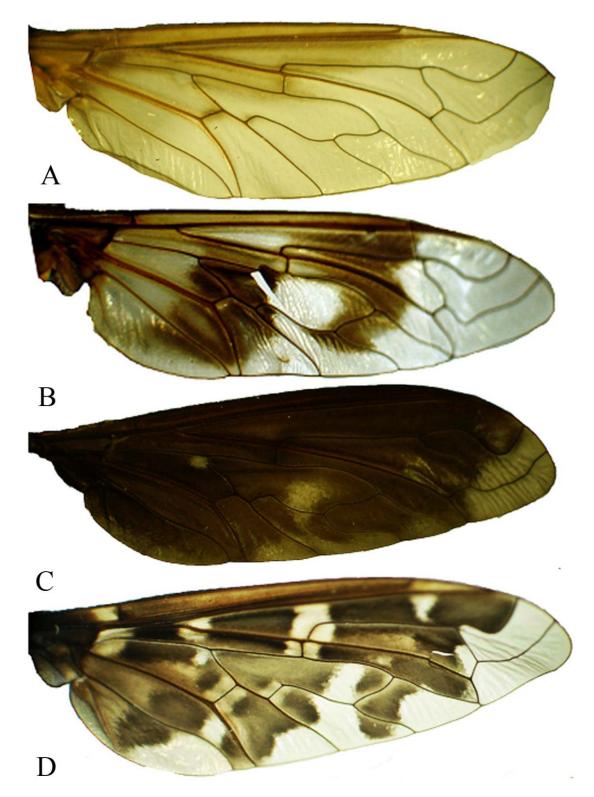
**General distribution:** Central Asia (Evenhuis and Greathead, 1999). New record for Iran.

**Diagnosis: Head** (Fig. 3D): occiput black, covered with white and pale yellow scales and black hairs, frons black, covered with black scales and black hairs, face conically produced, black; antenna black, scape brown, about 1.5 times of pedicel in length,

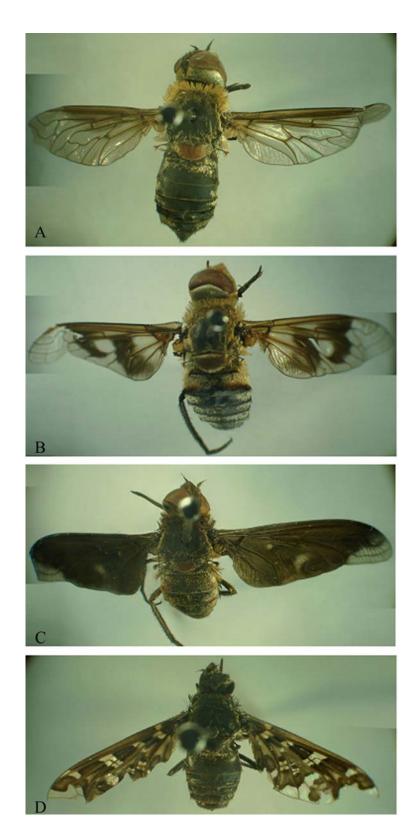
lateral margins with black hairs, first flagellomere about 2 times longer than scape, second flagellomere half the length of the first flagellomere, second flagellomere with styli, proboscis as long as head. Thorax (Fig. 3D): black, front and hind margins covered with black hairs and pale yellow scales, scutellum black, hind margins brown, covered by pale yellow and black scale and black hairs; legs black, covered with black and brown scales and scattered black hairs. Wing (Fig. 2D): black, with transparent spots in discal cell costal cell, m<sub>2</sub> m<sub>1</sub> cup cells, at cross veins, two transparent spots in R<sub>2+3</sub> cell, R<sub>4</sub> cell transparent; halter black. Abdomen (Fig. 3D): tergites black, covered with pale yellow, brown and black scales and black hairs, sternites covered with black hairs.

### **Discussion**

The genus Exoprosopa has been reported from tropical, temperate and Mediterranean climates (Evenhuis and Greathead, 1999). The samples in the current study were also collected from temperate areas in north central Iran in late June to August. With respect to the current study, the number of Iranian species of the genus Exoprosopa increases to 25 species. Twelve species of genus have been recorded from Afghanistan (Evenhuis and Greathead, 1999) and eighteen species from Egypt (El-hawagry and Evenhuis, 2008; Evenhuis and Greathead, 1999). Most of the previously recorded species in Iran were from southern parts of Iran (Evenhuis and Greathead, 1999) which were not within the scope of our study. We did not include these species in the key because they were not accessible to us and their morphological characters were not checked. Since Iran has various geographical regions and climates, it would be expected that many additional species remain to be discovered in Iran.



**Figure 2** Wing color and venation patterns of *Exoprosopa* species; A) *E. minos*, B) *E. grandis*, C) *E. efflatounbeyi*, D) *E. altaica*.



**Figure 3** General habitus of *Exoprosopa* species (dorsal view); A) *E. minos*, B) *E. grandis*, C) *E. efflatounbeyi*, D) *E. altaica*.

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### اولين گزارش دو گونه از جنس (Exoprosopa (Diptera: Bombyliidae: Anthracinae) از ايران

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چكيده: جنس (Diptera: Bombyliidae: Anthracinae) در شمال مركزى ايران مورد مطالعه قرار گرفت. از اين جنس چهار گونه شناسايی شد كه دو گونهی E. minos و (Meigen,1804) و (Meigen,1804) قبلا از ايران گزارش شدهاند ولی دو گونه (Pallas, 1818) و Paramonov, 1928 و E. altaica Paramonov, 1925 برای اولين بار از ايران گزارش می شوند. كليد شناسايی گونهها در منطقه مورد مطالعه ارائه شده است. خصوصيات ظاهری و دامنه پراكنش چهار گونه شناسايی شده در تحقيق حاضر تهيه شده است.

واژگان کلیدی: Exoprosopa ،Bombyliidae ،Diptera، گزارشهای جدید، ایران