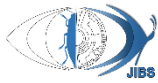


Original Article 

# New records and additional data on Anomaloninae (Hymenoptera: Ichneumonidae) from Iran

Zahra Banani Sarvestani <sup>1</sup>  | Ali Asghar Talebi <sup>1</sup>  | Abbas Mohammadi-Khoramabadi <sup>2</sup>  | Ali Feizi <sup>1</sup> 

<sup>1</sup> Department of Entomology, Faculty of Agriculture, Tarbiat Modares University, P. O. Box: 14115-336, Tehran, I. R. Iran. Emails: [zahra.banani@modares.ac.ir](mailto:zahra.banani@modares.ac.ir); [talebia@modares.ac.ir](mailto:talebia@modares.ac.ir); [alifeizi@modares.ac.ir](mailto:alifeizi@modares.ac.ir)

<sup>2</sup> Department of Plant Production, College of Agriculture and Natural Resources of Darab, Shiraz University, Fars, Iran. Email: [mohamadk@shirazu.ac.ir](mailto:mohamadk@shirazu.ac.ir)

Corresponding author: Ali Asghar Talebi |  [talebia@modares.ac.ir](mailto:talebia@modares.ac.ir)

<https://zoobank.org/urn:lsid:zoobank.org:C2454103-7C8C-47EB-B125-5B2FCA22BF88>

Academic Editor  
Ehsan Rakhshani

Received  
April 27, 2026

Revised  
June 10, 2026

Accepted  
June 12, 2026

Published online  
June 13, 2026

**ABSTRACT.** The fauna of parasitoid wasps belonging to the subfamily *Anomaloninae* (Hymenoptera: Ichneumonidae) was investigated in the north central and southern parts of Iran. Specimens were collected using Malaise traps during 2010–2013 and identified based on morphological characteristics. Four species are newly recorded for the fauna of Iran: *Erigorgus annulitarsis* (Thomson, 1892), *E. varicornis* (Thomson, 1894), *Therion circumflexum* (Linnaeus, 1758), and *Trichomma occisor* Habermehl, 1909. In addition, 18 species are newly recorded at the provincial level. With these additions, the number of known Iranian species of Anomaloninae is raised to 50. Diagnostic characters and illustrations are provided for the newly recorded species and three previously recorded taxa, contributing to improved taxonomic knowledge of the group in the region.

**KEYWORDS:** Darwin wasps, Distribution, Faunistic survey, Parasitoid, New records, Morphology

**Citation:** Banani Sarvestani, Z., Talebi, A.A., Mohammadi-Khoramabadi, A. & Feizi, A. (2026) New records and additional data on Anomaloninae (Hymenoptera: Ichneumonidae) from Iran. *Journal of Insect Biodiversity and Systematics*, 12 (03), 613–631.

## INTRODUCTION

Ichneumonidae Latreille, 1802 is one of the most diverse families of Hymenoptera with more than 25,000 described species worldwide (Yu et al. 2016). Anomaloninae Viereck, 1918 is a cosmopolitan and moderately large subfamily of Ichneumonidae comprising two tribes, 46 genera, and approximately 700 species (Sheng et al. 2012; Broad 2014; Ward 2015; Yu et al. 2016). Members of this subfamily are mostly solitary koinobiont endoparasitoids of Lepidoptera, particularly larvae of Lasiocampidae, Lycaenidae, and Saturniidae (Matsumura 1926; Uchida 1954) as well as Coleoptera larvae, especially Elateridae and Tenebrionidae (Dasch 1984; Gauld 1978, 1984; Yu et al. 2016). Anomaloninae exhibit wide geographic distribution and adaptability to diverse habitats, from agricultural ecosystems (Scaramozzino et al. 2018) to tropical forests (Veijalainen et al. 2013), and unlike many ichneumonid groups, they are also relatively common in dry and semi-arid environments (Broad et al. 2018). This ecological variation is also indicated in Iran, where species have been recorded from the humid Caspian forests (e.g., Guilan and Mazandaran provinces) (Hooshyar & Vafaei-Shoushtari 2013; Ghahari et al. 2026) to the dry southern provinces (e.g., Hormozgan, Kerman, Sistan & Baluchestan, South Khorasan) (Zardouei Heydari et al. 2109, 2020). However, detailed studies on their ecological roles and specific host-parasitoid interactions remain limited (Broad et al. 2018). Further research is encouraged to better understand their potential in biological control in the diverse ecosystems of Iran. Prior to this study, the subfamily Anomaloninae was represented by 46 species across 13 genera in Iran (Darvish Mojeni &

Šedivy 2001; Masnadi-Yazdinejad & Jussila 2009; Zarepour et al. 2009; Barahoei et al. 2012, 2014, 2015; Hooshyar & Vafaei-Shoushtari 2013; Hooshyar et al. 2014; Zardouei Heydari et al. 2019, 2020; Mohammadi-Khoramabadi et al. 2020; Ghahari et al. 2026). Kolarov and Ghahari (2005) reported six species in three genera: *Anomalon* Panzer, 1804; *Barylypa* Foerster, 1869; and *Kokujewiella* Shestakov, 1926. Barahoei et al. (2012) listed 11 species in four genera. The genus *Erigorgus* Foerster, 1869 was added to the fauna of Iran by Hooshyar et al. (2012). According to Ghahari et al. (2026), seven other genera of Anomaloninae have been reported from Iran for the first time as follows: *Trichomma* Wesmael, 1849 in 2015; *Habronyx* Foerster, 1869 in 2020; *Therion* Curtis, 1829, *Aphanistes* Foerster, 1869, and *Habrocampulum* Foerster, 1869 in 2021; *Atrometus* Foerster, 1869, and *Perisphincter* Townes, 1961 in 2022.

This study aims to expand the knowledge of the fauna of Anomaloninae of Iran. Furthermore, it provides detailed diagnostic morphological characteristics, as well as the illustrations that are provided for three previously recorded species – *Agrypon flaveolatum* (Gravenhorst, 1807), *Barylypa propugnator* (Foerster, 1855), and *Heteropelma megarthrum* (Ratzeburg, 1848) – for which such comprehensive data were previously lacking in earlier Iranian records.

## MATERIAL AND METHODS

Sampling was conducted using Malaise traps across the Provinces of the north-central region (Guilan and Alborz in 2010; Mazandaran, Tehran, and Qazvin in 2011) and the south-central region (Fars and Hormozgan in 2012–2013) of Iran. Collected specimens were preserved in 75% ethanol and card-mounted after treatment according to the AXA method (Achterberg 2009). An Olympus SZH10 stereo microscope was utilized for specimen examination. Identification was performed using taxonomic keys from Atanasov (1981), Gauld (1978, 1980), Gauld & Mitchell (1977), Schnee (2008, 2014), and Zardouei Heydari et al. (2020). Morphological terminology follows Broad et al. (2018), and microsculpture follows Eady (1968). Wing venation nomenclature follows Gauld (1991). Images were captured using a Canon® EOS 150SD camera and stacked with Helicon Focus, and finally edited in Adobe Photoshop 2019. All specimens examined in this study are deposited in the Entomological collection of the Department of Entomology, Faculty of Agriculture, Tarbiat Modares University, Tehran, Iran (TMUC).

**Abbreviations.** OOL: Ocular-Ocellar distance; PTM: Posterior Transverse carina of the Mesosternum.

## RESULTS

**Class Insecta Linnaeus, 1758**

**Order Hymenoptera Linnaeus, 1758**

**Family Ichneumonidae Latreille, 1802**

**Subfamily Anomaloninae Viereck, 1918**

**Genus *Agrypon* Foerster, 1860**

**Type species:** *Ophion flaveolatum* (Gravenhorst, 1807).

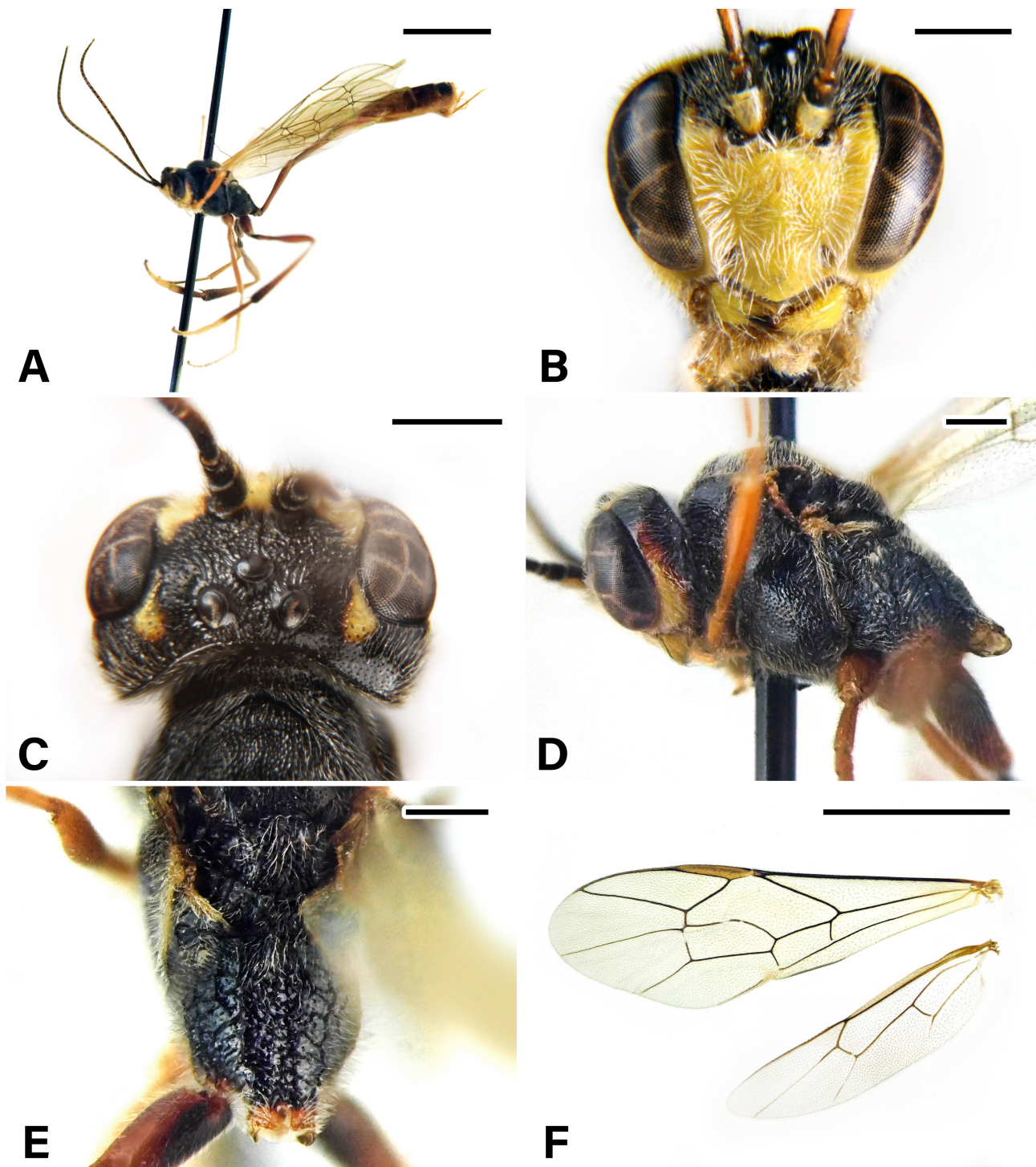
***Agrypon flaveolatum* (Gravenhorst, 1807)**

(Figs 1A–F)

**Material examined.** 1♀, **Guilan Province**, Rudsar County, Rahimabad district, Orkom (36°45'44.34"N, 50°18'11.88"E, 1201 m a.s.l), 1♀, 17–24.v.2010, leg. M. Khayrandish.

**Morphological characteristics.** Female, body length 11.5 mm (Fig. 1A); head and mesosoma with dense silvery pilosity; antennae with 32 flagellomeres; 1<sup>st</sup> flagellomere 5× as long as wide, middle flagellomeres 1.7× as long as wide; malar space 0.25× as wide as base of mandible; clypeus smooth and shiny, 1.8× as wide as high, apically with one medial tooth; face medially rugose-punctate, 1.4× as wide as high (Fig. 1B); compound eyes ventrally converging; frons reticulate-rugose, with a vertical carina; temple smooth and shiny, punctate, 0.7× width of compound eye in dorsal view; OOL 1.6× as long as hind ocellus (Fig. 1C); mesoscutum punctate (interspaces greater than diameter of a puncture), reticulate-

rugose medially; scutellum slightly convex, strongly punctate (interspaces less than diameter of a puncture); epicnemial carina complete; mesopleuron punctate; speculum smooth and shiny (Fig. 1D); PTM weak in anterior to middle coxae; propodeum reticulate-rugose (Fig. 1E); fore coxae without ventral carina; legs orange; hind coxae dark brown ventrally; hind trochanters black; hind tibiae brown apically; hind tarsus yellow, except basal 0.7 of 1<sup>st</sup> tarsomere red, 1<sup>st</sup> tarsomere 2.3× as long as 2<sup>nd</sup> tarsomere; tegula yellow-orange, stigma brown; hindwing vein Cu1 not recurrent (Fig. 1F); metasomal tergites red, 2<sup>nd</sup> to 8<sup>th</sup> tergites dark brown dorsally; ovipositor sheath 0.4× as long as hind tibia.



**Figure 1.** *Agrypon flaveolatum* (Gravenhorst, 1807), female: A. Habitus; B. Face, frontal view; C. Head, dorsal view; D. Mesopleuron, lateral view; E. Propodeum, dorsal view; F. Wings, venation; Scales: A, F: 3 mm; B–E: 0.5 mm.

**Distribution in Iran.** Razavi Khorasan (Masnadi-Yazdinejad 2010) and Guilan (current study) Provinces.

**Zoogeographical distribution.** Palaearctic, Oriental and Nearctic (Yu et al. 2016; Riedel et al. 2018, 2023).

**Note.** This is the second record of this species from Iran. It was previously documented as a larval parasitoid of *Yponomeuta malinellus* Zeller, 1838 (Lepidoptera: Yponomeutidae) in northeastern Iran (Masnadi-Yazdinejad 2010). Given the wide distribution and economic importance of this species in the conservation and classical biological control of many Lepidoptera (Yu et al. 2016; Ghahari et al. 2026), morphological data and illustrations are provided here for the first time in Iran as fundamental reference material.

### Genus *Anomalon* Panzer, 1804

**Type species:** *Anomalon cruentatum* (Geoffroy, 1785).

#### *Anomalon amseli* (Hedwig, 1961)

**Material examined.** 9♀♀, **Fars Province**, Jahrom, Goldamcheh, trap I (28°39'31.76"N, 53°32'17.02"E, 1018 m a.s.l.), 2♀♀, 17.vi.2012, 1♀, 02.vii.2012, trap II (28°39'35.18"N, 53°32'10.77"E, 1017 m a.s.l.), 1♀, 14.v.2012, 1♀, 18.vi.2012, 2♀♀, 02.vii.2012; trap III (28°40'28.52"N, 53°33'47.79"E, 1031 m a.s.l.), 1♀, 20.v.2012; Eghlid County, Shahremian (30°54'39.07"N, 52°28'16.82"E, 2120 m a.s.l.), 1♀, 05.vii.2012, leg. A. Amiri.

**Distribution in Iran.** Razavi Khorasan (Masnadi-Yazdinejad & Jussila 2009), Sistan & Baluchestan (Zardouei Heydari et al. 2020), and Fars Provinces (current study).

**Zoogeographical distribution.** West Palaearctic (Yu et al. 2016).

#### *Anomalon chinense* (Kokujev, 1915)

**Material examined.** 18 ♀♀, **Alborz Province**, Karaj County, trap I (35°46'20.16"N, 50°56'44.94"E, 1278 m a.s.l.), 1♀, 28.ix–05.x.2010; 1♀, 05–13.x.2010; trap II (35°46'08.88"N, 50°56'55.20"E, 1277 m a.s.l.), 1♀, 18–24.viii.2010; 1♀, 22–28.ix.2010; Shahriar (35°40'08.10"N, 50°56'56.64"E, 1168 m a.s.l.), 1♀, 06–16.ix.2010; Chalous road, Sarzariat (35°55'10.38"N, 51°06'51.24"E, 1980 m a.s.l.), 1♀, 15–22.vi.2010, 1♀, 22–29.vi.2010, 1♀, 28.vii–03.viii.2010; **Qazvin Province**, Loshan, trap I (36°40'14.58"N, 49°25'38.52"E, 295 m a.s.l.), 1♀, 22.vi–06.vii.2011; trap II (36°40'09.12"N, 49°25'37.74"E, 291 m a.s.l.), 1♀, 26.v–09.vi.2011; Zereshk road (36°25'39.36"N, 50°06'36.90"E, 1997 m a.s.l.), 3♀♀, 26.vii–17.viii.2011, 3♀♀, 17.viii–04.ix.2011, leg. A. Nadimi; **Mazandaran Province**, Noor, Chamestan, Gaznasara (36°16'56.82"N, 52°10'58.50"E, 2032 m a.s.l.), 1♀, 28.vi–18.vii.2011, leg.: M. Khayrandish; **Fars Province**, Eghlid County, Dejekord (30°43'58.91"N, 51°56'55.10"E, 2171 m a.s.l.), 1♀, 04.ix.2013, leg. A. Amiri.

**Distribution in Iran.** Kermanshah (Zardouei Heydari et al. 2020), West Azarbaijan (Mohammadi-Khoramabadi et al. 2020), Fars, Alborz, Qazvin, and Mazandaran Provinces (present study).

**Zoogeographical distribution.** Palaearctic (Yu et al. 2016; Riedel & Japoshvili 2025).

#### *Anomalon cruentatum* (Geoffroy, 1785)

**Material examined.** 897♀♀, 15♂♂, **Alborz Province:** Shahriar, trap I (35°40'08.10"N, 50°56'56.64"E, 1168 m a.s.l.), 1♀, 08–15.vi.2010, 1♀, 15–28.vi.2010, 1♀, 01–24.v.2010, 2♀♀, 20.vii–02.viii.2010, 2♀♀, 27.vi–20.vii.2010, 4♀♀, 27.vi–20.vii.2010, 1♀, 09–23.vii.2010, 2♀♀, 09–23.vii.2010, 4♀♀, 02–26.vii.2010, 7♀♀, 02–26.vii.2010, 31♀♀, 16–30.viii.2010, 1♀, 12–25.viii.2010, 2♀♀, 12–25.viii.2010, 38♀♀, 12–25.viii.2010, 17♀♀, 19.viii–01.ix.2010, 72♀♀, 24.viii–17.ix.2010, 6♀♀, 24.viii–17.ix.2010, 44♀♀, 21.viii–13.ix.2010, 2♀♀, 21.viii–13.ix.2010, 88♀♀, 31.viii–13.ix.2010, 2♀♀, 31.viii–13.ix.2010, 42♀♀, 04–27.viii.2010, 13♀♀, 04–27.viii.2010, 108♀♀, 06–20.ix.2010, 2♀♀, 06–20.ix.2010, 98♀♀, 13–27.ix.2010, 1♀, 13–27.ix.2010, 51♀♀, 28.viii–21.ix.2010, 3♀♀, 28.viii–21.ix.2010, 12♀♀, 26.viii–08.ix.2010, 2♀♀, 26.viii–08.ix.2010, 2♀♀, 16–29.ix.2010; trap II (35°40'03.06"N, 50°56'52.14"E, 1168 m a.s.l.), 1♀, 25.iii–08.iv.2010, 1♀, 15–28.vi.2010, 1♀, 22.v–15.vi.2010, 2♀♀, 22.v–15.vi.2010, 6♀♀, 31.viii–13.ix.2010, 10♀♀, 06–20.ix.2010, 10♀♀, 21.viii–13.ix.2010, 1♀, 28.viii–21.ix.2010, 15♀♀, 28.viii–21.ix.2010, 2♀♀,

04–27.viii.2010, 8♀♀, 04–27.viii.2010, 1♀, 12–25.viii.2010, 4♀♀, 12–25.viii.2010; Karaj County, trap I (35°46'20.16"N, 50°56'44.94"E, 1278 m a.s.l.), 1♀, 31.v–13.vi.2010; 1♀, 15–28.vi.2010; 1♀, 12–25.vii.2010; 2♀♀, 31.viii–13.ix.2010; 2♀♀, 06–20.ix.2010; 1♀, 13–27.ix.2010; trap II (35°46'08.88"N, 50°56'55.20"E, 1277 m a.s.l.), 1♀, 08–21.vi.2010, 3♀♀, 15–28.vi.2010, 4♀♀, 25.iii–08.iv.2010, 2♀♀, 28.vi–11.vii.2010, 1♀, 02–26.vii.2010; 2♀♀, 09–23.vii.2010; 3♀♀, 16–30.viii.2010; 2♀♀, 22.v–15.vi.2010; 5♀♀, 06–20.ix.2010, 2♀♀, 24.viii–17.ix.2010, 7♀♀, 13–27.ix.2010, 9♀♀, 21.viii–13.ix.2010, 7♀♀, 28.viii–21.ix.2010, 6♀♀, 04–27.viii.2010, 1♀, 12–25.viii.2010, Chalous road, Shahrestanak (35°58'16.26"N, 51°21'25.80"E, 2225m a.s.l.), 1♀, 24.viii–17.ix.2010; **Tehran Province**: Peykanshahr, National Botanical Garden of Iran (35°44'19.91"N, 51°10'52.49"E, 1265 m a.s.l.), 3♀♀, 04–18.v.2010, 75♀♀, 11♂♂, 18.v–08.vi.2010; **Qazvin Province**, Loshan (36°40'09.12"N, 49°25'37.74"E, 291 m a.s.l.), 1♀, 28.iv–04.v.2011; Zereshk road (36°25'23.88"N, 50°06'37.68"E, 1926 m a.s.l.), 1♀, 22.vi–10.vii.2011, 5♀♀, 25.vii–04.ix.2011, 1♀, 16–25.ix.2011, leg. A. Nadimi; **Guilan Province**: Astaneh Ashrafiyeh, Eshman Kamachal (37°22'03.66"N, 49°57'57.84"E, -1 m b.s.l.), 1♀, 17–24.x.2010; Roodsar, Rahim Abad, Orkom (36°45'44.34"N, 50°18'11.88"E, 1201 m a.s.l.), 2♀♀, 21.vi–04.vii.2010; 1♀, 05–18.vii.2010, 1♀, 19.vii–01.viii.2010, 1♀, 25.vii–01.viii.2010, 2♀♀, 08–22.viii.2010, 3♀♀, 1♂, 23.viii–06.ix.2010, 1♀, 13–20.ix.2010, 1♀, 04–11.ix.2010, 1♂, 03–17.x.2010, 1♀, 17–24.x.2010; Ghazi Chak (36°45'52.62"N, 50°20'01.08"E, 1787 m a.s.l.), 1♀, 21–28.vi.2010; **Mazandaran Province**, Noor, Faculty of Natural Resources and Marine Sciences (36°34'52.98"N, 52°02'45.78"E, -14 m b.s.l.), 1♀, 1♂, 08–22.v.2011, 3♀♀, 1♂, 05–27.vi.2011, 2♀♀, 16–25.ix.2011, 1♀, 26.ix–04.xii.2011; Chamestan, Gaznasara (36°16'56.82"N, 52°10'58.50"E, 2032 m a.s.l.), 1♀, 12–26.vii.2011, leg. M. Khayrandish.

**Distribution in Iran.** Ardabil (Masnadi-Yazdinejad & Jussila 2009), Isfahan (Barahoei et al. 2015; Zardouei Heydari et al. 2020), Kerman, North Khorasan, South Khorasan, Kermanshah (Zardouei Heydari et al. 2020), Razavi Khorasan (Barahoei et al. 2014) Mazandaran (Hooshyar et al. 2014; current study), Sistan & Baluchestan (Barahoei et al. 2012), West Azerbaijan (Mohammadi-Khoramabadi et al. 2020), Yazd (Zarepour et al. 2009), Alborz, Tehran, Qazvin and Guilan Provinces (current study).

**Zoogeographical distribution.** Palaearctic and Oriental (Yu et al. 2016; Riedel & Japoshvili 2025).

#### *Anomalon narinae* Zardouei & Rakhshani, 2020

**Material examined.** 4♀♀, **Hormozgan Province**: Minab, Chelo (27°10'30.39"N, 57°01'09.79"E, 16 m a.s.l.), 1♀, 20.iv–04.v.2012, 1♀, 04–18.v.2012, 1♀, 01–15.vi.2012, Zakin (27°53'7.32"N, 56°19'58.34"E, 1020 m a.s.l.), 1♀, 02–16.v.2012, leg. A. Amiri.

**Distribution in Iran.** Sistan & Baluchestan, Kerman (Zardouei Heydari et al. 2020), and Hormozgan Provinces (current study).

**Zoogeographical distribution.** West Palaearctic (Zardouei Heydari et al. 2020).

#### Genus *Barylypa* Foerster, 1869

**Type species:** *Anomalon genalis* (Thomson, 1892).

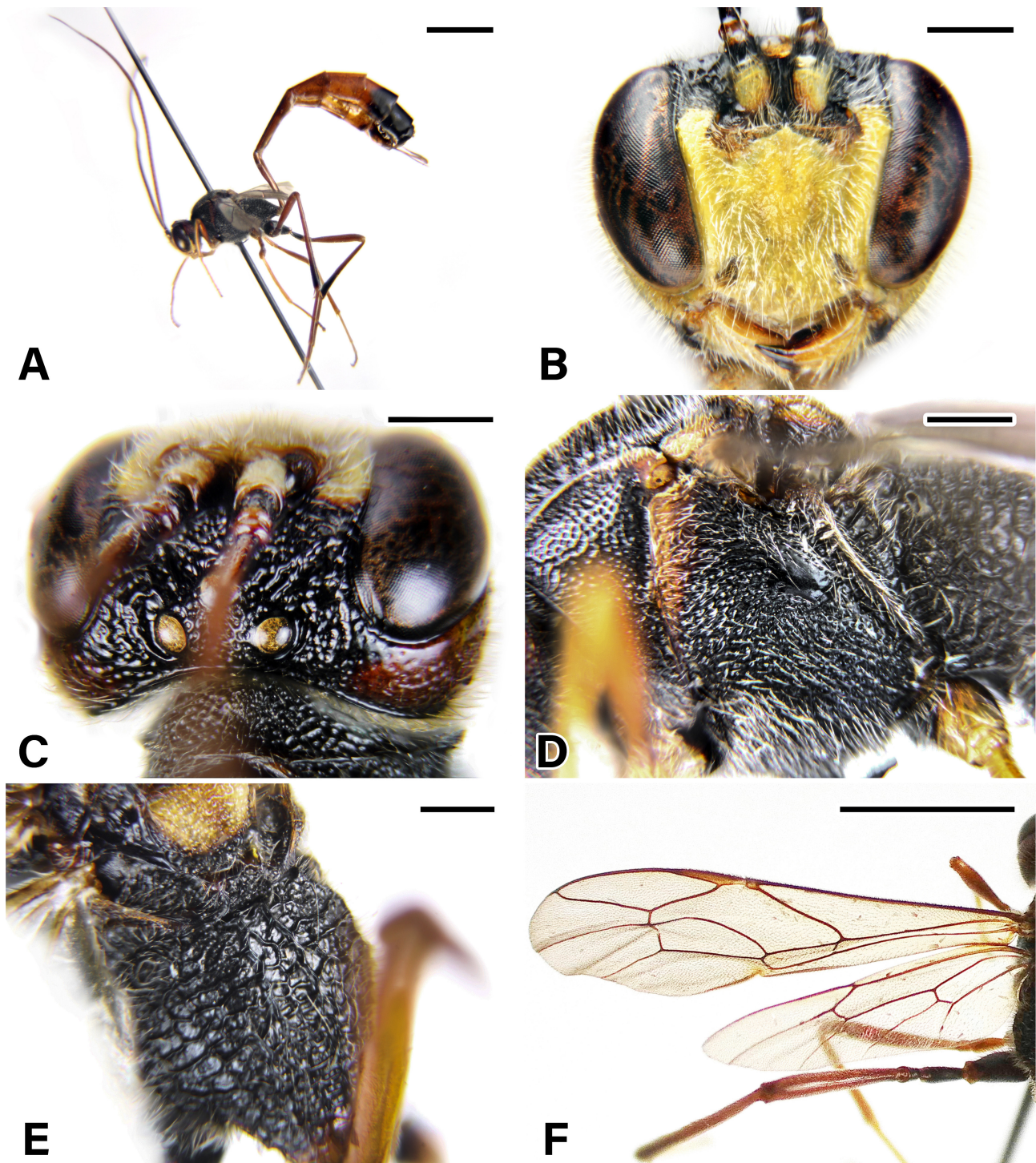
#### *Barylypa propugnator* (Foerster, 1855)

(Figs 2A–F)

**Material examined.** 1♀, 1♂, **Guilan Province**, Astaneh Ashrafiyeh, Eshman Kamachal (37°22'03.66"N, 49°57'57.84"E, -1 m b.s.l.), 1♂, 1♀, 21–28.vi.2010, leg. M. Khayrandish.

**Morphological characteristics.** Female, body length 17.4 mm (Fig. 2A); head and mesosoma with silvery pilosity; antennae with 56 flagellomeres; 1<sup>st</sup> flagellomere 4.5× as long as wide, middle flagellomeres 1.5× as long as wide; malar space 0.3× as wide as base of mandible; clypeus smooth and shiny, 1.9× as wide as high, apically with one medial tooth; face medially rugose-punctate, 1.25× as wide as high (Fig. 2B); compound eyes ventrally converging; frons reticulate-rugose, with a vertical carina; temple rugose-punctate, 0.7× width of compound eyes in dorsal view; OOL 1.7× as long as hind ocellus (Fig. 2C); mesoscutum punctate (interspaces less than diameter of a puncture), reticulate-rugose medially; scutellum slightly convex, strongly punctate (interspaces less than diameter of a puncture) with lateral carina;

epicnemial carina complete; mesopleuron coarsely punctate, speculum smooth and shiny (Fig. 2D); PTM weak in anterior to middle coxae; propodeum reticulate (Fig. 2E); fore coxae without ventral carina; fore and mid legs orange-red, except coxae basally black and apically yellow-orange; hind leg red-orange, except coxae, trochanters and dorsal side of trochantelli black, apical 0.3 of tibia dark brown, 1<sup>st</sup> tarsomere 3× as long as 2<sup>nd</sup> tarsomere; tegula yellow-orange, stigma orange-brown; hindwing vein Cu1 recurrent at apical 0.4 (Fig. 2F); metasomal tergites red, apical 0.6 of 5<sup>th</sup> tergite and 6<sup>th</sup> to 8<sup>th</sup> tergites dark brown, 2<sup>nd</sup> tergite with a dorsal dark brown stripe; ovipositor sheath 0.3× as long as hind tibia.



**Figure 2.** *Barylypa propugnator* (Foerster, 1855), female: A. Habitus; B. Face, frontal view; C. Head, dorsal view; D. Mesopleuron, lateral view; E. Propodeum, dorsal view; F. Wings, venation; Scales: A, F: 3 mm; B–E: 0.5 mm.

**Distribution in Iran.** Sistan & Baluchestan (Barahoei et al. 2012 as *B. rufa* (Habermehl, 1920), Razavi Khorasan (Barahoei et al. 2014), and Guilan Provinces (current study).

**Zoogeographical distribution.** Palaearctic (Yu et al. 2016).

**Note.** *Barylypa propugnator* (Foerster, 1855) was previously reported from three Provinces of Iran under synonymous name. Host records summarized by Yu et al. (2016) indicate that this species is an important biological control agent of several Lepidoptera. Morphological characters of this species are provided for the first time in Iran, serving as a fundamental reference for future conservation, biological, and ecological studies.

### ***Barylypa uniguttata* (Gravenhorst, 1829)**

**Material examined.** 8♀♀, **Guilan Province**, Rudsar County, Rahimabad district, Ghazi Chak (36°45'52.62"N, 50°20'01.08"E, 1787 m a.s.l.), 1♀, 11–18.iv.2010, 1♀, 18–25.iv.2010, leg. M. Khayrandish; **Qazvin Province**, Zereshk road (36°21'39.72"N, 50°03'55.56"E, 1541 m a.s.l.), 5♀♀, 03–17.v.2011, 1♀, 28.iv–04.v.2011, leg. A. Nadimi.

**Distribution in Iran.** Alborz (Klopfstein & Baur 2011), Guilan and Qazvin Provinces (current study).

**Zoogeographical distribution.** Palaearctic (Yu et al. 2016; Riedel & Japoshvili 2025).

### **Genus *Erigorgus* Foerster, 1869**

**Type species:** *Anomalon fibulator* (Gravenhorst, 1829).

### ***Erigorgus annulitarsis* (Thomson, 1892)**

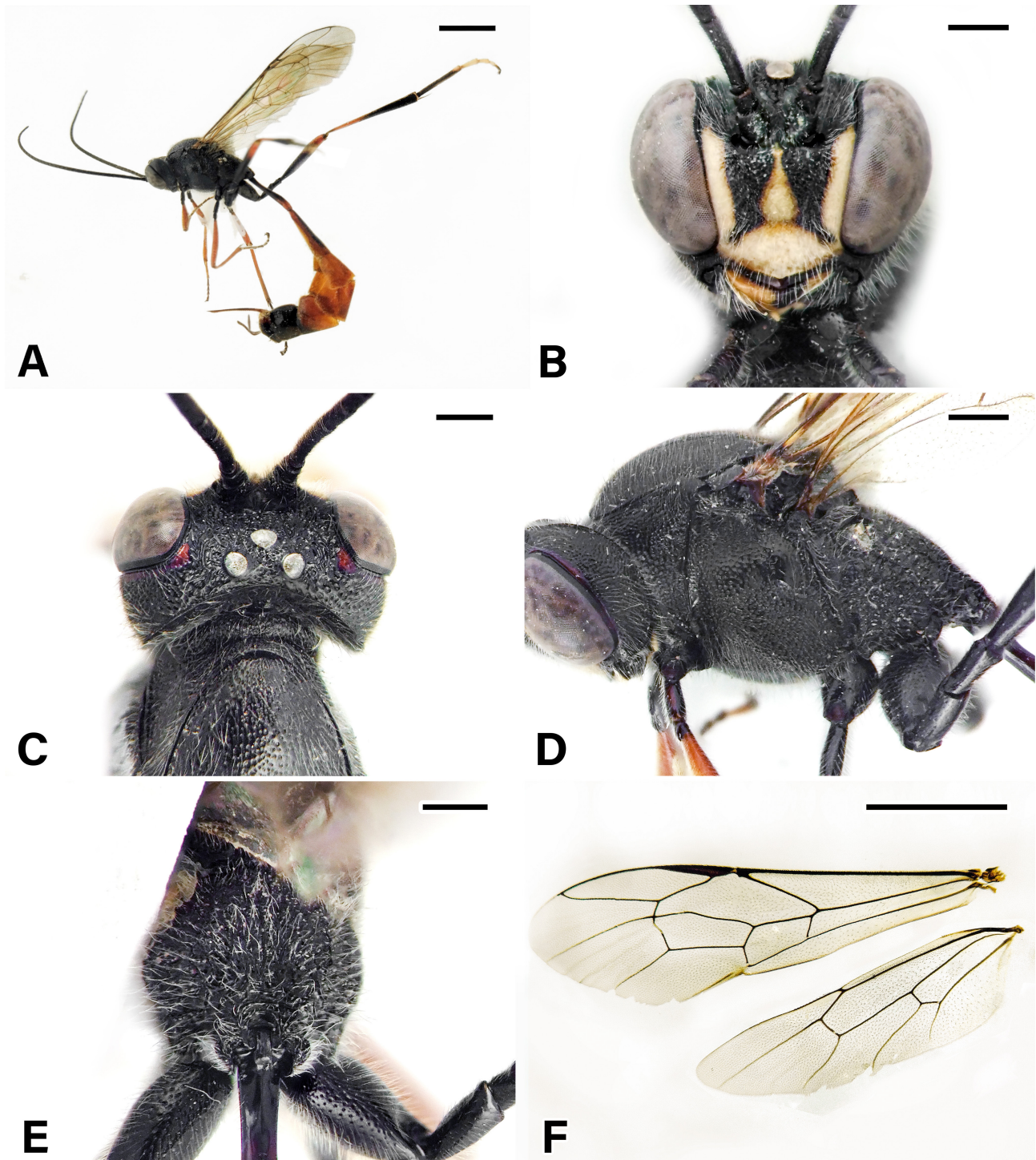
(Figs 3A–F)

**Material examined.** 2♀♀, 1♂, **Mazandaran Province**, Noor, Faculty of Natural Resources and Marine Sciences (36°34'52.98"N, 52°02'45.78"E, -14 m b.s.l.), 1♀, 24.v–29.vi.2011, leg. M. Khayrandish; **Alborz Province**, Chalous road, Sarziarat (35°55'10.38"N, 51°06'51.24"E, 1980 m a.s.l.), 1♀, 24.v–01.vi.2010, 1♂, 10–18.v.2010, leg. A. Nadimi.

**Morphological characteristics.** Female, body length 17.8–18 mm (Fig. 3A); head and mesosoma with dense silvery pilosity; antennae with 36–37 flagellomeres; 1<sup>st</sup> flagellomere 4.3× as long as wide, middle flagellomeres 1.2× as long as wide; malar space 0.2× as wide as base of mandible; clypeus punctate, shiny, 2× as wide as high, apically with one medial tooth; face punctate, 1.4× as wide as high (Fig. 3B); compound eyes ventrally converging; frons reticulate-rugose, with a weak vertical carina; temple rugose-punctate, 0.7× width of compound eye in dorsal view; OOL 1.8× as long as hind ocellus (Fig. 3C); mesoscutum punctate (interspaces greater than diameter of a puncture), smooth and shiny medially; scutellum slightly convex, punctate (interspaces equal to diameter of a puncture); epicnemial carina raised and lamellate, medially notched, joined with transverse part, pleural part obliterated; mesopleuron strongly punctate (interspaces less than diameter of a puncture); speculum smooth and shiny, with a few sparse punctures (Fig. 3D); PTM weak in anterior to middle coxae; propodeum reticulate-rugose (Fig. 3E); fore coxae without ventral carina; all coxae and trochanters black, fore and mid femora and tibiae red, fore and mid tarsi brown, hind femur black, apical half red; hind tibia red, basal half black; hind tarsus black, except 1<sup>st</sup> tarsomere apically and 2<sup>nd</sup> to 4<sup>th</sup> tarsomeres white, 1<sup>st</sup> tarsomere 3× as long as 2<sup>nd</sup> tarsomere; tegula black, forewing stigma dark brown, hindwings with vein Cu1 recurrent at mid-length (Fig. 3F); 1<sup>st</sup> metasomal tergite black, apically red, 2<sup>nd</sup> to 5<sup>th</sup> tergites red, 2<sup>nd</sup> tergite dorsally black, 5<sup>th</sup> tergite apically and 6<sup>th</sup> to 8<sup>th</sup> tergites black; ovipositor sheath 0.4× as long hind tibia.

**Distribution in Iran.** Alborz and Mazandaran Provinces (current study).

**Zoogeographical distribution.** West Palaearctic (Yu et al. 2016), and Iran (new record).



**Figure 3.** *Erigorgus annulitarsis* (Thomson, 1892), female: **A.** Habitus; **B.** Face, frontal view; **C.** Head, dorsal view; **D.** Mesopleuron, lateral view; **E.** Propodeum, dorsal view; **F.** Wings, venation; Scales: A, F: 3 mm; B–E: 0.5 mm.

### *Erigorgus cerinops* (Gravenhorst, 1829)

**Material examined.** 1♀, **Guilan Province**, Roodsar, Rahim Abad, Ghazi Chak (36°45'52.62"N, 50°20'01.08"E, 1787 m a.s.l.), 1♀, 24–31.v.2010, leg.: M. Khayrandish.

**Distribution in Iran.** Mazandaran (Hooshyar & Vafaei-Shoushtari 2013) and Guilan Provinces (current study).

**Zoogeographical distribution.** Palaearctic (Yu et al. 2016).

***Erigorgus fibulator* (Gravenhorst, 1829)**

**Material examined.** 3♀, 1♀, **Qazvin Province**, Loshan (36°4'14.58"N, 49°25'38.52"E, 295 m a.s.l.), 1♀, 04–13.iv.2011, leg. A. Nadimi; **Mazandaran Province**, Noor, Faculty of Natural Resources and Marine Sciences (36°34'52.98"N, 52°02'45.78"E, -14 m b.s.l.), 1♀, 08–22.v.2011; **Guilan Province**, Roodsar, Rahim Abad, Orkom (36°45'44.34"N, 50°18'11.88"E, 1201 m a.s.l.), 1♀, 13.iii–06.iv.2010, leg. M. Khayrandish.

**Distribution in Iran.** Mazandaran (Hooshyar & Vafaei-Shoushtari 2013), South Khorasan (Zardouei Heydari et al. 2019), Qazvin and Guilan Provinces (current study).

**Zoogeographical distribution.** Palaearctic (Yu et al. 2016).

***Erigorgus varicornis* (Thomson, 1894)**

(Figs 4A–F)

**Material examined.** 1♀, **Fars Province**, Eghlid, Dejkord (30°43'58.91"N, 51°56'55.10"E, 2171 m a.s.l.), 1♀, 16.viii.2013, leg. A. Amiri.

**Morphological characteristics.** Female, body length 18.3 mm (Fig. 4A); head and mesosoma with dense whitish pilosity; antennae with 38 flagellomeres; 1<sup>st</sup> flagellomere 4× as long as wide, middle flagellomeres 1.4× as long as wide; malar space 0.3× as wide as base of mandible; clypeus punctate, shiny, 2.4× as wide as high, apically with one medial tooth; face punctate, 1.5× as wide as high (Fig. 4B); compound eyes ventrally converging; frons reticulate-rugose, with a vertical carina; temple punctate, 0.7× width of compound eye in dorsal view; OOL 2× as long as hind ocellus (Fig. 4C); mesoscutum punctate (interspaces less than diameter of a puncture); scutellum almost flat, punctate (interspaces equal to diameter of a puncture); epicnemial carina slightly raised, joined with pleural part, obliterated in upper half, transverse part obliterated; mesopleuron strongly punctate (interspaces less than diameter of a puncture); speculum punctate (Fig. 4D); PTM obliterated anterior to middle coxae; propodeum reticulate-rugose (Fig. 4E); fore coxae without ventral carina; head black, face and clypeus yellow, antennal flagellomeres red; all coxae black, fore and mid legs orange-red, except coxae, hind trochanter black, remaining hind leg orange-red, except hind femur basally slightly black, apical 0.3 of hind tibiae black; hind tarsus yellowish-orange; tegula black; forewing stigma orange yellow; hindwing vein Cu1 recurrent at apical 0.6 (Fig. 4F); metasomal tergites orange-red except 2<sup>nd</sup> tergite with a black dorsal stripe and 5<sup>th</sup> to 8<sup>th</sup> tergites black; ovipositor sheath 0.3× as long as hind tibia.

**Distribution in Iran.** Fars Province (current study).

**Zoogeographical distribution.** West Palaearctic (Yu et al. 2016); Iran (new record).

**Genus *Heteropelma* Wesmael, 1849**

**Type species:** *Heteropelma calcator* Wesmael, 1849.

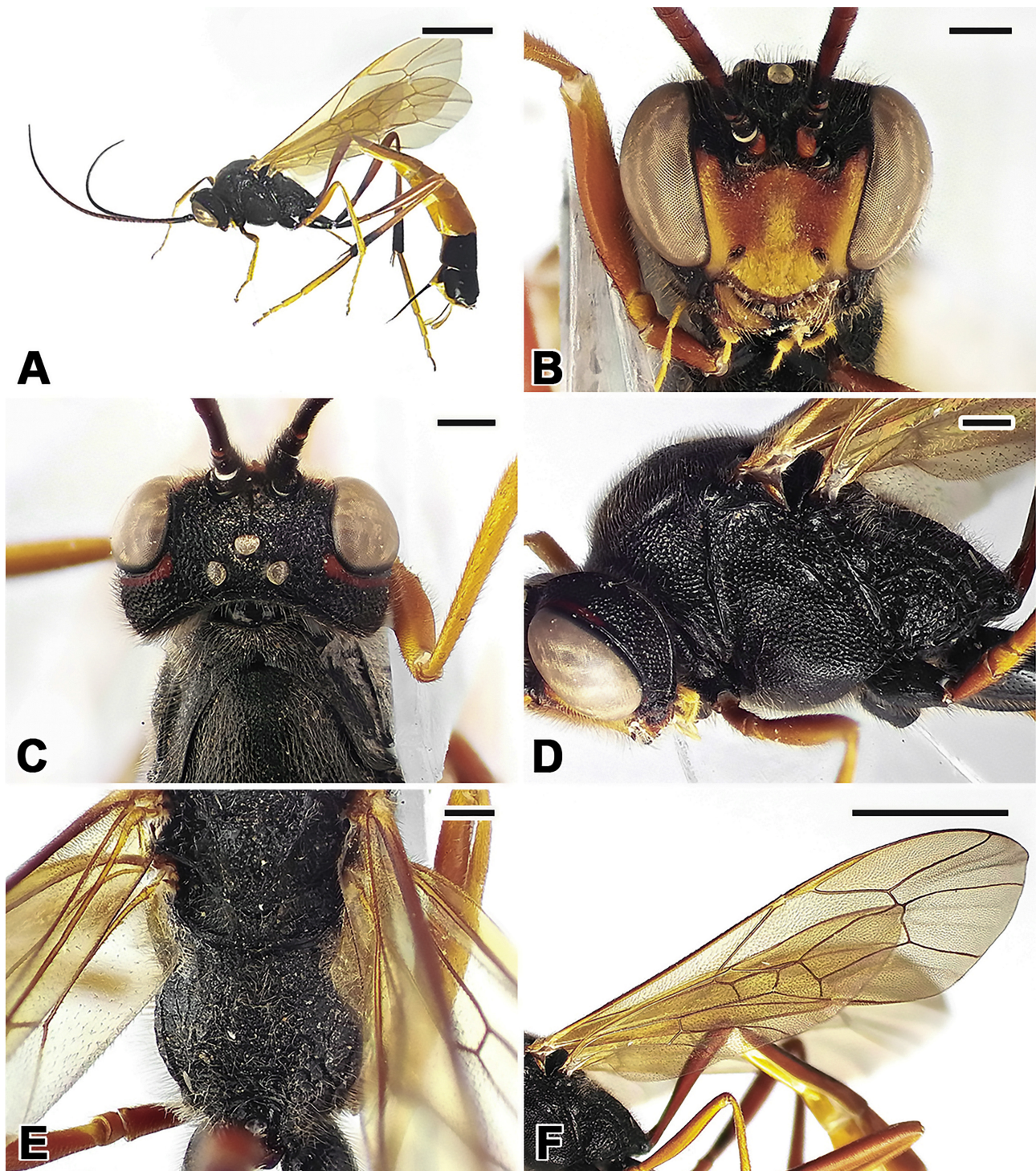
***Heteropelma megarthrum* (Ratzeburg, 1848)**

(Figs 5A–F)

**Material examined.** 3♀♀, **Guilan Province**, Rudsar County, Rahimabad District, Orkom (36°45'44.34"N, 50°18'11.88"E, 1201 m a.s.l.), 3♀♀, 08–15.vi.2010, leg. M. Khayrandish.

**Morphological characteristics.** Female, body length 15.5–15.8 mm (Fig. 5A); head and mesosoma with dense yellowish pilosity; antennae with 44–47 flagellomeres; 1<sup>st</sup> flagellomere 5.3× as long as wide, middle flagellomeres 1.4× as long as wide; malar space 0.3× as wide as base of mandible; clypeus shiny, 1.9× as wide as high, apically without tooth; face medially reticulate, 1.1× as wide as high (Fig. 5B); compound eyes ventrally converging; frons rugose, with a strongly raised vertical carina between antennal sockets; temple rugose-punctate, 0.5× width of compound eye in dorsal view; OOL 1.3× as long as hind ocellus (Fig. 5C); mesoscutum punctate (interspaces less than diameter of a puncture), strongly reticulate medially; scutellum slightly convex, reticulate; epicnemial carina raised and lamellate, medially deeply notched, joined with pleural part, transverse part not joined with epicnemial

carina, raised as a point posterior to fore coxae; mesopleuron strongly punctate medially, sparsely punctate ventrally; speculum smooth and shiny, with a few sparse punctures (Fig. 5D); PTM complete; propodeum reticulate-rugose (Fig. 5E); legs orange, except all coxae black; apical 0.3 of hind tibia black, 5<sup>th</sup> tarsomere of hind tarsus brown, 1<sup>st</sup> tarsomere 4.1× as long as 2<sup>nd</sup> tarsomere; tegula and forewings stigma orange-yellow; hindwings vein Cu1 recurrent at apical 0.7 (Fig. 5F); metasomal tergites red; 2<sup>nd</sup> tergite dorsally and 6<sup>th</sup> to 8<sup>th</sup> tergites black; ovipositor sheath 0.25× as long as hind tibia.

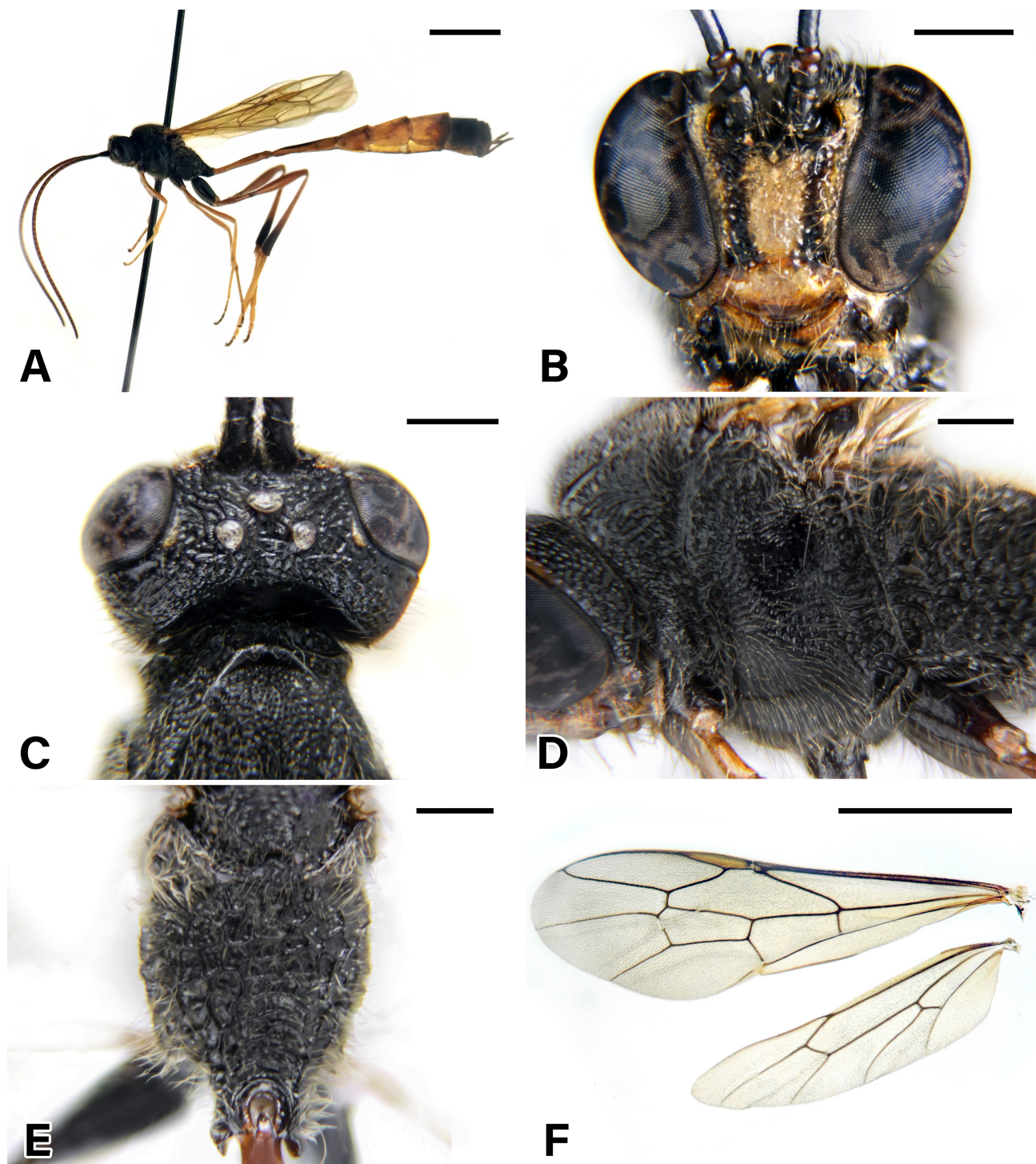


**Figure 4.** *Erigorgus varicornis* (Thomson, 1894), female: A. Habitus; B. Face, frontal view; C. Head, dorsal view; D. Mesopleuron, lateral view; E. Propodeum, dorsal view; F. Wings, venation; Scales: A, F: 3 mm; B–E: 0.5 mm.

**Distribution in Iran.** Golestan, Razavi Khorasan (Kolarov et al. 2024), and Guilan Provinces (current study).

**Zoogeographical distribution.** Palaearctic and Oriental (Yu et al. 2016; Riedel et al. 2023).

**Note.** This species is recorded for the second time from Iran and has a wide distribution in the Palaearctic and Oriental regions (Ghahari et al. 2026). Morphological characteristics of this species are described here for the first time from Iran to provide basic reference material for future studies.



**Figure 5.** *Heteropelma megarthrum* (Ratzeburg, 1848), female: A. Habitus, lateral view; B. Face, frontal view; C. Head, dorsal view; D. Mesopleuron, lateral view; E. Propodeum, dorsal view; F. Wings, venation; Scales: A, F: 3 mm; B–E: 0.5 mm.

## Genus *Therion* Curtis, 1829

**Type species:** *Ichneumon circumflexum* (Linnaeus, 1758).

### *Therion circumflexum* (Linnaeus, 1758)

(Figs 6A–F)

**Material examined.** 1♀, **Guilan Province**, Rudсар County, Rahimabad District, Ghazi Chak (36°45'52.62"N, 50°20'01.08"E, 1787 m a.s.l.), 1♀, 07–14.vi.2010, leg. M. Khayrandish.

**Morphological characteristics.** Female, body length 21.5 mm (Fig. 6A); head and mesosoma with dense yellowish pilosity; antennae with 56 flagellomeres; 1<sup>st</sup> flagellomere 3.3× as long as wide, middle flagellomeres 1.2× as long as wide; malar space 0.5× as wide as base of mandible; clypeus punctate, shiny, 2.2× as wide as high, apically without tooth; face punctate-reticulate, 1.7× as wide as high (Fig. 6B); compound eyes ventrally converging; frons rugose, with a raised vertical carina between antennal sockets; temple rugose, 0.7× width of compound eye in dorsal view; OOL 2× as long as hind ocellus (Fig. 6C); mesoscutum punctate (interspaces less than diameter of a puncture); scutellum convex, punctate; epicnemial carina raised ventrally, medially slightly notched, joined with pleural part, transverse part not joined with epicnemial carina, slightly raised as a point posterior to fore coxae; mesopleuron and speculum strongly punctate (Fig. 6D); PTM weak in anterior to middle coxae; propodeum reticulate-rugose (Fig. 6E); legs orange-red, except all coxae, apical half of hind femora, and apical 0.3 of hind tibia black; 1<sup>st</sup> tarsomere of hind tarsus 2.6× as long as 2<sup>nd</sup> tarsomere; tegula and fore wing stigma orange-yellow; hindwings vein Cu1 recurrent at the middle (Fig. 6F); metasomal tergites 1–4 red, 2<sup>nd</sup> tergite dorsally and 5<sup>th</sup> to 8<sup>th</sup> tergites black; ovipositor sheath 0.2× as long as hind tibia.

**Distribution in Iran.** Guilan Province (current study).

**Zoogeographical distribution.** Palaearctic, Oriental, and Nearctic (Yu et al. 2016; Riedel et al. 2018; 2023); Iran (**new record**).

## Genus *Trichomma* Wesmael, 1849

**Type species:** *Trichomma fulvidens* Wesmael, 1849).

### *Trichomma occisor* Habermehl, 1909

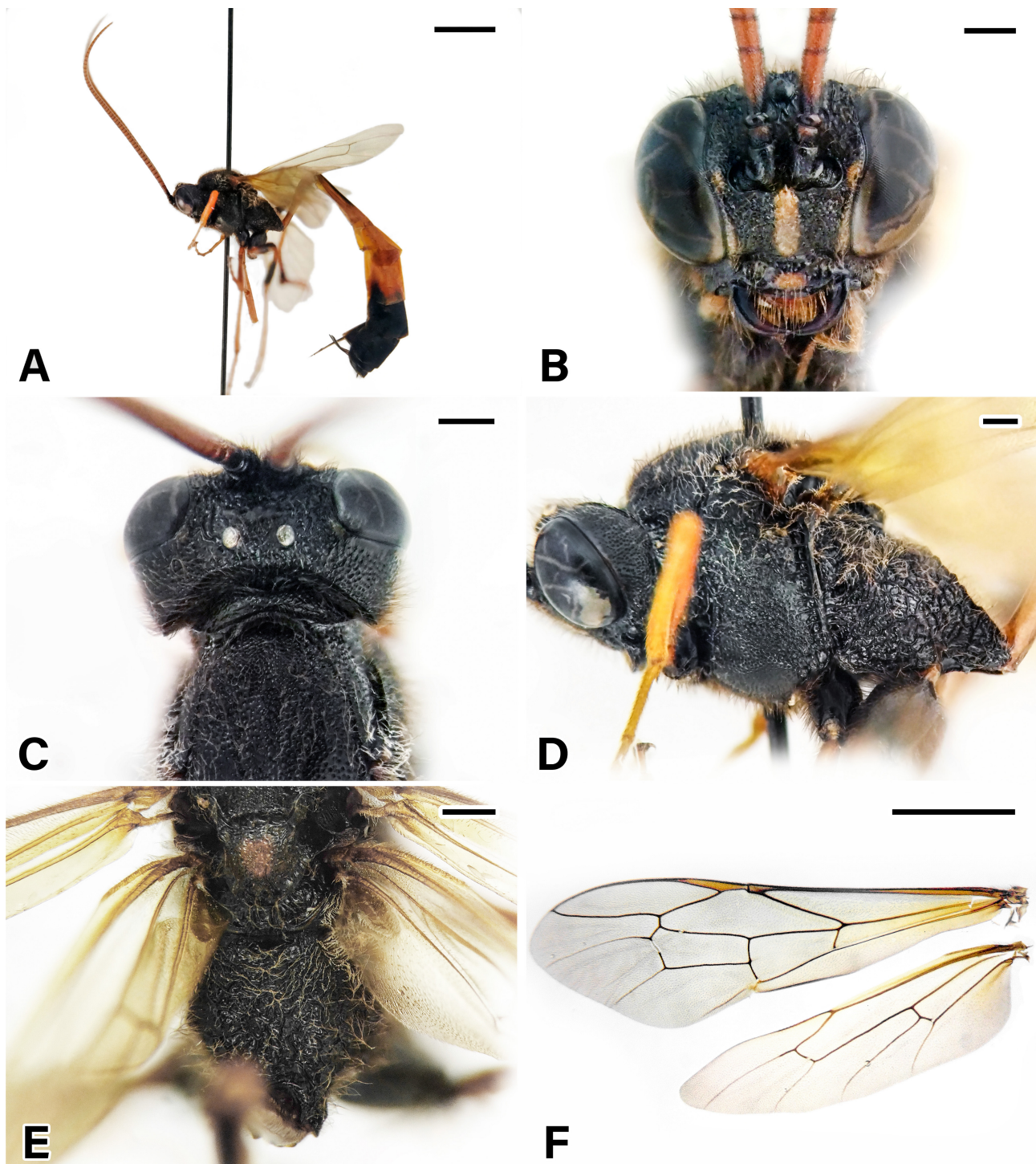
(Figs 7A–F)

**Material examined.** 1♀, **Mazandaran Province**, Noor, Chamestan, Tangehvaz (36°21'55.02"N, 52°06'10.74"E, 692 m a.s.l.), 1♀, 26.vii–16.viii.2011, leg. M. Khayrandish.

**Morphological characteristics.** Female, body length 11 mm (Fig. 7A); head and mesosoma with dense yellowish pilosity; antennae with 44 flagellomeres; 1<sup>st</sup> flagellomere 3.6× as long as wide, middle flagellomeres 1.2× as long as wide; malar space 0.2× as wide as base of mandible; clypeus smooth and shiny, with a few sparse punctures, 1.5× as wide as high, apically without tooth; face punctate, 0.7× as wide as high (Fig. 7B); compound eyes ventrally strongly converging; frons reticulate-rugose; temple punctate, 0.5× width of compound eye in dorsal view; OOL 1.3× as long as compound eye width (Fig. 7C); mesoscutum punctate (interspaces less than diameter of a puncture), rugose medially; scutellum convex, reticulate; epicnemial carina raised ventrally, joined with pleural part; transverse part not joined with epicnemial carina, slightly developed; mesopleuron strongly punctate; upper part of mesopleuron striate (Fig. 7D); PTM complete; propodeum reticulate-rugose (Fig. 7E); fore and mid legs orange-red; hind leg red, apical 0.4 of hind tibia brown; 1<sup>st</sup> tarsomere of hind tarsus 2.2× as long as 2<sup>nd</sup> tarsomere; tegula yellow; stigma brown; hindwings vein Cu1 not recurrent (Fig. 7F); metasomal tergites red; 2<sup>nd</sup> tergite and 5<sup>th</sup> to 8<sup>th</sup> tergites dorsally black; ovipositor sheath 1.1× as long as hind tibia.

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

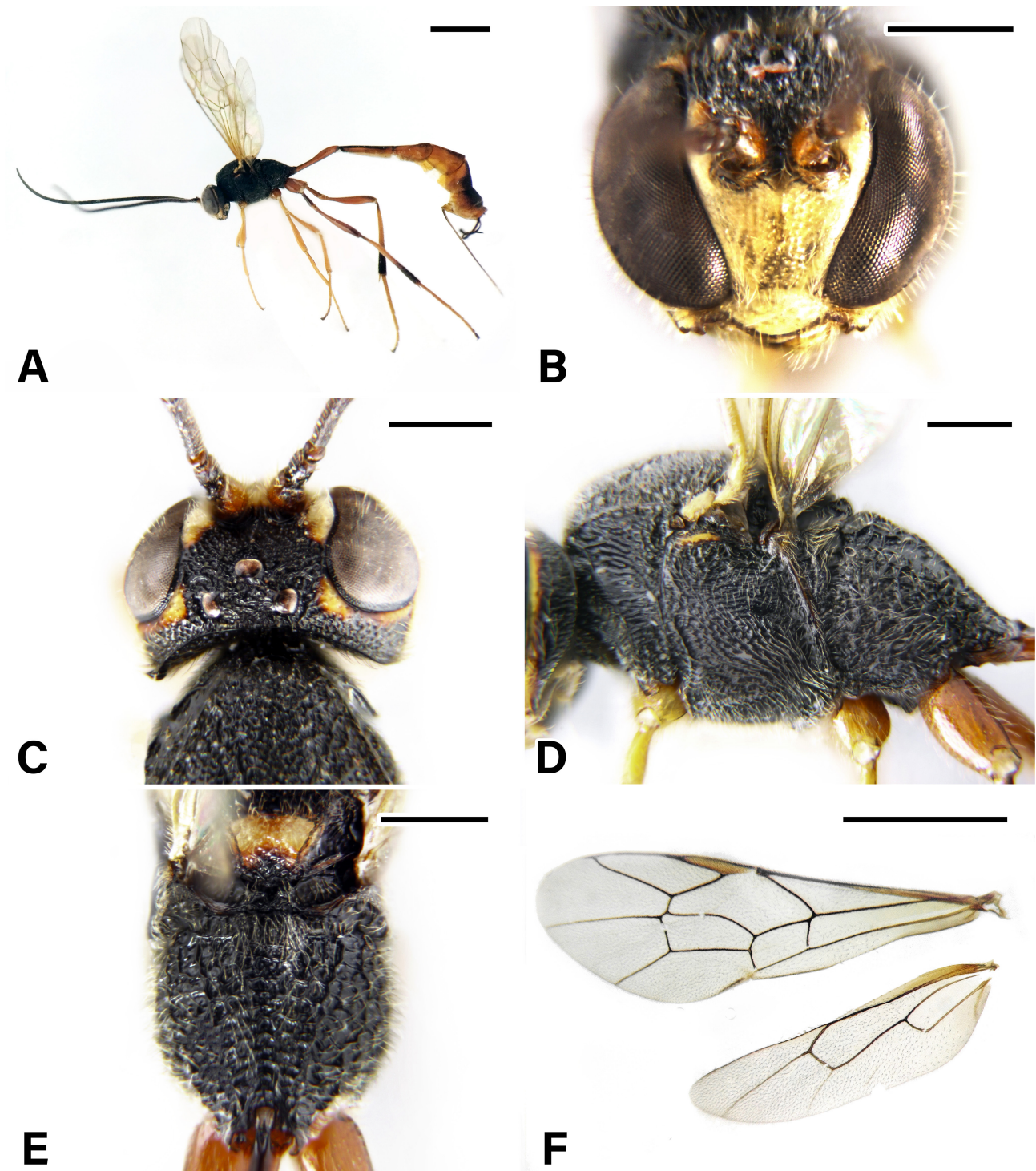
**Zoogeographical distribution.** Palaearctic (Yu et al. 2016); Iran (**new record**).



**Figure 6.** *Therion circumflexum* (Linnaeus, 1758), female: **A.** Habitus, lateral view; **B.** Face, frontal view; **C.** Head, dorsal view; **D.** Mesopleuron, lateral view; **E.** Propodeum, dorsal view; **F.** Wings, venation; Scales: A, F: 3 mm; B-E: 0.5 mm.

## DISCUSSION

In this study, 968 specimens were examined, representing 14 species from 7 genera. Among these, four species are newly recorded for the Iranian fauna, along with 18 new provincial records. Additionally, morphological characters and illustrations are provided for three species: *Agrypon flaveolatum* (Gravenhorst, 1807), *Barylypa propugnator* (Foerster, 1855), and *Heteropelma megarthrum* (Ratzeburg, 1848), as such data were previously unavailable for these taxa in the literature.



**Figure 7.** *Trichomma occisor* Habermehl, 1909, female: A. Habitus, lateral view; B. Face, frontal view; C. Head, dorsal view; D. Mesopleuron, lateral view; E. Propodeum, dorsal view; F. Wings, venation; Scales: A, F: 2 mm; B–E: 0.5 mm.

The results revealed that 912 specimens (94.21%) belonged to a single species, *Anomalon cruentatum*. The remaining 12 species were each represented by fewer than 20 specimens, of which several species were known from only a single individual. A similar pattern was reported in a recent study on Ichneumonidae in Georgia using Malaise traps (Riedel & Japoshvili 2026), where many species were also represented by singletons. This phenomenon is likely related to the sampling method. Previous studies have indicated that some Anomaloniinae wasps are nocturnal (Alvarado 2018), suggesting that

light traps would be more effective than Malaise traps for collecting adults of these wasps. *Anomalon cruentatum*, was by far the most dominant and widespread species across the country. Previous studies show that this parasitoid attacks a wide range of Lepidoptera (Yu et al. 2016; Ghahari et al. 2026). Given its abundance and broad host range, further research on its biology, ecology, and potential role in biological control – through conservation, augmentation, and mass rearing – is recommended.

The known Iranian fauna of the subfamily Anomaloninae now comprises 50 species in 13 genera. When compared with neighbouring countries, these figures are notable: Russia (68 species, 16 genera), Azerbaijan (15 species, 6 genera), Turkmenistan (11 species, 6 genera), Pakistan (7 species, 4 genera), Afghanistan (6 species, 2 genera), Armenia (3 species, 3 genera), Syria (1 species, 1 genus) and Iraq (no records) (Yu et al. 2016; Khalaim 2019; Youssef & Lotfalizadeh 2021; Ghahari et al. 2026). This disparity highlights the need for more extensive and systematic sampling across Iran's ecosystems, a point emphasized in previous studies (Zardouei Heydari et al. 2020). *Agrypon flaveolatum* (Gravenhorst, 1807) is a well-known parasitoid of the winter moth, *Operophtera brumata* (Linnaeus, 1758) (Lepidoptera: Geometridae), a significant forest pest. Its importance in biological control has been well documented in several studies (van San & Spitzer 1993; Roland 1994; Vindstad et al. 2010, 2013; Schott et al. 2012). Although *O. brumata* was previously reported from Mazandaran Province and suspected to occur more widely in northern Iran (Rajaei et al. 2010), our record of its parasitoid from Guilan Province further supports a broader distribution of the host in this region. Our findings also help clarify the distributions for *Anomalon narinae*, which was recently described from southern Iran (Sistan & Baluchestan and Kerman Provinces) (Zardouei Heydari et al. 2020). The present study confirms its apparent restriction to southern Iran and provides a new record from Hormozgan Province. *Erigorgus annulitarsis* (Thomson, 1892) was previously known only from Germany, Hungary, and Sweden (Dalla Torre, 1902), with one subsequent record from the Middle East (Horstmann, 2001). *Host information for Erigorgus annulitarsis is unavailable*, although other members of the genus are known to parasitize Lepidoptera in the families Geometridae, Erebidae, Noctuidae, and Nymphalidae (Yu et al. 2016).

For widely distributed species, we highlight relevant Iranian host associations. *Heteropelma megarthrum* (Ratzeburg, 1848), which occurs in both the Palaearctic and Oriental regions (Yu et al. 2016), has only two confirmed hosts present in Iran: *Araschnia levana* (Linnaeus, 1758) and *Sphinx pinastri* Linnaeus, 1758 (Lepidoptera: Nymphalidae, Sphingidae, respectively) are confirmed to occur in Iran (Yu et al. 2016; Rajaei & Karsholt 2023). Similarly, *Therion circumflexum* (Linnaeus, 1758) attacks several lepidopteran species recorded in Iran, including *Lasiocampa trifolii* (Denis & Schiffermüller, 1775) (Lasiocampidae), *Ectropis crepuscularia* (Denis & Schiffermüller, 1775) and *Noctua pronuba* Linnaeus, 1758 (Noctuidae), and *S. pinastri* (Sphingidae) (Yu et al. 2016; Rajaei & Karsholt 2023). Finally, among the known hosts of *Trichomma occisor* Habermehl, 1909, only *Rhyacionia buoliana* (Denis & Schiffermüller) 1775 and *Malacosoma neustria* (Linnaeus, 1758) have been confirmed from Iran (Yu et al. 2016; Rajaei & Karsholt 2023; Pisciă 2005).

#### AUTHOR'S CONTRIBUTION

The authors confirm their contribution to the paper as follows: Z. Banani: Taxonomic examination and comparison of specimens, identification, data collection, photography, drafting the manuscript; A.A. Talebi: Conceptualization, fund acquisition, curation of the specimens, and revising the manuscript; A. Mohammadi-Khoramabadi: Identification, drafting, and revising the manuscript; A. Feizi: Identification, drafting, and revising the manuscript. All authors read and approved the final version of the manuscript.

#### FUNDING

This work was financially supported by Tarbiat Modares University, Tehran, Iran.

#### AVAILABILITY OF DATA AND MATERIAL

The specimens listed in this study are deposited in the Tarbiat Modares University Collection (TMUC), and are available from the curator upon request.

#### ETHICS APPROVAL AND CONSENT TO PARTICIPATE

This study only included arthropod material, and all required ethical guidelines for the treatment and use of animals were strictly adhered to in accordance with international, national, and institutional regulations. No human participants were involved in any studies conducted by the authors for this article.

#### CONSENT FOR PUBLICATION

Not applicable.

#### CONFLICT OF INTERESTS

The authors declare that there is no conflict of interest regarding the publication of this paper.

#### GENERATIVE AI STATEMENT

No generative AI tools were used in the preparation of this paper.

#### ACKNOWLEDGMENTS

We extend our gratitude to the Department of Entomology at Tarbiat Modares University, Tehran, Iran, for providing financial support for this research. We thank Dr. Ahmad Nadimi and Dr. Mohammad Khayrandish for collecting the core material for this study.

#### REFERENCES

- Achterberg, C. van. (2009) Can Townes type Malaise traps be improved some recent developments. *Entomologische Berichten*, 69 (4), 129–135.
- Alvarado, M. (2018) Nocturnal *Aphanistes* (Hymenoptera: Ichneumonidae: Anomaloniinae) in the Neotropical region, with the description of five new species. *Zootaxa*, 4369 (2), 221–236. <https://doi.org/10.11646/zootaxa.4369.2.4>
- Atanasov, A.Z. (1981) A guide to the insects of the European part of the USSR Hymenoptera, Ichneumonidae. Subfamily Anomaloniinae. (in Russian). *Opredeliteli Faune SSSR*, 129, 432–451.
- Barahoei, H., Fathabadi, K., Rakhshani, E. & Moradpour, H. (2014) A survey on the fauna of Ichneumonidae (Hymenoptera) of Khorasan-e-Razavi province. *Iranian Journal of Animal Biosystematics*, 10 (2), 145–160.
- Barahoei, H., Rakhshani, E. & Riedel, M. (2012) A checklist of Ichneumonidae (Hymenoptera: Ichneumonoidea) from Iran. *Iranian Journal of Animal Biosystematics*, 8 (2), 83–132.
- Barahoei, H., Nader, E. & Rakhshani, E. (2015) A survey on Ichneumonidae of Isfahan province, central Iran. *Journal of Crop Protection*, 4 (2), 157–166.
- Broad, G.R. (2014) A new, endemic genus of Anomaloniinae (Hymenoptera, Ichneumonidae) from St Helena. *Journal of Hymenoptera Research*, 41, 31–45. <https://doi.org/10.3897/JHR.41.8099>
- Broad, G.R., Shaw, M.R. & Fitton, M.G. (2018) *Ichneumonid Wasps (Hymenoptera: Ichneumonidae): their Classification and Biology. Handbooks for the Identification of British Insects*, Royal Entomological Society, London, 7 (12), 1–418. <https://doi.org/10.1079/9781800625471.0000>
- Dalla Torre, C.G. de. (1902) *Catalogus Hymenopterorum* (Vol. III). Trigonidae, Megalyridae, Stephanidae, Ichneumonidae, Agriotypidae, Evaniidae, Pelecinidae. Guilelmi Engelmann. Lipsiae. 1901, 1–544. 1902, 545–1141.
- Darvish Mojeni, T. & Šedivy, J. (2001) New report of parasitoid ichneumonid wasps of cotton bollworm *Helicoverpa armigera* (Hub.) (Lep. Noctuidae) in Iran. *Journal of Entomological Society of Iran*, 21 (1), 107–108.
- Dasch, C.E. (1984) Ichneumon-flies of America north of Mexico: 9. Subfamilies Theriinae and Anomaloniinae. *Memoirs of the American Entomological Institute*, 36, 1–610.
- Eady, R.D. (1968) Some illustrations of microsculpture in the Hymenoptera. *Proceedings of the Royal Entomological Society of London. Series A, General Entomology*. Oxford, UK, 43 (4–6), pp. 66–72. <https://doi.org/10.1111/j.1365-3032.1968.tb01029.x>
- Gauld, I.D. (1978) A revision of the Anomaloniinae (Hymenoptera: Ichneumonidae) of Melanesia I. The genera *Anomalon* Panzer to *Aphanistes* Förster. *Bulletin of Entomological Research*, 68, 501–519. <https://doi.org/10.1017/S000748530009482>
- Gauld, I.D. (1980) A synopsis of the Anomaloniinae (Hymenoptera: Ichneumonidae) of sub-Saharan Africa with special reference to species of potential economic importance. *Bulletin of Entomological Research*, 70 (1), 33–41. <https://doi.org/10.1017/S000748530009743>
- Gauld, I.D. (1984) *An Introduction to the Ichneumonidae of Australia*. British Museum (Natural History) Publication No.895, British Museum (Natural History), London, 413 pp.
- Gauld, I.D. (1991) The Ichneumonidae of Costa Rica. *Memoirs of the American Entomological Institute*, 47, 1–589.
- Gauld, I.D. & Mitchell, P. A. (1977) *Ichneumonidae: Orthopelmatinae and Anomaloniinae. Handbooks for the Identification of British Insects*, 7(2), 1–29. Royal Entomological Society, London.

- Gauld, I.D., Wahl, D., Bradshaw, K., Hanson, P. & Ward, S. (1997) The Ichneumonidae of Costa Rica, 2. Introduction and keys to species of the smaller subfamilies, Anomaloninae, Ctenopelmatinae, Diplazontinae, Lycorininae, Phrudinae, Tryphoninae (excluding Netelia) and Xoridinae, with an appendices on the Rhyssinae. *Memoirs of the American Entomological Institute*, 57, 1–485.
- Ghahari, H., Shimizu, S., Gadallah, N.S., Abbasipour, H., Schwarz, M. & Kolarov, J. (2026) Subfamily Anomaloninae Viereck, 1918. In: Ghahari, H., Gadallah, N.S. & Shaw, S.R. (eds) *Darwin Wasps of the Middle East* (Hymenoptera: Ichneumonidae). Springer, Cham, pp. 115–154. [https://doi.org/10.1007/978-3-031-88200-5\\_6](https://doi.org/10.1007/978-3-031-88200-5_6)
- Hooshyar, H. & Vafaei-Shoushtari, R. (2013) Faunistic study of ichneumon wasps (Hym. Ichneumonidae) from Mazandaran province, Iran. In *Proceedings of The Second International Conference on Agriculture and Natural Resources*, December 25–26, 2013. Razi University, Kermanshah, Iran. pp. 914–917.
- Hooshyar, H., Vafaei-Shoushtari, R. & Barimai-Varandi, H. (2012) Faunistic study of Ichneumon wasps (Hym., Ichneumonidae) from Mazandaran province, Iran. In Sarafrazi, A., Asef, M.R., Mozhdehi, M., Mozhdehi, M., Solhjoui Fard, S. & Abdollahi, T. (eds) *Proceedings of the 20th Iranian Plant Protection Congress*. August 25–28, 2012. Shiraz University, Vol 1, p. 224.
- Hooshyar, H., Vafaei-Shoushtari, R. & Barimani-Varandi, H. (2014) Faunistic study of Ichneumon wasps (Hym., Ichneumonidae) from Mazandaran province, Iran. *IAU Entomological Research Journal*, 2 (6), 191–202.
- Horstmann, K. (2001) Ichneumonidae. In: Dathe, H.H., Taeger, A. & Blank, S.M. (eds) *Verzeichnis der Hautflügler Deutschlands* (*Entomofauna Germanica* 4). Entomologische Nachrichten und Berichte (Dresden), Beiheft, 7, 69–103.
- Khalaim, A.I. (2019) Subfamily Anomaloninae. In: Belokobylskij S.A., Samartsev K.G., Il'inskaya A.S. (eds) *Annotated catalogue of the Hymenoptera of Russia. Volume II. Apocrita: Parasitica. Proceedings of the Zoological Institute of the Russian Academy of Sciences. Supplement 8*. Zoological Institute RAS, St Petersburg, pp. 344–349.
- Klopstein, S. & Baur, H. (2011) Catalogue of the type specimens of Ichneumonidae (Hymenoptera) in the Jacques F. Aubert collection at the Musée de Zoologie, Lausanne, Switzerland. *Zootaxa*, 3081, 1–90. <https://doi.org/10.11646/zootaxa.3081.1.1>
- Kolarov, J. & Ghahari, H. (2005) A catalogue of Ichneumonidae (Hymenoptera) from Iran. *Linzer biologische Beiträge*, 37, 503–532.
- Kolarov, J., Gadallah, N. S., Ghahari, H. & Jussila, R. (2024) New and little-known species of Ichneumonidae (Hymenoptera) for the Iranian fauna. *Journal of the Entomological Research Society*, 26 (3), 465–476. <https://doi.org/10.51963/jers.v26i3.2708>
- Masnadi-Yazdinejad, A. (2010) The ichneumonid parasitoids (Hym., Ichneumonidae) of *Yponomeuta malinellus* Zeller (Lepidoptera: Yponomeutidae) in Iran. In: Melika, G. (ed.) *Proceedings of the 7th International Congress of Hymenopterists*. June 20–26, 2010. Koszeg, Hungary, p. 97.
- Masnadi-Yazdinejad, A. & Jussila, R. (2009) Ichneumonidae (Hymenoptera) from Iran, with new records. *Entomologica Fennica*, 20 (1), 3–10.
- Matsumura, S. (1926) On the five species of *Dendrolimus injurious* to conifers in Japan, with their parasitic and predaceous insects. *Journal of the College of Agriculture, Hokkaido Imperial University*, 18, 1–42.
- Mohammadi-Khoramabadi, A., Lotfalizadeh, H. & Schwarz, M. (2020) New records of the family Ichneumonidae (Hymenoptera, Ichneumonoidea) to the fauna of Iran. *Journal of Insect Biodiversity and Systematics*, 6 (3), 229–237. <https://doi.org/10.52547/jibs.6.3.229>
- Pisică, C. (2005) New contributions to the knowledge of the ichneumonids (Hym. Ichneum.) which parasitise the phytophagous insects. In: *Lucrările simpozionului "Entomofaună și rolul lor în păstrarea echilibrului natural"*, Universitatea "Al.I. Cuza" Iași. 19–28.
- Rajaei, H. & Karsholt, O., eds. (2023) *Lepidoptera Iranica. Integrative Systematics: Stuttgart Contributions to Natural History*, 6, I–XVI. <https://doi.org/10.18476/2023.997558.0>
- Rajaei, H., Abaii, M. & Hausmann, A. (2010) First record of the winter moth *Operophtera brumata* (Linnaeus, 1758) (Lepidoptera: Geometridae) in northern Iran. *Iranian Journal of Animal Biosystematics (IJAB)*, 6(2), 61–66.
- Riedel, M. & Japoshvili, G. (2025) Notes on some Darwin wasps (Hymenoptera: Ichneumonidae), new records for the fauna of Sakartvelo (Georgia). *Linzer biologische Beiträge*, 57 (1), 311–341.
- Riedel, M. & Japoshvili, G. (2026) New contribution to the Darwin wasps (Hymenoptera: Ichneumonidae) from Vashlovani National Park, Georgia (Sakartvelo), with description of two new species. *Journal of Insect Biodiversity and Systematics*, 12 (2), 337–356. <https://doi.org/10.48311/jibs.12.02.337>
- Riedel, M., Diller, E. & Japoshvili, G. (2018) The Ichneumonid fauna (Hymenoptera: Ichneumonidae) of Lagodekhi Reserve, Sakartvelo (Georgia), with descriptions of four new species. *Linzer Biologische Beiträge*, 50 (2), 1447–1507.
- Riedel, M., Pénigot, W., Schwarz, M., Diller, E., Johannsson, N. & Japoshvili, G. (2023) Darwin wasps (Hymenoptera, Ichneumonidae) of the Kintrishi National Park, Sakartvelo (Georgia), with descriptions of six new species. *Linzer biologische Beiträge*, 55 (1), 61–153.
- Roland, J. (1994) After the decline: What maintains low winter moth density after successful biological control? *Journal of Animal Ecology*, 63 (2), 392–398. <https://doi.org/10.2307/5556>
- Scaramozzino, P.L., Di Giovanni, F., Loni, A., Ricciardi, R. & Lucchi, A. (2018) Updated list of the insect parasitoids (Insecta, Hymenoptera) associated with *Lobesia botrana* (Denis & Schiffermüller, 1775) (Lepidoptera, Tortricidae) in Italy. 2. Hymenoptera, Ichneumonidae, Anomaloninae and Campopleginae. *ZooKeys*, 772, 47–95. <https://doi.org/10.3897/zookeys.772.25288>

- Schnee, H. (2008) The Anomaloninae of the Arnold Forster collection - type revision and faunistic remarks (Hymenoptera, Ichneumonidae). *Die Anomaloninae der Sammlung Arnold Forster - Typenrevision und faunistische Anmerkungen* (Hymenoptera, Ichneumonidae). *Beitraege zur Entomologie*, 58 (2), 249–266.
- Schnee, H. (2014) Anomaloninae aus Israel und Palästina mit Beschreibung einer neuen Anomalon-Art (Hymenoptera: Ichneumonidae). *Entomologische Zeitschrift*, 124 (2), 97–107.
- Schott, T., Ims, R. A., Hagen, S. B. & Yoccoz, N. G. (2012) Sources of variation in larval parasitism of two sympatrically outbreaking birch forest defoliators. *Ecological Entomology*, 37 (6), 471–479.  
<https://doi.org/10.1111/j.1365-2311.2012.01386.x>
- Sheng, M.-L., Schönitzer, K. & Sun, S.-P. (2012) A new genus and species of Anomaloninae (Hymenoptera, Ichneumonidae) from China. *Journal of Hymenoptera Research*, 27, 37–45. <https://doi.org/10.3897/jhr.27.2574>
- Uchida, T. (1954) Vier neue Schlufwespen als Schmarotzer der Tagfalter (Hym. Ichneumonidae). *Insecta matsumurana*, 18, 67–72.
- van San, N. & Spitzer, K. (1993) Isolated populations of the winter moth, *Operophtera brumata* (Lepidoptera: Geometridae), their heavy metal content and parasitism. *European Journal of Entomology*, 90 (3), 311–321.
- Veijalainen, A., Sääksjärvi, I. E., Eewin, T.L., Gómez, I.C. & Longino, J.T. (2013) Subfamily composition of Ichneumonidae (Hymenoptera) from western Amazonia: Insights into diversity of tropical parasitoid wasps. *Insect Conservation and Diversity*, 6, 28–37. <https://doi.org/10.1111/j.1752-4598.2012.00185.x>
- Vindstad, O.P.L., Hagen, S.B., Schott, T. & Ims, R.A. (2010) Spatially patterned guild structure in larval parasitoids of cyclically outbreaking winter moth populations. *Ecological Entomology*, 35 (4), 456–463.  
<https://doi.org/10.1111/j.1365-2311.2010.01201.x>
- Vindstad, O.P.L., Schott, T., Hagen, S.B., Jepsen, J.U., Kapari, L. & Ims, R.A. (2013) How rapidly do invasive birch forest geometrids recruit larval parasitoids? Insights from comparison with a sympatric native geometrid. *Biological Invasions*, 15 (7), 1573–1589. <https://doi.org/10.1007/s10530-012-0393-8>
- Ward, D.F. (2015) Review of the Anomaloninae (Hymenoptera: Ichneumonidae) from New Zealand with a description of a new genus and two new species. *New Zealand Entomologist*, 38, 58–66. <https://doi.org/10.1080/00779962.2014.985418>
- Yu, D.S., van Achterberg, C. & Horstmann, K. (2016) Taxapad 2016, Ichneumonoidea 2015. Database on flash-drive. [www.taxapad.com](http://www.taxapad.com), Nepean, Ontario, Canada.
- Youssef, R.M. & Lotfalizadeh, H. (2021) First record of the genus *Anomalon* Panzer, 1804 (Hymenoptera: Ichneumonidae: Anomaloninae) in Syria. *Journal of Insect Biodiversity and Systematics*, 7 (3), 225–229. <https://doi.org/10.52547/jibs.7.3.225>
- Zardouei Heydari, M., Rakhshani, E. & Mokhtari, A. (2019) Occurrence of the genus *Erigorgus* Forster (Hym., Ichneumonidae, Anomaloninae) in Eastern part of Iran with key to species. *Journal of Insect Biodiversity and Systematics*, 5 (1), 69–78.  
<https://doi.org/10.52547/jibs.5.1.69>
- Zardouei Heydari, M., Rakhshani, E., Mokhtari, A. & Schwarz, M. (2020) The genus *Anomalon* Panzer (Hymenoptera: Ichneumonidae: Anomaloninae) of Iran, with description of a new species. *European Journal of Taxonomy*, 662, 1–19.  
<https://doi.org/10.5852/ejt.2020.662>
- Zarepour, A., Masnadi-Yazdinejad, A. & Jussila, R. (2009) Ichneumonidae (Hymenoptera) from Iran, with new records. *Entomologica Fennica*, 20 (1), 3–10.

## گزارش‌های جدید و اطلاعات تکمیلی از زنبورهای زیرخانواده *Anomaloninae* (Hymenoptera: Ichneumonidae) در ایران

زهرا بنانی سروستانی<sup>۱</sup>، علی اصغر طالبی<sup>۱</sup>، عباس محمدی خرم‌آبادی<sup>۲</sup>، علی فیضی<sup>۱</sup>

<sup>۱</sup> دانشکده کشاورزی، گروه حشره شناسی، دانشگاه تربیت مدرس، ۳۳۶-۱۴۱۱۵، تهران، ایران

<sup>۲</sup> گروه گیاهپزشکی، دانشکده کشاورزی و منابع طبیعی داراب، دانشگاه شیراز، فارس، ایران

نویسندهٔ مسئول: علی اصغر طالبی | [talebiamodares.ac.ir](mailto:talebiamodares.ac.ir)

**چکیده:** فون زنبورهای پارازیتوئید زیرخانواده *Anomaloninae* در شمال مرکزی و جنوب ایران بررسی شد. نمونه‌ها با استفاده از تلهٔ مالایز طی سال‌های ۲۰۱۰ تا ۲۰۱۳ جمع‌آوری و بر اساس ویژگی‌های ریخت‌شناسی شناسایی شدند. چهار گونه برای اولین بار از ایران گزارش شد: *Erigorgus annulitarsis* (Thomson, 1892)، *E. varicornis* (Thomson, 1894)، *Trichomma occisor* Habermehl, 1909 و *Therion circumflexum* (Linnaeus, 1758). به‌علاوه ۱۸ گونه به عنوان گزارش جدید استانی ثبت گردید. با احتساب نتایج این پژوهش، آمار گونه‌های زیرخانواده *Anomaloninae* در ایران به ۵۰ گونه افزایش یافت. ویژگی‌های افتراقی و تصاویر مربوط به گزارش‌های جدید و سه گونه‌ی قبلاً ثبت‌شده ارائه شد که به بهبود دانش تاکسونومی این زنبورهای در منطقه کمک می‌کند.

ویراستار علمی  
احسان رخشانی

دریافت: ۰۷ اردیبهشت ۱۴۰۵

ویرایش: ۲۰ خرداد ۱۴۰۵

پذیرش: ۲۲ خرداد ۱۴۰۵

انتشار: ۲۳ خرداد ۱۴۰۵

**واژگان کلیدی:** زنبورهای داروین، انتشار، بررسی فونستیک، پارازیتوئید، گزارش جدید، ریخت‌شناسی