

Research Article

## Contribution to the knowledge of Iranian Opiinae (Hymenoptera: Braconidae) with four new records

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**Abstract:** A survey on the fauna of Opiinae (Hymenoptera: Braconidae) was conducted in the north-central region (2010-2011) and Khuzestan Province, southwestern Iran (2016–2017). Specimens were collected using Malaise traps, leading to the identification of 32 species. Among these, *Apodesmia ocellata* (Wesmael, 1835), *Opiostomus (Opiostomus) griffithsi* (Fischer, 1962), and *Xynobius (Xynobius) comatus* (Wesmael, 1835) and *Psytalia (Psytalia) romani* (Fahringer, 1935) are recorded for the first time in Iran. Furthermore, twenty species are reported as new provincial records. A brief diagnosis accompanied by illustrations is provided for these new records in Iran.

**Keywords:** Opiinae, parasitoid, taxonomy, new records, distribution, Iran

### Introduction

The Opiinae Blanchard, 1845 is one of the largest and most complex subfamilies among braconid wasps. To date, approximately 39 genera and 2,060 species have been described within this subfamily (Yu *et al.*, 2016; Wu *et al.*, 2018). In the early twentieth century, most research on Opiinae relied on Gahan's conservative classification (Gahan, 1915), where most species were grouped under the genus *Opius* Wesmael.

A series of studies initiated by Fischer in 1957 significantly expanded our understanding of Opiinae diversity. His work culminated in three comprehensive monographs (Fischer, 1972, 1977, 1987), which provided a detailed classification of the subfamily Opiinae. Fischer's generic divisions were critically

revised by Wharton and Marsh (1978), Wharton (1987), and Wharton and van Achterberg (2000), leading to several modifications. Notably, Wharton elevated *Psytalia* Walker and *Utetes* Förster to generic rank in his revisions (Wharton, 1987). The genus *Opius* Wesmael remains the largest within Opiinae, comprising over 1,282 described species (Fisher 1972, 1977, 1987; Wharton, 1987, 1988; van Achterberg, 1997; Yu *et al.*, 2016).

Species within the subfamily Opiinae are endoparasitoids of cyclorrapha (Diptera) larvae and play a crucial role in controlling dipterous pests such as fruit-flies (Tephritidae) and leaf-mining flies (Agromyzidae) (Li *et al.*, 2012).

Intensive studies on various braconid subfamilies outlined in Iran around since 2008 (Rakhshani *et al.*, 2008, 2012; Ameri *et al.*, 2013, 2014, 2015; Farahani *et al.*, 2014, 2015,

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Handling Editor: Ehsan Rakhshani

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Received: 01 February 2025, Accepted: 09 April 2025

Published online: 09 April 2025

2016; Zargar *et al.*, 2014, 2015, 2019 a-e, 2020; Ranjbar *et al.*, 2016; Ghafouri *et al.*, 2018; Abdoli *et al.*, 2019 a, b, 2024; Pourhaji *et al.*, 2022). This research forms part of ongoing publications by authors on Iranian Opiinae alongside other researchers (Ghahari and van Achterberg, 2016; Gadallah *et al.*, 2016; Safahani *et al.*, 2018; Peris-Felipo *et al.*, 2018; Dolati *et al.*, 2018, 2019, 2021). This study provides detailed distributional data for 32 species and diagnostic characters for newly recorded species in Iran.

## Materials and Methods

This study was conducted in the North-central area of Iran encompassing Alborz, Guilan, Mazandaran, Qazvin and Tehran provinces from March to November 2010 and 2011. Additional sampling was conducted in southwestern Iran's, Khuzestan Province between March 2016 and July 2017. Specimens were collected using Malaise traps across various ecosystems. The specimens were preserved in 75% ethanol, processed according to van Achterberg (2009), and then mounted and labeled. Images were captured with an Olympus SZX9 stereomicroscope equipped with a Canon (EOS 550D) digital camera. A series of four to five pictures stacked into a single focused image using Helicon Focus 7 software. Morphological terminology follows Karlsson and Ronquist (2012) and Wharton (2006). Identification of the specimens was made using the keys provided by Fischer (1972), Papp (1978), Tobias and Jakimavicius (1986) and van Achterberg (1997). All specimens are deposited in the Insect Collection of the Department of Entomology, Tarbiat Modares University, Tehran, Iran (TMUC).

## Results

### Order Hymenoptera Linnaeus, 1758

### Family Braconidae Nees von Esenbeck, 1811

### Subfamily Opiinae Blanchard, 1845

### Genus *Apodesmia* Foerster, 1863

### *Apodesmia irregularis* (Wesmael, 1835)

**Material examined:** Iran, Khuzestan province: Behbahan, Dodangeh, (30°42'08.38" N, 50°10'41.81" E, 300 m a.s.l.), 5.V.2017, 1 ♀; Lali, Taraz, (32°20'49.70" N, 49°05'11.31" E, 390 m a.s.l.), 5.III.2017, 3 ♀, leg.: M. Zargar.

**Distribution in Iran:** Lorestan (Farahani *et al.*, 2016), Khuzestan (current study).

**General distribution:** Eastern and Western Palaearctic, Europe, Nearctic (Yu *et al.*, 2016).

### *Apodesmia ocellata* (Wesmael, 1835)

#### Figs. 1(A-I), 2

**Material examined:** Iran, Mazandaran province: Joorband (36°26'17.28" N, 52°07'16.62" E, 272 m a. s. l.), 26.IX.2011, 1 ♀; Mazandaran province: Tangehvaz (36°21'55.02" N, 52°06'10.74" E, 692 m a. s. l.), 11.X.2011, 2 ♀, leg.: M. Khayrandish.

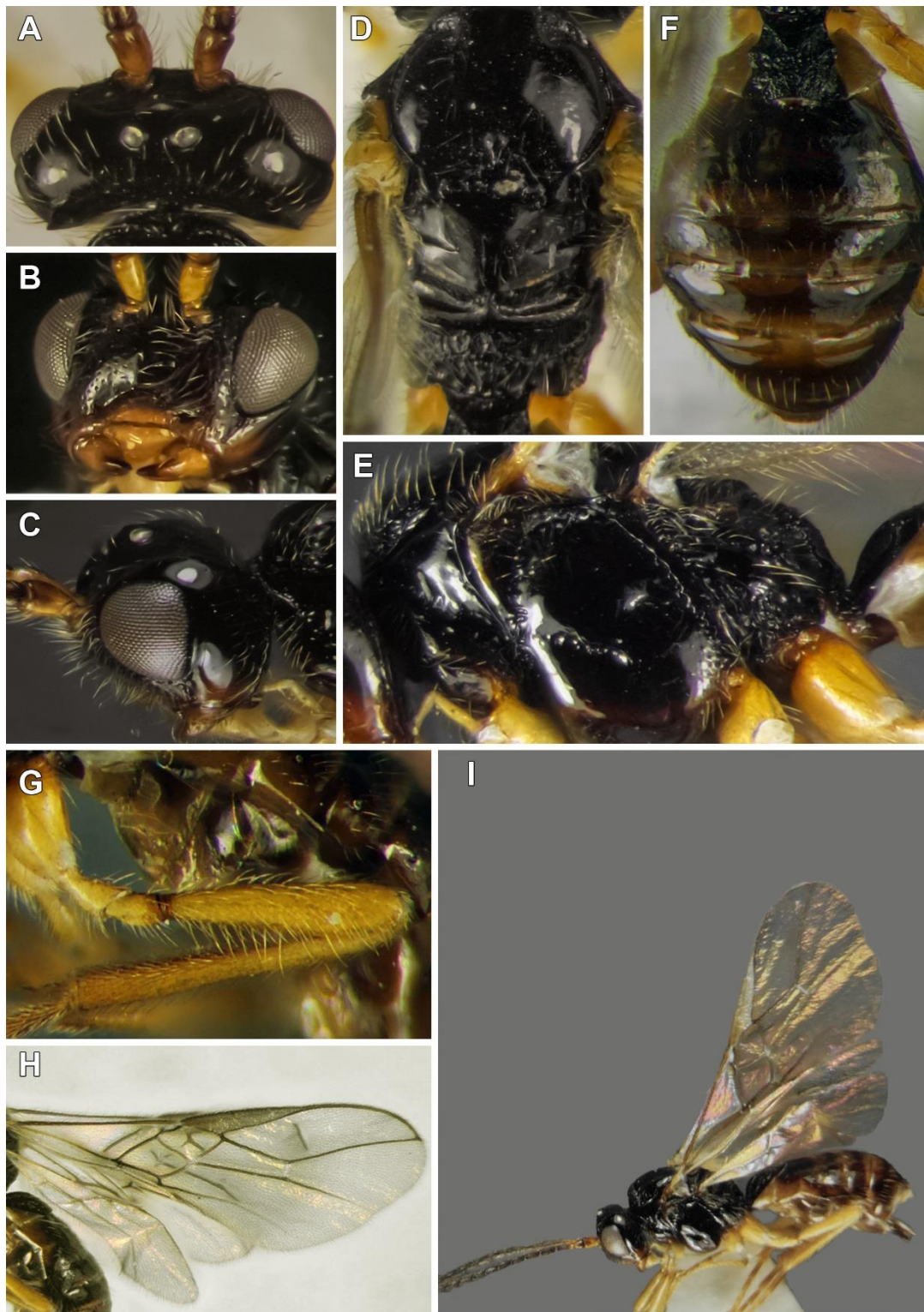
**Diagnosis (Female):** Antennae somewhat longer than the body, with 33-34 antennomeres; oral cavity developed, mouthparts light colored (Fig. 1B); mesonotum with medio-posterior mesoscutal depression (Fig. 1D); notauli not reaching to medio-posterior mesoscutal depression (Fig. 1D); scutellum smooth (Fig. 1D); mesepimeral sulcus on posterior margin of mesopleuron sculptured (Fig. 1E); precoxal sulcus sculptured (Fig. 1E); pterostigma narrow, cuneate, r vein originating distinctly anterior to its middle, 3RSa vein longer than 2RS vein, m-cu vein interstitial (Fig. 1H); legs monochromatic, yellow or dark brownish (Fig. 1G); propodeum coarsely rugose (Fig. 1D); second metasomal tergite smooth (Fig. 1F); body length 3.0-3.2 mm (Fig. 1I).

**Distribution in Iran:** Mazandaran (current study).

**General distribution:** Eastern and Western Palaearctic, Europe (Yu *et al.*, 2016), Iran (**new record**) (Fig. 2).

### *Apodesmia saeva* (Haliday, 1837)

**Material examined:** Iran, Guilan province: Ziaz (36°52'34.44" N, 50°13'17.40" E, 537 m a. s. l.), 10.V.2010, 1 ♀; Mazandaran province: Joorband (36°26'15.54" N, 52°07'13.50" E, 275 m a. s. l.), 12.IV.2011, 1 ♀, leg.: M. Khayrandish.



**Figure 1** *Apodesmia ocellata* (Wesmael, 1835): A. Head, dorsal view; B. Head, frontal view; C. Head, lateral view; D. Mesosoma, dorsal view; E. Mesosoma, lateral view; F. Metasoma, dorsal view. G. Hind leg; H. Wings; I. Habitus, lateral view.



**Figure 2** Global distribution map of *Apodesmia ocellata* (Wesmael, 1835) (Hymenoptera: Braconidae, Opiinae).

**Distribution in Iran:** Mazandaran (Dolati *et al.*, 2019; current study), Guilan (current study).

**General distribution:** Eastern and Western Palearctic, Europe (Yu *et al.*, 2016).

#### *Apodesmia striatula* (Fischer, 1957)

**Material examined:** Iran, Mazandaran province: Gaznasara (36°16'58.08" N, 52°10'55.62" E, 2013 m a. s. l.), 11.V.2011, 1♀; Guilan province: Orkom (36°45'44.34" N, 50°18'11.88" E, 1201 m a. s. l.), 17.V.2010, 1♀, leg.: M. Khayrandish.

**Distribution in Iran:** Guilan (Dolati *et al.*, 2021; current study), Mazandaran (current study).

**General distribution:** Eastern and Western Palearctic, Europe (Yu *et al.*, 2016).

#### Genus *Biosteres* Foerster, 1863

##### *Biosteres haemorrhoeus* (Haliday, 1837)

**Material examined:** Iran, Alborz province: Sarziarat (35°55'10.38" N, 51°06'51.24" E, 1980 m a. s. l.), 08.VI.2011, 1♀, leg.: M. Khayrandish.

**Distribution in Iran:** West Azarbaijan, Guilan (Farahani *et al.*, 2016), East Azarbaijan (Ghahari and van Achterberg, 2016), Alborz (current study).

**General distribution:** Eastern and Western Palearctic, Europe, Nearctic (Yu *et al.*, 2016).

#### Genus *Opiostomus* Fischer, 1972

##### *Opiostomus griffithsi* (Fischer, 1962)

#### Figs 3(A-I), 4

**Material examined:** Iran, Qazvin province: Loshan (36°40'09.12" N, 49°25'37.74" E, 291 m a. s. l.), 07.VI.2011, 1♀, leg.: M. Khayrandish.

**Diagnosis (Female):** Temple somewhat shorter than longitudinal diameter of eye (Fig. 3A); oral cavity not developed (Fig. 3B); mandibles abruptly widened basally (Fig. 3B); mesonotum with medio-posterior mesoscutal depression (Fig. 3D); precoxal sulcus sculptured (Fig. 3E); pterostigma cuneate, r vein originating from its basal third, 3RSa vein longer than 2RS vein, 3RSb vein 2.0 × as long as 3RSa vein, 3RSb vein not reaching wing apex (Fig. 3H); length of hind femur 5.0 × its maximum width in middle part (Fig. 3G); propodeum softly rugose (Fig. 3D); first metasomal tergite as long as its width at apex (Fig. 3F); ovipositor short (Fig. 3F); body length 2.1 mm (Fig. 3I).

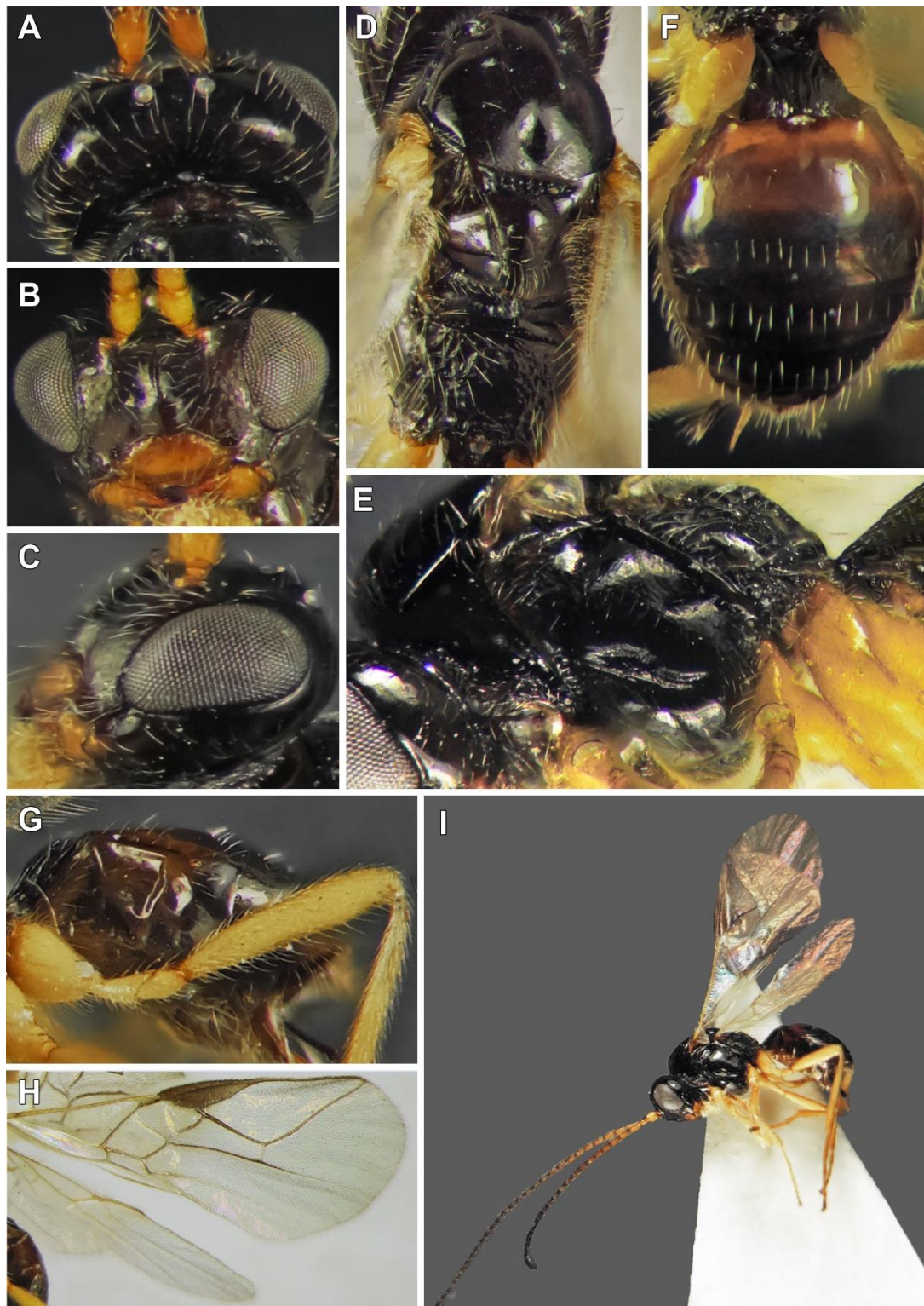
**Distribution in Iran:** Qazvin (current study).

**General distribution:** Europe, Western Palearctic (Yu *et al.*, 2016), Iran (**new record**) (Fig. 4).

#### Genus *Opius* Wesmael, 1835

##### *Opius bouceki* Fischer, 1958

**Material examined:** Iran, Khuzestan province: Baghmalek, Ghale-Tol, (31°37'49.70" N, 49°52'53.35" E, 880 m a.s.l.), 5.III.2017, 2 ♀♀, leg.: M. Zargar.



**Figure 3** *Opiostomus griffithsi* (Fischer, 1962): A. Head, dorsal view; B. Head, frontal view; C. Head, lateral view; D. Mesosoma, dorsal view; E. Mesosoma, lateral view; F. Metasoma, dorsal view. G. Hind leg; H. Wings; I. Habitus, lateral view.



**Figure 4** Global distribution map of *Opiostomus griffithsi* (Fischer, 1962) (Hymenoptera: Braconidae, Opiinae).

**Distribution in Iran:** Sistan & Baluchestan (Khajeh *et al.*, 2014), Kerman (Safahani *et al.*, 2018), Khuzestan (current study).

**General distribution:** Eastern and Western Palearctic (Yu *et al.*, 2016).

#### *Opius caricivorae* Fischer, 1964

**Material examined:** Iran, Khuzestan province: Dezful, Ghale-Rob, (32°17'27.94" N, 48°25'46.98" E, 97 m a.s.l.), 5.VI.2017, 2 ♀♀, leg.: M. Zargar.

**Distribution in Iran:** Sistan & Baluchestan (Khajeh *et al.*, 2014), Khuzestan (current study).

**General distribution:** Eastern and Western Palearctic, Oriental (Yu *et al.*, 2016).

#### *Opius flavipes* Szepliget, 1898

**Material examined:** Iran, Guilan province: Orkom (36°45'44.34" N, 50°18'11.88" E, 1201 m a. s. l.), 18.X.2010, 1 ♀, leg.: M. Khayrandish.

**Distribution in Iran:** Hormozgan (Ameri *et al.*, 2014), Kerman (Safahani *et al.*, 2018), Guilan (Dolati *et al.*, 2021; current study).

**General distribution:** Eastern and Western Palearctic (Yu *et al.*, 2016).

#### *Opius gracilis* Fischer, 1957

**Material examined:** Iran, Alborz province: Sarzariat (35°55'10.38" N, 51°06'51.24" E, 1980 m a. s. l.), 07.IX.2010, 1 ♀, leg.: M. Khayrandish.

**Distribution in Iran:** Golestan (Gadallah *et al.*, 2018), Kerman (Safahani *et al.*, 2018), Khuzestan

(Gadallah *et al.*, 2022), Alborz, Guilan and Tehran (Dolati *et al.*, 2019; current study).

**General distribution:** Eastern and Western Palearctic, Europe (Yu *et al.*, 2016).

#### *Opius instabilis* Wesm., 1835

**Material examined:** Iran, Khuzestan province: Abadan, Naghsh-e-Hayer, (30°12'08.15" N, 48°26'19.39" E, 1 m a.s.l.), 21.IV.2017, 1 ♀; Khoramshahr, Shaneh, (30°25'32.24" N, 48°11'20.83" E, 2 m a.s.l.), 22.V.2017, 1 ♀, leg.: M. Zargar.

**Distribution in Iran:** Lorestan, Chaharmahal and Bakhtiary (Gadallah *et al.*, 2022), Khuzestan (current study).

**General distribution:** Eastern and Western Palearctic, Europe (Yu *et al.*, 2016).

#### *Opius larissa* Fischer, 1968

**Material examined:** Iran, Guilan province: Ziaz (36°52'27.18" N, 50°13'24.78" E, 490 m a. s. l.), 08.XI.2010, 1 ♀; Alborz province: Sarzariat (35°55'10.38" N, 51°06'51.24" E, 1980 m a. s. l.), 15.VI.2010, 3 ♀♀, leg.: M. Khayrandish, Khuzestan province: Behbahan, Dodangeh, (30°42'08.38" N, 50°10'41.81" E, 300 m a.s.l.), 5.V.2017, 1 ♀, leg.: M. Zargar.

**Distribution in Iran:** Alborz, Guilan (Dolati *et al.*, 2019; current study), Khorasan Razavi (Gadallah *et al.*, 2022), Khuzestan (current study).

**General distribution:** Eastern and Western Palearctic, Europe (Yu *et al.*, 2016).

***Opius levis* Wesmael, 1835**

**Material examined:** Iran, Guilan province: Orkom (36°45'44.34" N, 50°18'11.88" E, 1201 m a. s. l.), 14.VI.2010, 1♀, leg.: M. Khayrandish.

**Distribution in Iran:** Fars (Lashkari Bod *et al.*, 2010, 2011), Kermanshah (Gadallah *et al.*, 2016), East Azarbaijan (Gadallah *et al.*, 2022), Guilan (Farahani *et al.*, 2016; current study), Sistan & Baluchestan (Khajeh *et al.*, 2014), Isfahan (Gadallah *et al.*, 2016), Mazandaran (Dolati *et al.*, 2021).

**General distribution:** Afrotropical, Eastern and Western Palaearctic, Europe (Yu *et al.*, 2016).

***Opius lugens* Haliday, 1837**

**Material examined:** Iran, Guilan province: Orkom (36°45'44.34" N, 50°18'11.88" E, 1201 m a. s. l.), 28.VI.2010, 1♀; Qazvin province: Zereshk Road (36°21'39.72" N, 50°03'55.56" E, 1541 m a. s. l.), 13.IV.2011, 1♀, leg.: M. Khayrandish, Khuzestan province: Baghmalek, Ghale-Tol, (31°37'49.70" N, 49°52'53.35" E, 880 m a.s.l.), 5.III.2017, 3 ♀♀, leg.: M. Zargar.

**Distribution in Iran:** Kermanshah (Gadallah *et al.*, 2016), Kerman (Safahani *et al.*, 2018), Guilan (Dolati *et al.*, 2021; current study), Khuzestan and Qazvin (current study).

**General distribution:** Afrotropical, Eastern and Western Palaearctic, Europe (Yu *et al.*, 2016).

***Opius mischa* Fischer, 1968**

**Material examined:** Iran, Qazvin province: Zereshk Road (36°21'43.02" N, 50°03'53.22" E, 1553 m a. s. l.), 13.IV.2011, 1♀, leg.: M. Khayrandish.

**Distribution in Iran:** Guilan (Dolati *et al.*, 2021), Qazvin (current study).

**General distribution:** Eastern and Western Palaearctic, Europe (Yu *et al.*, 2016).

***Opius nigricoloratus* Fischer, 1958**

**Material examined:** Iran, Khuzestan province: Andika, Dorab, (32°12'23.00" N, 49°26'37.00" E, 760 m a.s.l.), 4.V.2016, 2 ♀♀, leg.: M. Zargar.

**Distribution in Iran:** Guilan (Gadallah *et al.*, 2016), Semnan (Gadallah *et al.*, 2022), Khuzestan (current study).

**General distribution:** Eastern and Western Palaearctic, Europe (Yu *et al.*, 2016).

***Opius pallipes* Wesmael, 1835**

**Material examined:** Iran, Khuzestan province: Behbahan, Dodangeh, (30°42'08.38" N, 50°10'41.81" E, 300 m a.s.l.), 5.VI.2017, 1 ♀, leg.: M. Zargar.

**Distribution in Iran:** Guilan (Gadallah *et al.*, 2016), Sistan & Baluchestan (Khajeh *et al.*, 2014), Kerman (Ranjbar *et al.*, 2016, Safahani *et al.*, 2018), Khuzestan (current study).

**General distribution:** Eastern and Western Palaearctic, Nearctic, Oriental (Yu *et al.*, 2016).

**Genus *Phaedrotoma* Foerster, 1863*****Phaedrotoma cingulatus* (Wesmael, 1835)**

**Material examined:** Iran, Guilan province: Orkom (36°45'44.34" N, 50°18'11.88" E, 1201 m a. s. l.), 27.IX.2010, 1♀, leg.: M. Khayrandish.

**Distribution in Iran:** Kermanshah (Gadallah *et al.*, 2016), Khuzestan, Mazandaran (Gadallah *et al.*, 2022), Guilan (current study).

**General distribution:** Eastern and Western Palaearctic (Yu *et al.*, 2016).

***Phaedrotoma depeculator* Förster, 1863**

**Material examined:** Iran, Mazandaran province: Tangehvaz (36°21'55.68" N, 52°06'10.32" E, 702 m a. s. l.), 03.X.2011, 1♀, leg.: M. Khayrandish.

**Distribution in Iran:** Kermanshah (Gadallah *et al.*, 2016), Ardabil (Ghahari and van Achterberg, 2016), Guilan and Mazandaran (Dolati *et al.*, 2018; current study).

**General distribution:** Eastern and Western Palaearctic (Yu *et al.*, 2016).

***Phaedrotoma exigua* (Wesmael, 1835)**

**Material examined:** Iran, Mazandaran province: Gaznasara (36°16'58.08" N, 52°10'55.62" E, 2013 m a. s. l.), 27.V.2011, 2♀♀, leg.: M. Khayrandish, Khuzestan province: Behbahan, Dodangeh, (30°42'08.38" N, 50°10'41.81" E, 300 m a.s.l.), 21.IV.2017, 1 ♀; Dezful, Ghale-Rob, (32°17'27.94" N, 48°25'46.98" E, 97 m a.s.l.), 4.V.2016, 3 ♀♀; Ramhormoz, Gharabad, (30°59'37.73" N,

49°46'50.63" E, 126 m a.s.l.), 5.V.2017, 2 ♀♀, leg.: M. Zargar.

**Distribution in Iran:** Tehran (Fischer, 1990), Sistan & Baluchestan (Khajeh *et al.*, 2014), Lorestan (Farahani *et al.*, 2016), Kerman (Ranjbar *et al.*, 2016, Safahani *et al.*, 2018), Alborz, Guilan, Mazandaran, Qazvin and Tehran (Dolati *et al.*, 2018), Khuzestan and Mazandaran (current study).

**General distribution:** Afrotropical, Eastern and Western Palaearctic, Europe, Oriental (Yu *et al.*, 2016).

***Phaedrotoma nitidulator* (Nees, 1834)**

**Material examined:** Iran, Khuzestan province: Ramhormoz, Gharabad, (30°59'37.73" N, 49°46'50.63" E, 126 m a.s.l.), 5.V.2017, 2 ♀♀, leg.: M. Zargar.

**Distribution in Iran:** Ardabil province (Gadallah *et al.*, 2016), Khuzestan province (current study).

**General distribution:** Eastern and Western Palaearctic Nearctic (Yu *et al.*, 2016).

***Phaedrotoma ochrogaster* (Wesmael, 1835)**

**Material examined:** Iran, Guilan province: Ghazichak (36°45'57.54" N, 50°19'35.22" E, 1803 m a. s. l.), 10.V.2010, 1♀; Alborz province: Arangeh (35°55'07.20" N, 51°05'09.24" E, 1891 m a. s. l.), 29.VI.2010, 3♀♀; Mazandaran province: Tangehvaz (36°21'55.02" N, 52°06'10.74" E, 692 m a. s. l.), 11.X.2011, 1♀, leg.: M. Khayrandish.

**Distribution in Iran:** Alborz, Guilan and Mazandaran (Dolati *et al.*, 2019; current study).

**General distribution:** Eastern and Western Palaearctic (Yu *et al.*, 2016).

***Phaedrotoma pseudonitida* (Fahringer, 1943)**

**Material examined:** Iran, Tehran province: Shahriar (35°40'03.06" N, 50°56'52.14" E, 1168 m a. s. l.), 25.V.2010, 1♀, leg.: M. Khayrandish.

**Distribution in Iran:** Tehran (Dolati *et al.*, 2021; current study).

**General distribution:** Eastern and Western Palaearctic (Yu *et al.*, 2016).

***Phaedrotoma pulchriceps* (Szépligeti, 1898)**

**Material examined:** Iran, Alborz province: Karaj (35°46'08.88" N, 50°56'55.20" E, 1277 m a. s. l.), 18.V.2010, 1♀, Arangeh (35°55'07.20" N, 51°05'09.24" E, 1891 m a. s. l.), 13.VII.2010,

1♀; Tehran province: Shahriar (35°40'08.10" N, 50°56'56.64" E, 1168 m a. s. l.), 07.IX.2010, 4♀♀, leg.: M. Khayrandish.

**Distribution in Iran:** East Azarbaijan (Gadallah *et al.*, 2022), Guilan (Farahani *et al.*, 2016, reported as *Opius (Phaedrotoma) pulchriventris* (Fischer, 1958)), Kerman (Madjdzadeh *et al.*, 2021); Alborz and Tehran (Dolati *et al.*, 2018, reported as *Phaedrotoma pulchriventris* (Fischer, 1958); current study).

**General distribution:** Eastern and Western Palaearctic, Europe, Nearctic, Oriental (Yu *et al.*, 2016).

***Phaedrotoma variegata* (Szépligeti, 1896)**

**Material examined:** Iran, Khuzestan province: Ramhormoz, Gharabad, (30°59'37.73" N, 49°46'50.63" E, 126 m a.s.l.), 5.V.2017, 3♀♀; Khoramshahr, Shaneh, (30°25'32.24" N, 48°11'20.83" E, 2 m a.s.l.), 21.VI.2016, 2♀♀; Andika, Chezi, (32°08'02.78"N, 49°38'30.56"E, 650 m a.s.l.), 5.V.2017, 2♀♀; Lali, Taraz, (32°20'49.70" N, 49°05'11.31" E, 390 m a.s.l.), 4.IV.2017, 2♀♀, leg.: M. Zargar.

**Distribution in Iran:** Tehran (Dolati *et al.*, 2018), Khuzestan (current study).

**General distribution:** Eastern and Western Palaearctic, Europe (Yu *et al.*, 2016).

**Genus *Psytalia* Walker, 1860**

***Psytalia romani* (Fahringer, 1935)**

**Figs. 5(A-I), 6**

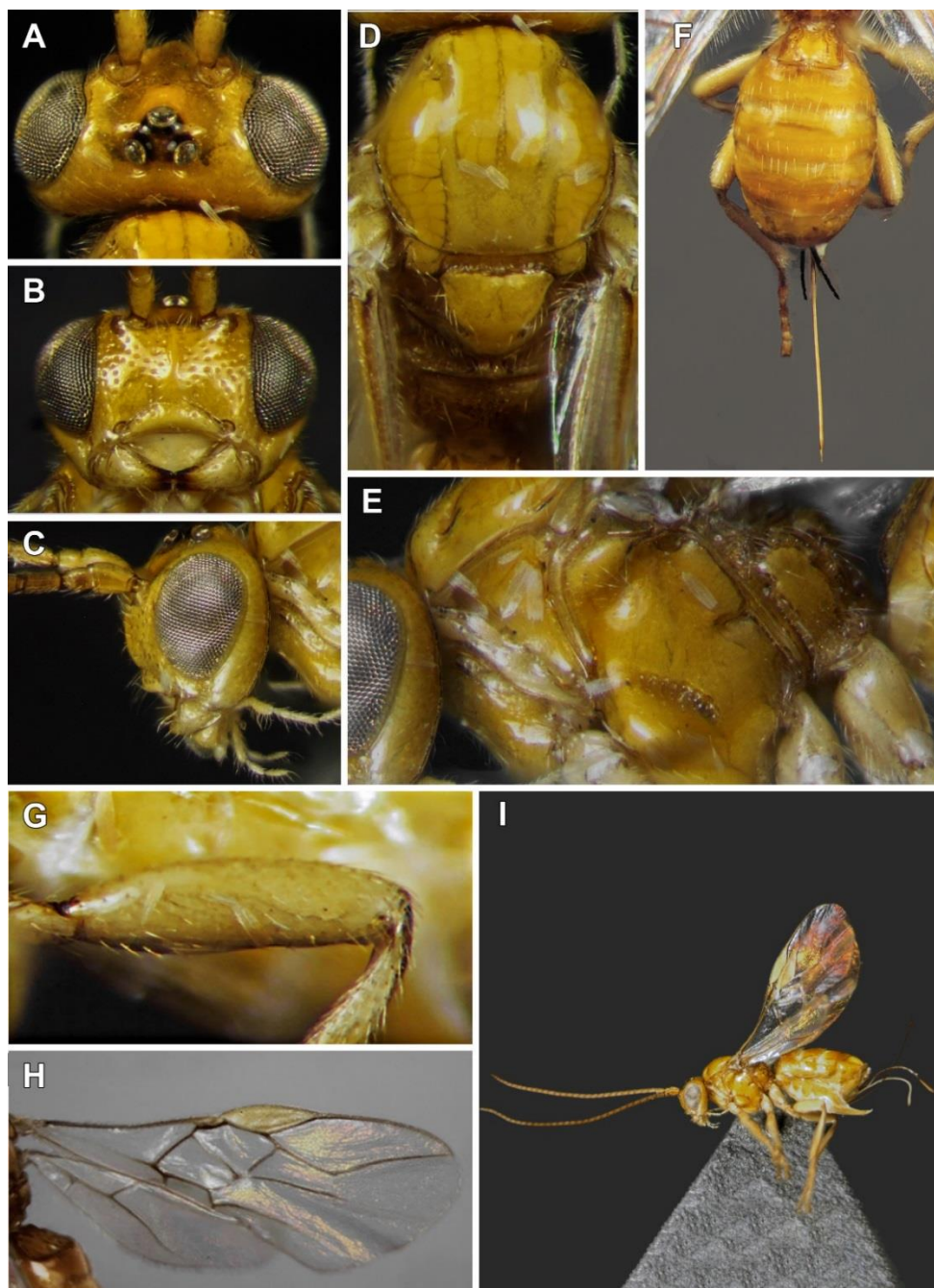
**Material examined:** Iran, Khuzestan province: Dezful, Shahid Mohammad-e-Montazeri, (32°17'27.94" N, 48°25'46.98" E, 97 m a.s.l.), 21.V.2016, 2♀♀, leg.: M. Zargar.

**Diagnosis (Female):** Antenna as long as body, with 34 antennomeres; width of head in dorsal view 2.1 × as wide as length (Fig. 5A); length of eye in dorsal view as long as temple (Fig. 5A); oral cavity developed (Fig. 5B); mesosoma 1.3 × its maximum height (Fig. 5E); notauli present in anterior half; medio-posterior mesoscutal depression not developed (Fig. 5D); side of mesothorax smooth (Fig. 5E); precoxal sulcus sculptured (Fig. 5E); pterostigma triangular; m-cu vein antefurcal; vein 1cu-a postfurcal; 3RSa vein 1.2 × longer than 2RS vein (Fig. 5H); length of hind femur 3.0 × its



maximum width in middle part (Fig. 5G); propodeum with two lateral carinae or longitudinal ridge (Fig. 5F); ovipositor exerted,  $0.9 \times$  length of metasoma (Fig. 5F). Body length 3.5 mm (Fig. 5I).

**Distribution in Iran:** Khuzestan (current study).  
**General distribution:** Eastern Palaearctic (Russia Far East, China, Korea), (Wu et al., 2016; Yu et al., 2016), Iran (**new record**) (Fig. 6).



**Figure 5** *Psyttalia romani* (Fahringer, 1935): A. Head, dorsal view; B. Head, frontal view; C. Head, lateral view; D. Mesosoma, dorsal view; E. Mesosoma, lateral view; F. Metasoma, dorsal view; G. Hind leg; H. Wings; I. Habitus, lateral view.



**Figure 6** Global distribution of *Psyttalia romani* (Fahringer, 1935) (Hymenoptera: Braconidae, Opiinae).

**Genus *Psyttoma* van Achterberg & Li, 2012**

***Psyttoma wachsmanni* (Szépligeti, 1898)**

**Material examined:** Iran, Tehran province: Iran National Botanical Garden (35°44'19.91" N, 51°10'52.49" E, 1265 m a. s. l.), 18.V.2010, 1♀, leg.: M. Khayrandish.

**Distribution in Iran:** Lorestan (Farahani *et al.*, 2016), Alborz, Guilan and Qazvin (Dolati *et al.*, 2019), Tehran (current study).

**General distribution:** Eastern and Western Palearctic (Yu *et al.*, 2016).

**Genus *Utetes* Foerster, 1863**

***Utetes rotundiventris* (Thomson, 1895)**

**Material examined:** Iran, Alborz province: Sarziarat (35°55'10.38" N, 51°06'51.24" E, 1980 m a. s. l.), 15.VI.2010, 1♀; Mazandaran province: Joorband (36°26'17.28" N, 52°07'16.62" E, 272 m a. s. l.), 26.IX.2011, 2♀♀, leg.: M. Khayrandish.

**Distribution in Iran:** Markazi (Gadallah *et al.*, 2022), Guilan (Dolati *et al.*, 2018), Mazandaran (Dolati *et al.*, 2018; current study), Alborz (current study).

**General distribution:** Eastern and Western Palearctic (Yu *et al.*, 2016).

**Genus *Xynobius* Foerster, 1863**

***Xynobius caelatus* (Haliday, 1837)**

**Material examined:** Iran, Mazandaran province: Gaznasara (36°16'56.82" N, 52°10'58.50" E, 2032 m a. s. l.), 11.V.2011, 2♀♀; Mazandaran province: Tangehvaz

(36°21'55.68" N, 52°06'10.32" E, 702 m a. s. l.), 12.IV.2011, 1♀, leg.: M. Khayrandish.

**Distribution in Iran:** Mazandaran and Qazvin (Dolati *et al.*, 2018; current study).

**General distribution:** Europe and Western Palearctic (Yu *et al.*, 2016).

***Xynobius comatus* (Wesmael, 1835)**

**Figs 7(A-I), 8**

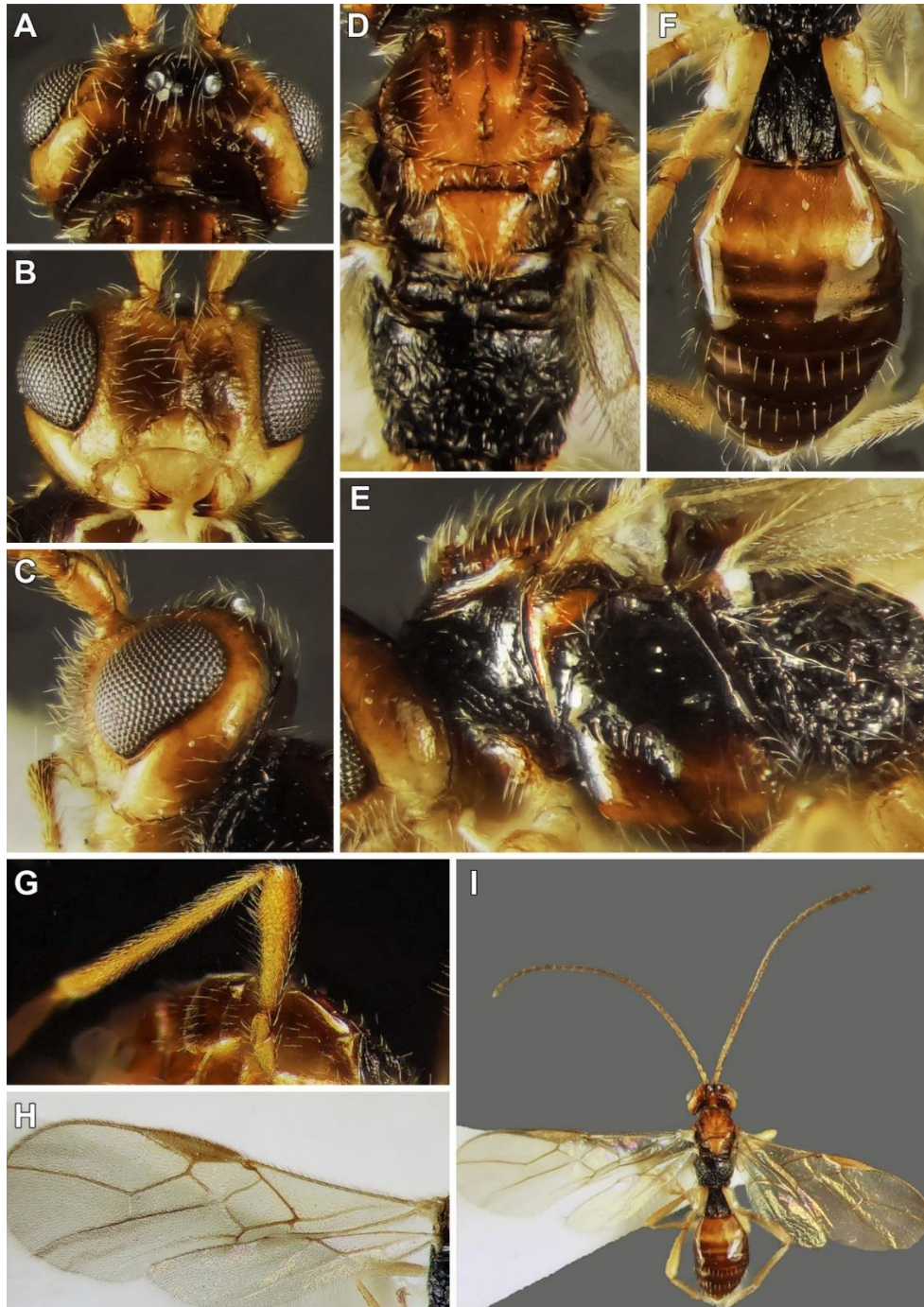
**Material examined:** Iran, Mazandaran province: Tangehvaz (36°21'55.02" N, 52°06'10.74" E, 692 m a. s. l.), 11.X.2011, 2♀♀, leg.: M. Khayrandish.

**Diagnosis (Female):** Antenna 1.4 × as long as body, with 23-24 antennomeres (Fig. 7I); width of head about 2.0 × its maximum height (Fig. 7A); oral cavity developed (Fig. 7B); mesosoma about 1.6 × its maximum height (Fig. 7E); mesonotum with medio-posterior mesoscutal depression (Fig. 7D); notauli reaching to medio-posterior mesoscutal depression (Fig. 7D); scutellum smooth (Fig. 7D); precoxal sulcus sculptured (Fig. 7E); pterostigma almost semi-elliptical, 3RSa vein 1.5 × as long as 2RS vein, 3RSb vein straight, about 2.0 × as long as 3RSa vein, m-cu vein interstitial to slightly antefurcal, wings hyaline transparent (Fig. 7H); legs long, thin and yellow, length of hind femur 5.0 × its maximum width in middle part (Fig. 7G); propodeum rugose, matte, lacking distinct longitudinal ridge (Fig. 7D); first metasomal tergite 1.3 × as long as its width at apex (Fig. 7F); ovipositor barely exerted (Fig. 7F); body dark colored, face and 2<sup>nd</sup> metasomal tergite

with somewhat developed red or yellowish pattern (Fig. 7I); body length 2.5 mm (Fig. 7I).

**Distribution in Iran:** Mazandaran (current study).

**General distribution:** Eastern and Western Palearctic, Nearctic, Oriental (Yu *et al.*, 2016), Iran (new record) (Fig. 8).



**Figure 7** *Xynobius comatus* (Wesmael, 1835): A. Head, dorsal view; B. Head, frontal view; C. Head, lateral view; D. Mesosoma, dorsal view; E. Mesosoma, lateral view; F. Metasoma, dorsal view. G. Hind leg; H. Wings; I. Habitus, dorsal view.



**Figure 8** Global distribution of *Xynobius comatus* (Wesmael, 1835) (Hymenoptera: Braconidae, Opiinae).

***Xynobius curtifemur* (Fischer, 1961)**

**Material examined:** Iran, Guilan province: Ghazichak (36°45'52.62" N, 50°20'01.08" E, 1787 m a. s. l.), 03.V.2010, 3♀♀, leg.: M. Khayrandish.

**Distribution in Iran:** Guilan (Dolati *et al.*, 2018; current study).

**General distribution:** Europe and Western Palearctic (Yu *et al.*, 2016).

***Xynobius maculipes* (Wesmael, 1835)**

**Material examined:** Iran, Khuzestan province: Khoramshahr, Shaneh, (30°25'32.24" N, 48°11'20.83" E, 2 m a.s.l.), 4.IV.2017, 2 ♀♀; Baghmalek, Ghale-Tol, (31°37'49.70" N, 49°52'53.35" E, 880 m a.s.l.), 22.VI.2017, 1 ♀; Dezful, Ghale-Rob, (32°17'27.94" N, 48°25'46.98" E, 97 m a.s.l.), 5.VI.2017, 2 ♀♀, leg.: M. Zargar.

**Distribution in Iran:** Tehran (Fischer 1990), Guilan (Gadallah *et al.*, 2016), East Azerbaijan (Gadallah *et al.*, 2022), Mazandaran (Dolati *et al.*, 2019), Khuzestan (current study).

**General distribution:** Eastern and Western Palearctic, Oriental (Yu *et al.*, 2016).

**Discussion**

The results revealed the presence of 32 species from the subfamily Opiinae, with four species recorded for the first time in Iran. Our findings have increased the total number of Iranian Opiinae to 137 (Safahani *et al.*, 2018; Peris-Felipo *et al.*, 2018; Dolati *et al.*, 2018, 2019,

2021; Ameri *et al.*, 2020; current study) and the total number of Braconidae to 926 (Rakhshani *et al.*, 2008, 2012; Ameri *et al.*, 2013, 2014, 2015, 2020; Farahani *et al.*, 2014, 2015, 2016; Zargar *et al.*, 2014, 2015, 2019 a-e, 2020; Ranjbar *et al.*, 2016; Abdoli *et al.*, 2019 a, b).

This study provides the first report of four species from Iran at the border between Eastern and Western Palearctic regions. Three species (*Apodesmia ocellata*, *Opiostomus (Opiostomus) griffithsi*, *Psytalia (Psytalia) romani*) exhibit relatively uniform distribution across the Palearctic region. However, *Xynobius (Xynobius) comatus* is distributed across Palearctic, Nearctic and Oriental regions (Yu *et al.*, 2016). Most of the recorded species were found in Eastern and Western Palearctic regions as well as Europe (29 Eastern Palearctic species and both Western Palearctic & Europe having each about 31 species), while fewer are reported from other regions like Afrotropical (three species), Nearctic (six species) and Oriental (six species). In neighboring countries, the number of recorded species varies significantly. For example, Azerbaijan has three recorded species, Turkmenistan has ten, and Armenia has 23 (Yu *et al.*, 2016). These numbers stand in stark contrast to those of neighboring countries such as Russia, with 319 (Tobias 1986, 1988; Yu *et al.*, 2016), and Turkey, with 174 species (Beyarslan and Fischer, 2011, 2013; Yu *et al.*, 2016; Beyarslan 2020). Given these disparities, it is evident that further research on this

subfamily in Iran is necessary. Considering the high diversity of Opiinae and their crucial role in the biological control of phytophagous Diptera (Fischer and Koponen, 1999), further research focusing on taxonomy, faunistics, and host associations is essential.

### Acknowledgments

We thank the Department of Entomology of Tarbiat Modares University for supporting this study financially. The authors wish to express their highest gratitude to Dr. Cornelis van Achterberg (Naturalis Biodiversity Center, P.O. 9517, 2300 RA Leiden, The Netherlands) and Dr. Peris-Felipo (Department of Agricultural Chemistry and Food Science, Autonomous University of Madrid, Spain) for their valuable guidance and supports. We cordially thank the Subject Editor and two anonymous reviewers for their valuable comments and recommendations on the earlier version of this paper.

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## اطلاعات تکمیلی در مورد زنبورهای پارازیتوئید زیرخانواده Opiinae (Hymenoptera: Braconidae) همراه با گزارش جدید چهار گونه در ایران

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**چکیده:** در این مطالعه، فون زنبورهای زیرخانواده Opiinae در مناطق شمال مرکزی (۱۳۸۹-۱۳۹۱) و قسمت جنوب غربی ایران، استان خوزستان (۱۳۹۴-۱۳۹۵) مورد بررسی قرار گرفت. نمونه‌ها با استفاده از تله مالیز جمع‌آوری شدند. در نتیجه ۳۲ گونه شناسایی شدند که گونه‌های *Opiostomus (Opiostomus) griffithsi* (Fischer, ۱۸۳۵)، *Apodesmia ocellata* (Wesmael, 1835)، *Psytalia (Psytalia) romani* و *Xynobius (Xynobius) comatus* (Wesmael, 1835) (Fahringier, 1935) برای اولین بار از ایران گزارش می‌شوند. علاوه بر این، ۲۰ گونه رکوردهای جدید استانی هستند. توصیف مختصر و عکس‌های مربوط به گونه‌هایی که برای اولین بار از ایران گزارش شده‌اند، تهیه شده است.

**واژگان کلیدی:** Opiinae، خوزستان، پارازیتوئید، گزارش جدید، پراکنش، ایران