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A study of the Iranian Cremastinae (Hymenoptera: Ichneumonidae)

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ABSTRACT. The subfamily Cremastinae Förster, 1869 (Hymenoptera: Ichneumonidae) was studied in Fars and Hormozgan provinces (southern Iran). The specimens were collected using Malaise traps and sweeping nets. Nine species were identified of which two species including *Temelucha afghana* Šedivý, 1968 and *Temelucha confluens* (Gravenhorst, 1829) are new records for the fauna of Iran. With result of this study, the number of Cremastinae species known from Iran has increased to 24 species in six genera. An identification key to Iranian Cremastinae is provided, as well as a morphological diagnosis for the newly recorded species.

Key words: Cremastinae, *Temelucha*, *Pristomerus*, Iran

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Introduction

The subfamily Cremastinae comprises more than 750 described species worldwide (Yu *et al*. 2012). The members of Cremastinae occur mainly in the arid regions (Gauld 1984; Dasch 1979; Townes 1965;). The Cremastinae are well known as important biological control agents of leaf-rollers, gall-makers, wood-borers and other concealed living insect-larvae (Narolsky 2002). Most species are parasitoids of weakly concealed Lepidoptera, but at least some of them attacking immature stages of Coleoptera in similar habitats (Townes 1965; Quicke 2015). They are koinobiont endoparasitoids, but the final instar larva emerges from the host and completes feeding externally and almost consuming everything except the head capsule of the host (Quicke 2015). The biology of some species of *Cremastus* Gravenhorst 1829 and *Pristomerus* Curtis 1836, which are associated with codling moth, *Cydia pomonella* (Linnaeus, 1758) (Lepidoptera: Tortricidae) were studied by Bradley and Burgess (1934). Hosts of *Pristomerus* are Lepidoptera families such as Tortricidae, Crambidae, Sesiidae and Oecophoridae

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(Quicke 2015). Cremastinae of Iran have recently been investigated by several researchers (Narolsky and Schönitzer 2003; Kolarov and Ghahari 2005; Masnadi-Yazdinejad and Jussila 2009; Kishani Farahani *et al*. 2010; Ghahari *et al*. 2010; Ghahari and Jussila 2010a, b, 2011a, b, c, d; Ghahari and Schwarz 2011; Barahoei *et al*. 2014; Sarafi *et al.* 2015) mainly in the north and northwest of Iran. The objective of this study as a part of our research is the survey of Cremastinae fauna of some southern regions of Iran. The results may be useful for future biological control of insect pests and the ecological studies.

Materials and Methods

Sampling was performed using Malaise traps and sweeping net at 22 locations in Fars and Hormozgan provinces from February 2011 till August 2013. Different ecosystems such as forests, rangelands, desert plants and mangrove, fruit orchards (tropical and non-tropical trees) and agro-ecosystems were selected for sampling. The captured specimens were extracted from the collecting jars irregularly with one or two week intervals, then treated with mixture of ethanol (60%) /Xylene (40%) for two days, followed by Amyl acetate for two days (AXA) and finally placed on the filter paper for drying (van Achterberg 2009). The dried specimens were then card mounted and labeled.

Morphological terminology follows Townes (1969) and Yoder *et al*. (2010). Microsculpture terminology follows Eady (1968). Relevant literatures (Townes 1971; Kasparyan 1981; Horstmann 1990; Kolarov 1997)) were used for identification of the specimens. Illustrations were taken using an Olympus™ SZX9 stereomicroscope equipped with a Sony™ digital camera. A series of 7–10 captured images were merged into a single in-focus image using the image-stacking software Zerene Stacker *version* 1.04. The specimens are deposited in the Collection of Department of Entomology, Tarbiat Modares University (TMUC), Tehran, Iran. In the species list, the following data are included: valid taxa names, synonyms, published records with provincial distribution in Iran and other chorological data. Classification and the distributional data followed Yu *et al*. (2012). Some abbreviation used in redescription new record species are as follows: OOL (Ocular ocellar line) = distance between lateral ocellus and compound eye margin; POL (Posterior ocellar line) = distance between inner margins of the posterior ocelli.

Results

The results of this study and review of the previously recorded taxa revealed the existence of 24 species of Cremastinae belong to six genera in Iran, of them two species including *Temelucha afghana* Šedivý, 1968 and *T. confluens* (Gravenhorst, 1829) are newly recorded for the Iranian fauna.

Key to the genera and species of Iranian Cremastinae

1. Second metasomal tergite with thyridium (Figs. 13, 14); hind femur with a tooth on ventral surface (Fig. 18) (genus *Pristomerus*) ……..…**7**

- Second metasomal tergite without thyridium (Fig. 5); hind femur without a tooth on ventral surface…….**2**

2. Ventral margins of first metasomal tergite tend to touch sternite and thus sternite partly or mostly invisible ……..……...**3**

- Ventral margins of first metasomal tergite parallel and separated from sternite thus sternite visible in its entire length ……..…..… **4**

3. Middle tibia with single spur (genus *Eucremastus*), collar of pronotum unusual and strongly enlarged dorsally……..……..
……..……***Eucremastus collaris*** Narolsky, 1990

- Middle tibia with two spurs (genus *Temelucha*) ……..……..…**11**

4. Occipital carina complete or incomplete and straight in dorsal parts; male paramer without basal lobe …… **5**

- Occipital carina incomplete and indented downwards in dorsal parts; male paramer with basal lobe (genus *Cremastus*……..…… **6**

5. Occipital carina complete (genus *Trathala*); antennal flagellum with a gold ring (10–12th segment), lower margin of clypeus simple, ocelli normal; body reddish brown.....……..
…..***Trathala hierochontica*** (Schmiedeknecht, 1910)

- Occipital carina incomplete (genus *Pharetrophora*); antennal flagellum without gold ring, lower margin of clypeus with distinct lamella, ocelli in both sexes large; body yellow with white spots…….….
..***Pharetrophora iranica*** Narolsky & Schönitzer, 2003

6. Face entirely black, clypeus black, gena 1.5X as long as basal width of mandible …….…....***Cremastus gigas*** Heinrich, 1953

- Face usually with yellow spots, clypeus yellow, gena shorter ….……
……..…***Cremastus pungens*** Gravenhorst, 1829

7. Nervellus broken at least at 0.85 or more of its length or not broken; ovipositor sheath 2.0X as long as hind tibia……
…...***Pristomerus mesopotamicus*** Horstmann, 1990

- Nervellus broken at 0.65–0.8 of its length, ovipositor sheath shorter than 2.0X of hind tibia……..……...**8**

8. At least half of post-petiole and second metasomal tergite not striate (Fig. 13); tooth of hind femur slightly longer than basal width of hind tibia, ovipositor sinuate at apex……..…….
……..…….***Pristomerus luridus*** Kokujev, 1905

- Post-petiole and second metasomal tergite entirely striate (Fig. 14), tooth of hind femur shorter than basal width of hind tibia, ovipositor not sinuate ……..……..……...**9**

9. Mesoscutum and scutellum densely punctate, space between points on the mesoscutum leathery (Fig. 15) …….……
…….. ***Pristomerus vulnerator*** (Panzer, 1799)

- Mesoscutum and scutellum punctate, space between the points on the mesoscutum with a smooth surface (Fig. 16) …….……**10**

10. Body length 4.0–6.0 mm; frons as wide as or slightly wider than face, occipital carina indented in the middle ……...
…… ***Pristomerus horribilis*** Narolsky, 1987

- Body length 7.0–9.0 mm; frons slightly narrower than face, occipital carina not indented the middle ……..
……. ***Pristomerus armatus*** (Lucas, 1849)

11. Head and mesosoma in most parts light colored ……..……... **12**

- Head and mesosoma in most parts dark colored ……..……... **17**

12. All coxae either with red or yellow color.. **13**

- At least hind coxae partly dark colored ……..……. **15**

13. Second discoidal cell 1.5X as long as first brachial cell **……
……*Temelucha schoenobia*** (Thomson, 1890)

- Second discoidal cell shorter than 1.5X length of the first brachial cell ……..……... **14**

14. Ocelli small, OOL longer than lateral ocelli diameter ……
…… ***Temelucha dorsonigra*** (Hedwig, 1957)

- Ocelli large, lateral ocelli diameter 2.0X as long as OOL ……**16**

15. Hind tarsal claws longer than arolium, fifth tarsal segment 4.2X as long as wide …..…..…..…
……...……***Temelucha afghana*** Šedivý, 1968

- Hind tarsal claws as long as arolium, fifth tarsal segment 3.2–3.4X as long as wide ……..…
……. ***Temelucha observator*** Aubert 1966

16. Second recurrent vein interstitial …….***Temelucha tricolorata*** Šedivý, 1968

- Second recurrent vein postfurcal ……..
……***Temelucha decorata*** (Gravenhorst, 1829)

17. Clypeus flat with straight lower margin …… **18**

- Clypeus moderately or strongly convex with curved lower edge ……. **19**

18. Ventral margins of first metasomal tergite not touching each other ……..……
……. ***Temelucha caudata*** (Szépligeti, 1899)

- Ventral margins of first metasomal tergite touching each other ……..……..
…….……. ***Temelucha signata*** (Holmgren, 1860)

19. Clypeus strongly convex and distinctly separated from face ……..…….. **… … …*Temelucha discoidalis*** (Szépligeti, 1899)

- Clypeus moderately convex, weakly separated from face …….……..…… **20**

20. Scutellum entirely or partly yellow…… **21**

- Scutellum black, seldom brown or yellow in lateral parts ……. **24**

21. Propodeum short, convex in lateral view**….** …… ***Temelucha lucida*** (Szépligeti, 1899)

- Propodeum elongate, not convex in lateral view …….……...….. **22**

22- Head linearly restricted behind eyes in dorsal view (Fig. 17); ocelli large in male; ovipositor apically sinuate …….…… ….. ***Temelucha interruptor*** (Gravenhorst, 1829)

- Head roundly restricted behind eyes in dorsal view (Fig. 8), ocelli small in both sexes; ovipositor apically not sinuated ……..…..…**23**

23. Head as wide as or narrower than mesosoma, narrowed behind eyes (Fig. 8), frons not concave (Fig. 13) ……..……. …… ***Temelucha confluens*** (Gravenhorst, 1829)

- Head wider than mesosoma, slightly narrowed behind eyes, frons concave ……..… ***Temelucha persicator*** Horstmann and Yu, 1999

24. Mesoscutum 1.1X as long as wide, ovipositor curved downwards at apex ….…….. ……. ***Temelucha thoracica*** **Kolarov 1989**

- Mesoscutum longer than 1.1X of its width, ovipositor straight at apex ……..…….. ……. ***Temelucha arenosa*** (Szépligeti, 1899)

List of species of Cremastinae from Iran

Cremastus gigas Heinrich, 1953

Distribution in Iran: Fars province (Masnadi-Yazdinejad and Jussila 2009).

General distribution: Western Palaearctic (Austria, Bulgaria, Germany, Iran, Italy, Poland, Turkey).

Cremastus pungens Gravenhorst, 1829

Distribution in Iran: West-Azerbaijan (Ghahari and Jussila 2011d), Mazandaran (Ghahari and Jussila 2011a; Ghahari and Schwarz 2011) and Guilan provinces (Ghahari and Jussila 2012).

General distribution: Western Palaearctic (Austria, Bulgaria, Czech Republic, Denmark, Finland, France, Germany, Hungary, Iran, Italy, Latvia, Lithuania, Mongolia, Montenegro, Netherlands, Poland, Romania, Russia, Serbia, Spain, Sweden, Turkey, Ukraine, United Kingdom).

Eucremastus collaris Narolsky, 1990

Distribution in Iran: Ardabil (Ghahari and Jussila 2011 d) and Mazandaran provinces (Ghahari and Jussila 2011a; Ghahari and Schwarz 2011).

General distribution: Western Palaearctic (Armenia, Azerbaijan, Georgia, Greece, Iran, Turkey).

Pharetrophora iranica Narolsky & Schönitzer, 2003

Distribution in Iran: Yazd province (Narolsky and Schönitzer 2003).

General distribution: Western Palaearctic (Iran).

Pristomerus armatus (Lucas, 1849)

Material examined: Fars province, Dejkord (30°43′59″N, 51°57′03″E, 2168 m), Malaise trap, 1♀, 10.vi.2013, leg.: A. Amiri.

Distribution in Iran: Golestan (Ghahari and Jussila 2011d) and Mazandaran provinces (Ghahari and Jussila 2010a, 2011a).

General distribution: Western Palaearctic (Algeria, Armenia, Belarus, Belgium, Bulgaria, Croatia, Czech Republic, France, Georgia, Germany, Greece, Hungary, Iran, Italy, Kazakhstan, Kyrgyzstan, Lithuania, Moldova, Montenegro, Morocco, Netherlands, Poland, Romania, Russia, Serbia, Slovakia, Sweden, Switzerland, Turkey, Turkmenistan, Ukraine, Uzbekistan).

***Pristomerus horribilis* Narolsky, 1987**

Distribution in Iran: Golestan (Ghahari and Jussila 2010b), West-Azerbaijan (Ghahari and Jussila 2011b) and Mazandaran provinces (Ghahari and Schwarz 2011).

General distribution: Western Palaearctic (Bulgaria, Czech Republic, Germany, Iran, Poland, Slovakia, Switzerland, Turkey, Ukraine).

***Pristomerus luridus* Kokujev, 1905**

Distribution in Iran: Khorasan-e-Razavi province (Masnadi-Yazdinejad and Jussila 2009).

General distribution: Western Palaearctic (Algeria, Croatia, France, Georgia, Germany, Greece, Hungary, Iran, Italy, Kazakhstan, Kyrgyzstan, Spain, Tajikistan, Tunisia, Turkey, Turkmenistan, Ukraine, Uzbekistan).

***Pristomerus mesopotamicus* Horstmann, 1990**

Distribution in Iran: Khuzestan (Ghahari and Jussila 2011d) and Mazandaran provinces (Ghahari and Jussila 2011a; Ghahari and Schwarz 2011).

General distribution: Western Palaearctic (Iran, Iraq, Turkey).

***Pristomerus vulnerator* (Panzer, 1799)**

Material examined: Fars province, Dejekord (30°43′59″N, 51°57′03″E, 2168 m), 19.vii.2012, Malaise trap, 1♀, leg.: A. Amiri.

Distribution in Iran: West-Azerbaijan province (Masnadi-Yazdinejad and Jussila 2009) .

General distribution: Western Palaearctic (Armenia, Austria, Azerbaijan, Azores, Belarus, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Egypt, Finland, France, Georgia, Germany, Greece, Hungary, Iran, Ireland, Israel, Italy, Japan, Kazakhstan, Korea, Latvia, Lebanon, Lithuania, Moldova, Mongolia, Netherlands, Poland, Romania, Russia, Serbia, Montenegro, Spain, Sweden, Switzerland, Tajikistan, Turkey, Turkmenistan, Ukraine, United Kingdom, Uzbekistan), Nearctic (Canada and USA, introduced), Oriental (China, India).

***Temelucha afghana* Šedivý, 1968* (Figs 1–6)**

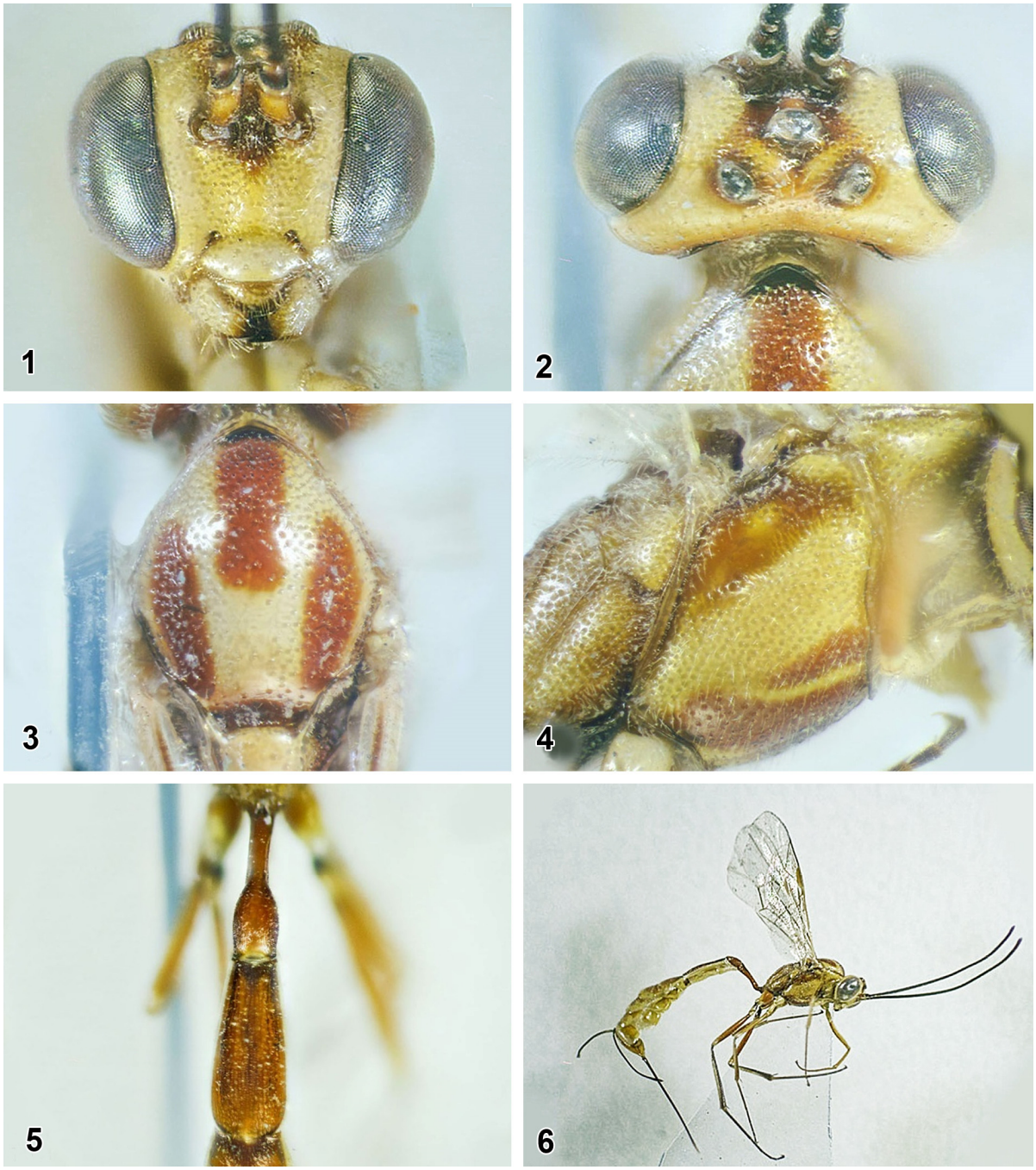
Material examined: Fars province, Seddeh (30°44′08″N, 52°09′09″E, 2301 m), 22.v.2013, Sweeping net, 2♀♀, 1♂, leg.: A. Amiri.

Diagnosis: Female - Body length 13–15 mm, length of fore wing 5.0 mm, antenna 35 segmented, malar space almost short and 0.57 X as long as basal width of mandible; clypeus transverse, 2.15 X as wide as its length (Fig. 1), face transverse, its length 0.4 X as long as width, head 5.0 X as wide as face, frons concave with two tubercles in lateral margin (Figs. 1, 2), OOL 1.1 X and POL 1.9X as long as lateral ocelli diameter (Fig. 2), speculum smooth (Fig. 4), mesopleuron and scutellum punctate (Fig 3), length of hind femur 8.0 X as long as its width, length of hind tibia 1.5 X as long as hind basitarsus, first metasomal tergite 1.1 X as long as second tergite, second tergite with longitudinal striation (Fig. 5), its length 2.3 X as long as its posterior width, ovipositor sheath 2.2 X as long as hind tibia.

Coloration: Antenna brownish black, scape and pedicel reddish yellow, head yellow, mandible yellow with black tooth, mesosoma with red stripes (Figs. 3, 4), coxae and trochanters in fore and middle legs yellow, femora and tibiae reddish yellow, tarsi brown, hind coxa and femur red, tibia in outside yellow and inside brown, first to third metasomal tergites red, the rest yellowish (Fig. 6).

Distribution in Iran: New for Iran fauna.

General distribution: Western Palaearctic (Afghanistan, Iran, Turkey).



Figures 1–6. *Temelucha afghana* Šedivý, 1968, female: **1.** Head frontal view, **2.** Head dorsal view, **3.** Mesoscutum, **4.** Mesopleuron, **5.** First and second metasomal tergites, **6.** Habitus lateral view.

***Temelucha arenosa* Szépligeti, 1899**

Distribution in Iran: Tehran (Ghahari and Jussila 2010 a) and East-Azerbaijan provinces (Ghahari and Jussila 2011c).

General distribution: Western Palaearctic (Czech Republic, France, Germany, Hungary, Iran, Ireland, Lithuania, Macedonia, Netherlands, Poland, Romania, Serbia, Spain, Sweden, Turkey, United Kingdom).

***Temelucha caudata* (Szépligeti, 1899)**

Material examined: Hormozgan province, Ghalee Ghazi (27°26′53″N,56°32′53″E, 48 m), 18.iii.2013, 1♀, Faryab (27°28′58″N, 57°04′ 24″E, 313 m), 18.vii.2013, Malaise trap, 1♂, 1♀, leg.: A. Ameri.

Distribution in Iran: Kordestan (Ghahari and Jussila, 2011d), Mazandaran (Ghahari and Jussila 2011a; Ghahari and Schwarz 2011) and Guilan provinces (Ghahari and Jussila 2012).

General distribution: Western Palaearctic (Austria, Bulgaria, Croatia, Czech Republic, France, Hungary, Iran, Italy, Lithuania, Russia, Spain, Turkey).

***Temelucha confluens* (Gravenhorst 1829)* (Figs 7–12)**

Material examined: Fars province, Noor Abad (30°07′ 03″N, 51°33′ 48″E, 1695 m), 08.iv.2014, Sweeping net, 1♀; leg.: A. Amiri.

Diagnosis: Female - Body length 7.2 mm, length of fore wing 4.0 mm, antenna 33 segmented, malar space almost long, its length as long as basal width of mandible; clypeus transverse, 1.8 X as wide as its length (Fig. 7), face transverse, 0.4 X as long as its width, head 1.7 X as wide as face (Fig. 7), OOL 1.2 X and POL 2.0 X as long as lateral ocelli diameter (Fig. 8), mesopleuron transverse and punctate (Fig. 9), mesoscutum punctate (Fig. 10), areola of propodeum and petiolar area transversely wrinkled (Fig. 11), length of hind femur 5.1 X as long as its width, length of hind tibia 1.9 X as long as hind basitarsus, first metasomal tergite 1.1 X as long as second tergite, second tergite 2.5 X as long as its posterior width, ovipositor 1.9 X as long as hind tibia.

Coloration: Antenna black, head and mesosoma black with yellow spots, mandible yellowish with brownish teeth, clypeus with black base and yellow at apex, face black, frontal orbits yellow and connect to facial orbits, temple at upper half yellow and at lower half black, mesoscutum black with two longitudinal yellow stripes (Fig. 10), scutellum yellowish with black base semicircle spot, front and middle coxae with black base and yellowish apex, trochanter, femur, tibia and tarsus reddish yellow, hind coxa and trochanter black, hind femur brown, middle of hind tibia reddish yellow, brown at base and apex, tarsi brown, first and second tergites black, 3rd to 7th tergites dark brown with narrow yellow stripes on posterior margin (Fig. 12).

Distribution in Iran: New for Iran fauna.

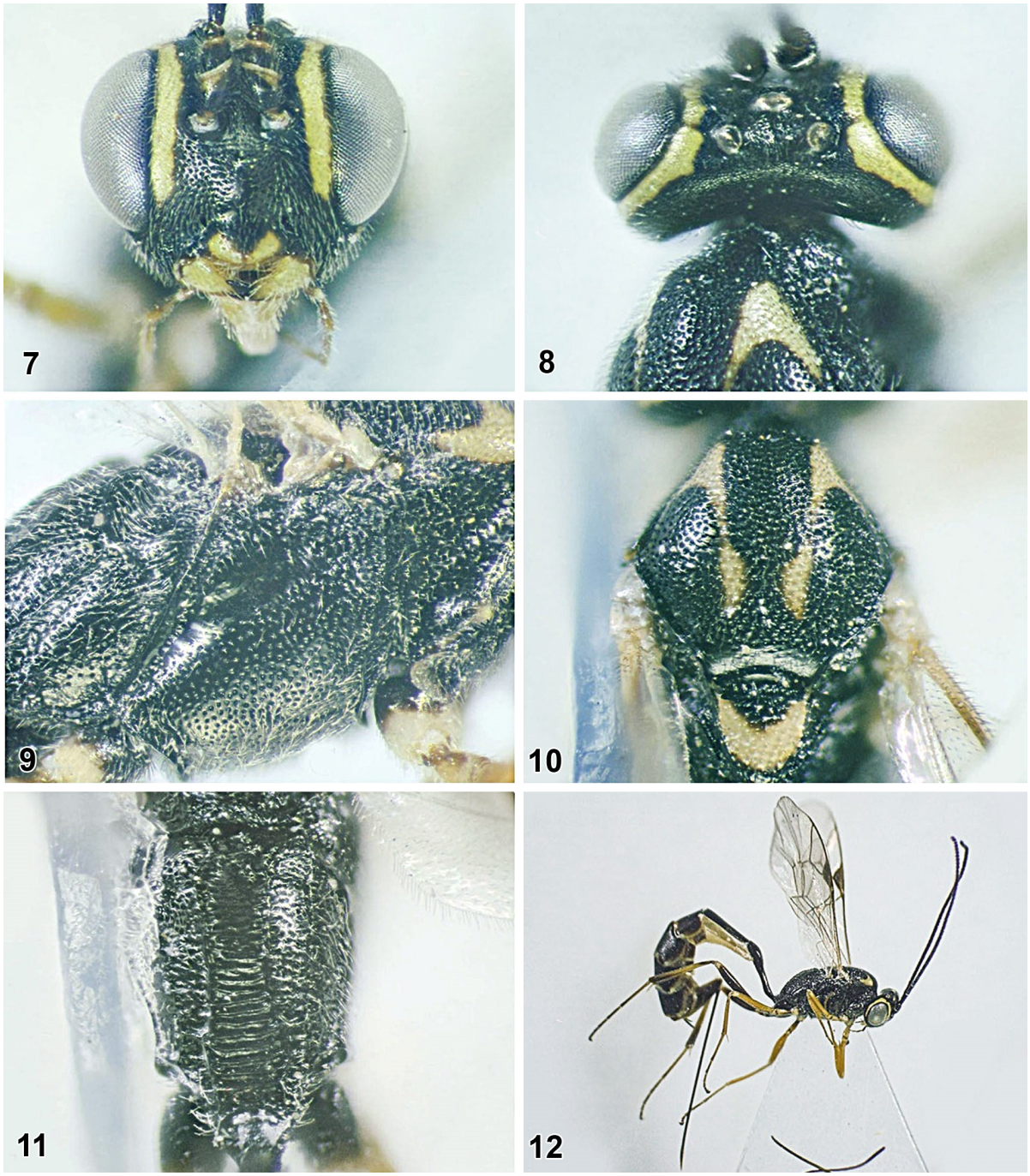
General distribution: Western Palaearctic (Austria, Belgium, Bulgaria, Croatia, Czech Republic, Finland, France, Germany, Hungary, Iran, Israel, Italy, Lithuania, Moldova, Montenegro, Netherlands, Poland, Romania, Russia, Serbia, Spain, Sweden, Turkey).

***Temelucha decorata* (Gravenhorst, 1829)**

Material examined: Hormozgan province, Tahghighat (27°08′39″N, 57°04′31″E, 28 m), 21.iii.2013, Malaise trap, 2♀♀, Ramkan (26°52′25″N, 56°01′07″E, 34 m), 03.iii.2013, Malaise trap 1♀, 07.vii.2012, 1♂, leg.: A. Ameri.

Distribution in Iran: Golestan (Ghahari and Jussila 2010 b), Qom and Markazi (Kishani Farahani *et al*. 2010), Mazandaran (Ghahari and Jussila 2011a; Ghahari and Schwarz 2011) and Khorasan-e-Razavi provinces (Ghahari and Jussila 2011d).

General distribution: Nearctic (USA, introduced), Western Palaearctic (Afghanistan, Algeria, Austria, Azerbaijan, Bulgaria, Canary Islands, Croatia, Cyprus, Czech Republic, Egypt, Finland, France, Germany, Greece, Hungary, Iran, Israel, Italy, Latvia, Macedonia, Madeira Islands, Moldova, Montenegro Morocco, Romania, Russia, Serbia, Spain, Sweden, Turkey, Ukraine, United Kingdom, Uzbekistan).



Figures 7–12. *Temelucha confluens* (Gravenhorst 1829), female: **7.** Head frontal view, **8.** Head dorsal view, **9.** Mesoscutum, **10.** Mesopleuron, **11.** Propodeum, **12.** Habitus lateral view.

***Temelucha discoidalis* (Szépligeti, 1899)**

Material examined: Fars province, Dejekord (30°43′58″N,51°57′03″E, 2168 m), 21.vi.2012, Malaise trap, 1♂ 1♀; 31.viii.2012, 1♀, leg.: A. Amiri.

Distribution in Iran: Mazandaran (Ghahari and Jussila 2010a, 2011a), West-Azerbaijan (Ghahari and Jussila 2011d) and Guilan provinces (Ghahari and Jussila 2012).

General distribution: Western Palaearctic (Bulgaria, Czech Republic, France, Germany, Hungary, Iran, Poland, Romania, Russia, Serbia, Spain, Turkey).

Temelucha dorsonigra **(Hedwig, 1957)**

Distribution in Iran: Not exactly defined (Kolarov and Ghahari 2005).

General distribution: Western Palaearctic (Afghanistan, Iran, Kazakhstan, Mongolia, Spain).

Temelucha interruptor **(Gravenhorst, 1829)**

Material examined: Fars province, Seddeh (30°44′08″N, 52°08′37″E, 2317 m), 22.iv.2013, Sweeping net, 1♀, 2♂, leg.: A. Amiri.

Distribution in Iran: Mazandaran (Ghahari and Jussila 2011a; Ghahari and Schwarz 2011) and West-Azerbaijan provinces (Ghahari and Jussila 2011d).
General distribution: Western Palaearctic (Austria, Belgium, Bosnia Herzegovina, Bulgaria, Croatia, Czech Republic, Denmark, England, Finland, France, Germany, Iran, Italy, Latvia, Lithuania, Luxembourg, Macedonia, Moldova, Netherlands, Norway, Poland, Romania, Russia, Serbia, Montenegro, Sweden, Turkey, Ukraine).

Temelucha lucida **(Szépligeti, 1899)**

Distribution in Iran: Fars (Ghahari and Jussila 2010a) and West-Azerbaijan provinces (Ghahari and Jussila2011b, c).

General distribution: Western Palaearctic (Bulgaria, Czech Republic, Greece, Hungary, Iran, Italy, Moldova, Romania, Russia, Turkey).

Temelucha observator **Aubert, 1966**

Distribution in Iran: Mazandaran province (Ghahari and Jussila 2010a).

General distribution: Western Palaearctic (Afghanistan, Egypt, Iran, Israel, Italy, Libya, Morocco, Romania, Tunisia, Turkey).

Temelucha persicator **Horstmann and Yu, 1999**

Distribution in Iran: Guilan province (Masnadi-Yazdinejad and Jussila 2009).

General distribution: West Palaearctic (Iran, Saudi Arabia).

Temelucha schoenobia **(Thomson, 1890)**

Material examined: Fars Province, Sedeh (30°41′08″N, 52°08′12″E, 2317 m), 22.vi.2012, Sweeping net, 2♀♀ 2♂♂, leg.: A. Amiri; Hormozgan province, Chelo (27°10′30″N, 57°01′09″E, 16 m), 08.xi.2012, Malaise trap, 2♀♀; 05.iv.2012, 2♀♀; 07.xii.2012, 1♂; 04.v.2012, 5♂♂; Tahghighat (27°08′39″N, 57°04′31″E, 28 m), 01.v.2012, Malaise trap, 1♀; 01.vi.2012, 2♀♀; Geno (27°24′16″N, 56°08′51″E, 1274 m), 20.iii.2012, Malaise trap 4♀♀ 4♂♂; 03.iv.2012, 1♂; Ghalee-Ghazi (27°26′53″N, 56°32′53″E, 48 m), 03.iv.2012, Malaise trap, 2♂♂ 4♀♀; 16.iv.2013, 2♂; Zakin (27°51′51″N, 56°18′34″E, 1630 m), 24.v.2011, Malaise trap, 1♂ 3♀♀, leg.: A. Ameri.

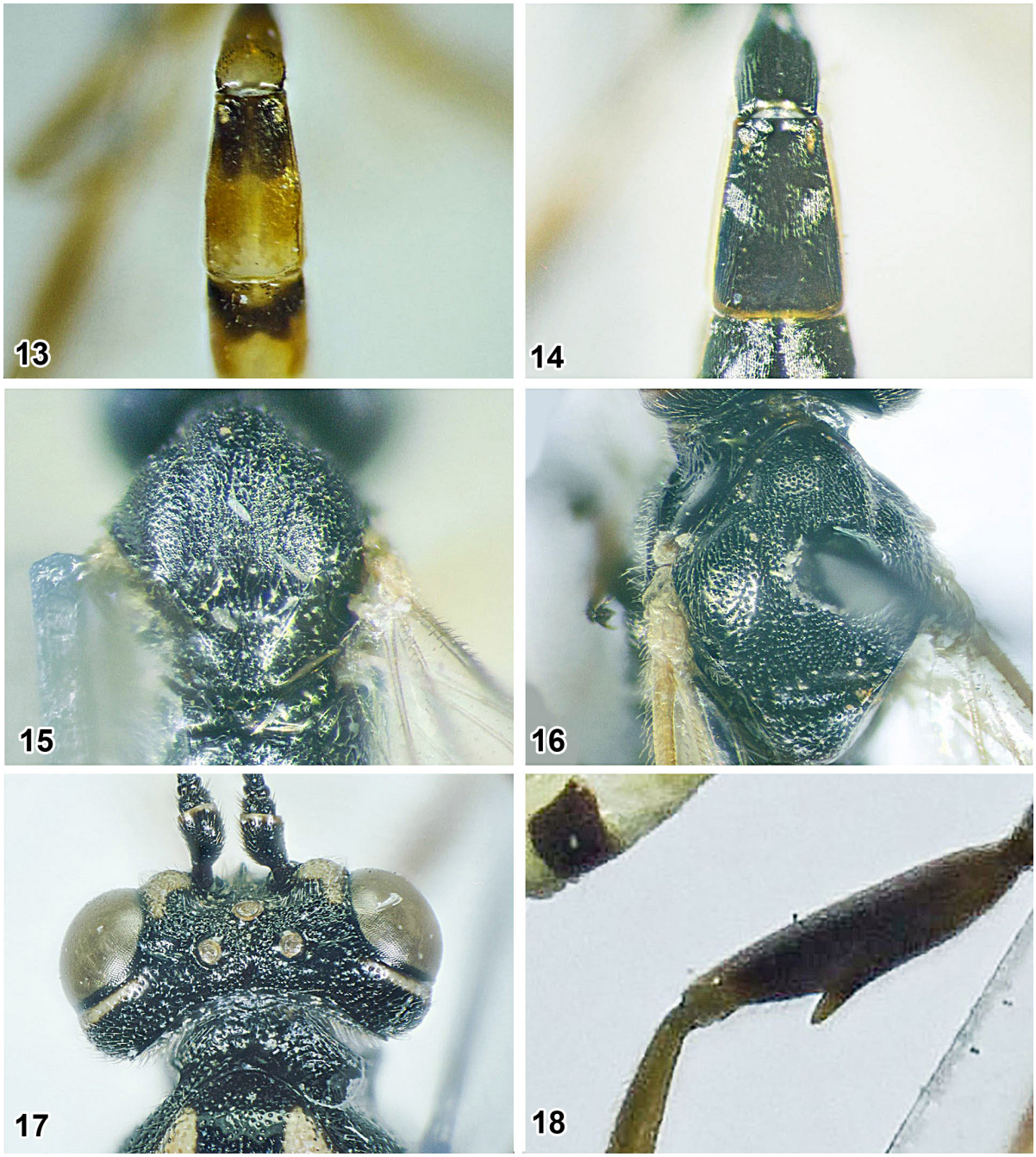
Distribution in Iran: Golestan province (Masnadi-Yazdinejad and Jussila 2009).

General distribution: Western Palaearctic (Bulgaria, Czech Republic, Finland, Hungary, Iran, Poland, Romania, Russia, Sweden, Turkey, Turkmenistan).

Temelucha signata **(Holmgren, 1860)**

Distribution in Iran: Mazandaran (Ghahari and Jussila 2011a; Ghahari and Schwarz 2011) and Kordestan provinces (Ghahari and Jussila 2011d).

General distribution: Western Palaearctic (Austria, Bulgaria, Czech Republic, Denmark, Finland, Germany, Hungary, Iran, Ireland, Lithuania, Moldova, Mongolia, Poland, Romania, Spain, Sweden, Turkey, Ukraine, United Kingdom).



Figures 13–18. *Pristomerus* and *Temelucha* species: **13.** First and second metasomal tergites of *Pristomerus luridus*, dorsal view, **14.** First and second metasomal tergites of *Pristomerus vulnerator*, **15.** Mesoscutum of *Pristomerus vulnerator*, **16.** Mesoscutum of *Pristomerus armatus*, **17.** Vertex of *Temelucha interruptor*, **18.** Femur of *Pristomerus vulnerator.*

***Temelucha tricolorata* Šedivý, 1968**

Distribution in Iran: Mazandaran (Ghahari and Jussila 2010a, 2011a), Khorasan-e-Razavi (Ghahari and Jussila 2011d, Barahoei *et al*. 2014) and Guilan provinces (Ghahari and Jussila 2012).

General distribution: Western Palaearctic (Afghanistan, Canary Islands, Iran, Turkey).

***Trathala hierochontica* (Schmiedeknecht, 1910)**

Distribution in Iran: Mazandaran province (Masnadi-Yazdinejad and Jussila 2009).

General distribution: WesternPalaearctic (Bulgaria, Egypt, France, Iran, Israel, Morocco, Romania, Russia, Turkey).

Discussion

Pristomerus and *Temelucha* are two large genera belong to subfamily Cremastinae with 100 and 235 described species, respectively (Yu *et al*. 2012). The genus *Temelucha* has more than 74 species in Palaearctic and almost is the largest genus of Cremastinae in Palaearctic region (Yu *et al*. 2012). So far, 14 species belong to this genus have been reported from Iran, among them *T. schoenobia* is the most common species in the south and north of the country (Masnadi-Yazdinejad and Jussila 2009, current study).

In comparison, *Pristomerus* is a smaller genus with five species known from Iran. *Temelucha afghana* is distributed in in rangeland and Zagros foothill areas. This species was formerly known from Afghanistan and Turkey, two neighboring countries of Iran (Šedivý 1968; Kolarov 1997). *Temelucha confluens* as a new record from Iran was collected from Noor-Abad in March 2013. This region is almost warm and arid in north west of Fars province, this species is a parasitoid of *Spodoptera exigua* (Hübner) (Yu *et al*. 2012). Our results showed that some species such as *T. schoenobia* seems to have high ability to establish in different altitudinal zones (from 16 to more than 2300 m).

Our samples were taken by Malaise traps and sweeping nets so we have no information about their host associations. Among the collected species, biology of some species such as *P. vulnerator* has been investigated by a number of researchers (Okada and Oike 1940; Gauld 1984). This species attacks the codling moth *Cydia pomonella* an important and major pest in apple orchards. This species prefer sunny climate and its hosts usually attacked in early instars and probably before they enters to the depth of fruit tissue (Okada and Oike 1940).

Iranian fauna of Cremastinae is poorly investigated and the number of species recorded is still low in comparison to the known Cremastinae species in the Palaearctic region (200 species) and even the neighboring countries (Turkey with 50 recorded species) (Yu *et al*. 2012). With regard to diverse climatic conditions and many unexplored areas in Iran we expect that the Cremastinae fauna of Iran especially of the two large genera *Temelucha* and *Pristomerus* will be substantially increased by the further investigations.

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بررســـی زیرخـــانواده Cremastinae Förster, 1869 (Hymenoptera: Ichneumonidae) در ایران

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چکیده: در این تحقیق زیرخانواده Cremastinae Förster, 1869 (Hymenoptera: Ichneumonidae) در استان های فارس و هرمزگـان (جنـوب ایـران) مـورد بررسـی قـرار گرفت. نمونه ها با استفاده از تله مالیز و تور جمع آوری و ۹ گونـه شناسـایی شـد کـه از ایـن تعـــداد ۲ گونـــه *Temelucha afghana* Šedivý, 1968 و *Temelucha confluens* (Gravenhorst, 1829) برای فون ایران جدید هستند. با احتسـاب نتـایج ایـن مطالعه، تعداد گونه‌های شناخته شده این زیرخانواده برای ایران به ۲۴ گونه متعلق به ۶ جنس افزایش یافت. کلید شناسایی گونه‌های ایران و ویژگی‌های مرفولوژیک افتراقـی گونـه‌هایی کـه برای اولین بار گزارش می‌شوند، تهیه شده است.

واژگان کلیدی: Cremastinae، *Temelucha*، *Pristomerus*، ایران