



The genus *Colotrechnus* Thomson, 1878 (Hymenoptera: Pteromalidae) in the North- and South-Eastern provinces of Iran

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ABSTRACT. A survey was carried out on the genus *Colotrechnus* Thomson, 1878 (Hym., Pteromalidae) in North Eastern (North Khorasan) and South Eastern (Kerman) provinces of Iran. Two species including *Colotrechnus subcoeruleus* Thomson, 1878 and *Colotrechnus viridis* (Masi, 1921) were found, of which the first species is newly recorded from Iran. The new findings represent distribution of this genus along a wide area in Eastern provinces of Iran. An illustrated key to known Iranian species, as well as a brief diagnosis for each species are provided. A distribution map throughout the Palearctic region is also generated and discussed.

Key words: Colotrechninae, parasitoid, fruit fly, new record, Identification key, North Khorasan, Kerman

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Introduction

The genus *Colotrechnus* belonging to the subfamily Colotrechninae (Pteromalidae) described by Thomson (1878) with the type species *Colotrechnus subcoeruleus* Thomson, 1878. Masi (1921) described *Zanonia* with type species, *Z. viridis* Masi, 1921. Later, genus *Zanonia* was considered as junior synonym of *Colotrechnus* by Delucchi (1956). Taxonomy of the genus *Colotrechnus* has received a poor attention until recently. Two West Palearctic species were keyed by Graham (1969). After discovery of

additional species in China (Oriental part), Li et al. (2014) provided the first identification key for the world *Colotrechnus* species. In the most recent contribution, Doğanlar (2018) described eight new species from Turkey and provides an identification key to all known species. Currently, 14 species of *Colotrechnus* are known from various biogeographical ecozones including Palearctic (10), Oriental (3), Australasian (1) and Nearctic (1) (Noyes, 2019).

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The genus *Colotrechnus* is known by only a single species *Colotrechnus viridis* in Iran, as a parasitoid of safflower fruit fly pests (Lotfalizadeh & Gharali, 2008, 2014). Here, we present additional records of the genus *Colotrechnus* from Eastern parts of Iran including a new species record.

Material and methods

Sampling was done in various regions of North Eastern (North Khorasan) and South Eastern (Kerman) provinces of Iran using sweeping net and Malaise-traps. The collected materials were preserved in Ethanol 75%, and inspected to find the *Colotrechnus* specimens in laboratory. Specimens were treated according to AXA protocol (van Achterberg, 2009) and mounted on triangular cards. The external morphology of specimens was studied under a Nikon™ SMZ645 stereomicroscope and imaged using Canon™ EOS 700D (Canon Inc., Japan) camera mounted with an adapter on Hund™ Stereomicroscope (Wetzlar Inc., Germany). The species were identified according to the key in Graham (1969). Terminology of morphological characters generally follows that of Bouček (1988) and Graham (1969). A map of distribution was generated in Simple-Mapp (Shorthouse, 2010). The studied specimens are deposited in the collection of Department of Plant Protection, University of Zabol, Iran (DPPZ).

Results

Family Pteromalidae Dalman, 1820

Subfamily Colotrechninae Thomson, 1876

Genus *Colotrechnus* Thomson, 1878

Colotrechnus Thomson, 1878:46. Type species, *Colotrechnus subcoeruleus* Thomson, by monotypy; *Zanonia* Masi, 1921:184. Type species: *Zanonia viridis* Masi, by monotypy.

Diagnostic characters (Female). Antennal insertion slightly below center of face, distinctly above lower ocular line (Figs 1A,

2A), with two anelli and six funicular segments. Pronotum dorsally rounded, notauli incomplete, scutellum dorsally with conspicuous sub-lateral grooves, propodeum almost smooth and very short and without plica (Figs 1D, 2D). Stigmal vein in fore wing unusually short and almost sessile (Figs 1E, 2E). Gaster sessile and narrowly lanceolate (Figs 1F, 2F).

Colotrechnus viridis (Masi, 1921) (Figs 1, 3A)

Zanonia viridis Masi, 1921: 187: Holotype ♀, Libya.

Colotrechnus viridis (Masi, 1921) Delucchi 1956: 233.

Material examined. Iran, North Khorasan province: Maneh and Semelghan County, Qaleh-Khan village (37°30'32"N, 56°46'50"E, 840 m), swept on weeds, 03.07.2018, 1♀, Leg.: Z. Rahmani; Kerman province: Jiroft (28°40'31.17"N, 57°44'16.69"E, 686 m), swept on *Cyperus globosus*, 09.04.2014, 2♀, swept on weeds, 19.05.2014, 1♀, Leg.: N. Amirinasab.

Diagnosis. Female. Body length 2 mm. Antennal insertion below center of face (Fig. 1A). Longitudinal diameter of eye 2.9 times longer than malar space (frontal view) (Fig. 1A). Width of head in dorsal view 3.78 times its median length (Fig. 1B). Longitudinal diameter of eye 1.89 times longer than its transverse diameter (lateral view) (Fig. 1C). Mesoscutum coarsely reticulate with sparse setae, notauli shallow and incomplete, scutellum shallowly reticulate, frenal area absent; Propodeum very short, median part smooth and shiny, lateral parts weakly reticulate, plica absent, median carina incomplete (Fig. 1D). Fore wing marginal vein 2.7× postmarginal vein and 3.8× stigmal vein (Fig. 1E). Gaster sessile, lanceolate, first, second and third gastral tergites incised medially (Fig. 1F). Body metallic blue (Fig. 3A). Antenna dark brown, legs dark blue (except yellowish

tarsi). Wings hyaline, stigma, veins and setae pale yellow.

Distribution. Azerbaijan, Canary Islands, Croatia, Czech Republic, Hungary, Kazakhstan, Libya, Lithuania, Moldova,

Romania, Russia, Slovakia, Spain, Turkey, Turkmenistan, Uzbekistan (Noyes, 2019); China (Xinjiang), Cyprus (Li et al., 2014); Georgia (Dzhanokmen, 2017); Iran (Lotfalizadeh & Gharali, 2008) (Fig. 4).

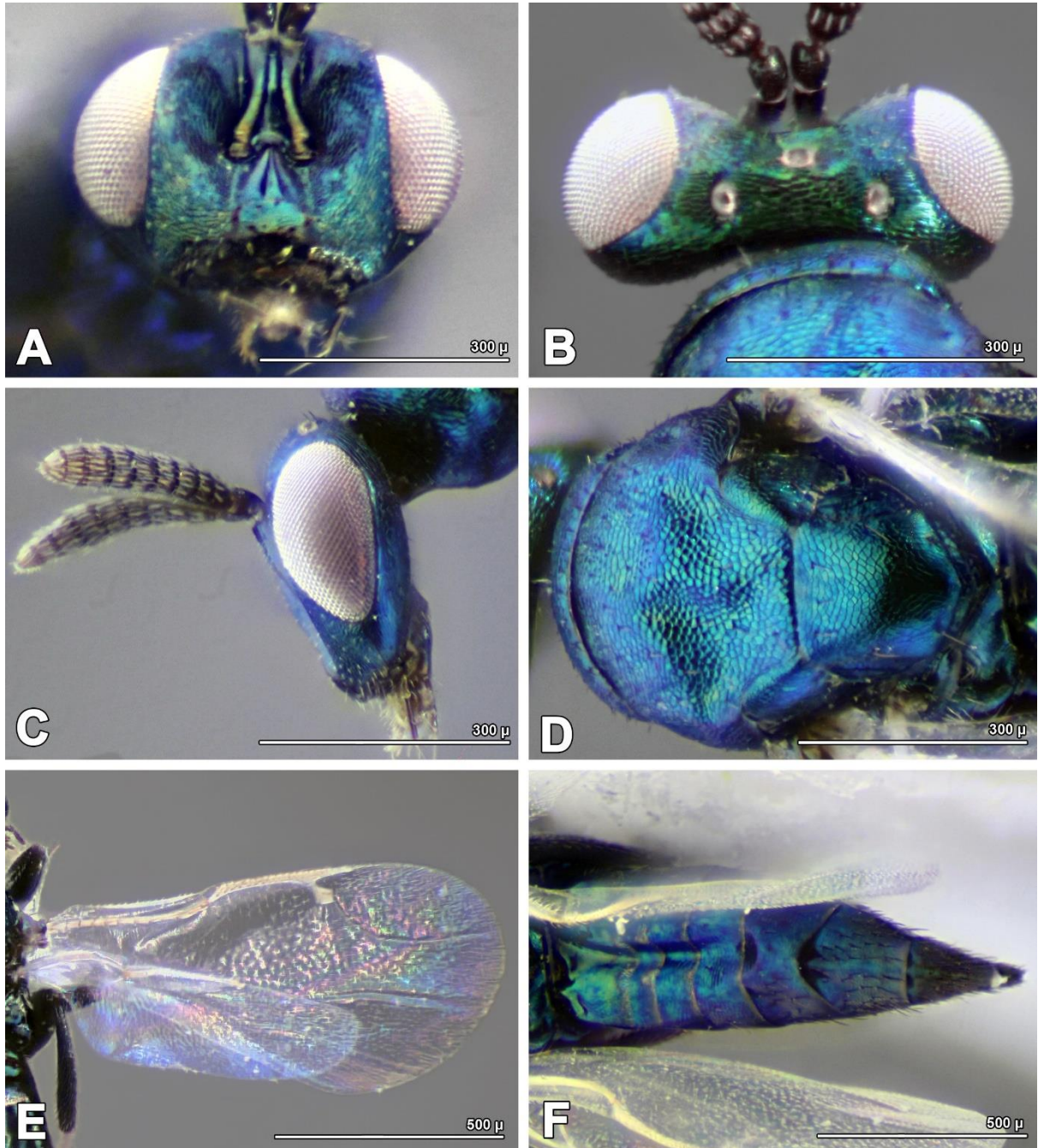


Figure 1. *Colotrechnus viridis* (Masi, 1921). **A.** Head, frontal view; **B.** Head, dorsal view; **C.** Head, lateral view; **D.** Mesosoma, dorsal view; **E.** Fore wings; **F.** Metasoma, dorsal view.

***Colotrechnus subcoeruleus* Thomson, 1878**
(Figs 2, 3B)

Colotrechnus subcoeruleus Thomson, 1878:
46: Syntypes ♀ ♂, Sweden.

Material examined. Iran, Kerman province, Malaise trap, Golbaf (29°52'54.53"N, 57°43'40.71"E, 1743 m), 29.05.2018, 1♀; Baft (29°22'35.96"N, 56°40'18.22"E, 2736 m), 1♀, 07.09.2018, Leg.: Sh. Mohebban.

Diagnosis. Female. Body length 3.26 mm. Antennal insertion below center of face (Fig. 2A). Longitudinal diameter of eye 2.8 times longer than malar space (frontal view) (Fig. 2A). Width of head in dorsal view 3.6 times its median length (Fig. 2B). Longitudinal diameter of eye 1.72 times longer than its transverse diameter (lateral view) (Fig. 2C). Mesoscutum with deep reticulation with dense setae, notauli shallow and incomplete, scutellum shallowly reticulate, frenal area absent; Propodeum very short, median part smooth and shiny, lateral parts weakly reticulate, plica absent, median carina incomplete (Fig. 2D). Fore wing marginal vein 3× postmarginal vein and 4.4× stigmal vein (Fig. 2E). Gaster sessile, lanceolate, first, second and third gasteral tergites incised medially (Fig. 2F). Body dark metallic blue (Fig. 3B). Antenna except basal and apical segments (scape, pedicel, anelli, first and second segments of funicular and last segments of club, brownish yellow) black. Legs with coxa and femur concolorous with body, tibia dark brown, tarsi yellowish. Fore wing with infusate region below marginal vein, stigma, veins and setae brown.

Distribution. Austria, Bosnia and Herzegovina, Croatia, Czech Republic, France, Germany, Hungary, India, Italy, Kazakhstan, Macedonia, Moldova, Montenegro, Romania, Serbia, Slovakia, Spain, Sweden, United Kingdom (Noyes, 2019); Iran (**New record**); Russia (Tselikh & Kostjukov, 2017); Turkey (Doğanlar, 2018) (Fig. 4).

Key to the Iranian species of the genus *Colotrechnus* Thomson, 1878 (Female)

1. Antenna with all funicular segments longer than width (Fig. 2C); fore wing with an infusate region below marginal vein, stigma, veins and setae brown (Fig. 2E); body dark metallic blue (Fig. 3B).....
.....*Colotrechnus subcoeruleus* Thomson
- . Antenna with all funicular segments shorter than width (Fig. 1C); fore wing without infusate region below marginal vein, stigma, veins and setae pale yellow (Fig. 1E); body bright metallic blue (Fig. 3A).....
..... *Colotrechnus viridis* (Masi)

Discussion

Colotrechnus subcoeruleus Thomson is recorded for the first time from Iran (Kerman province). This is the second species of the subfamily Colotrechninae, recorded in Iran. The previously recorded species, *C. viridis* was already collected from three Western provinces (Ilam, East-Azarbaijan and Charmahal-o Bakhtiari provinces) (Lotfalizadeh & Gharali, 2008, 2014) and here it was found in North- and South Eastern parts (North Khorasan and Kerman provinces) of the country. So far, 139 species of Pteromalidae have been reported from Iran (Gibson, 2015; Abolhassanzadeh et al., 2017; Moravvej et al., 2018; Lotfalizadeh et al., 2019a, 2019b; Shojaey et al., 2019). Based on the result of this study number of species of Pteromalidae in Iran increasing to 140 species.

Ignoring the eight new *Colotrechnus* species that has recently been described from Turkey (Doğanlar, 2018), two species *C. subcoeruleus* and *C. viridis* are known as common species, widely distributed throughout the Palaearctic region. Some species of safflower attacking fruit flies (Dip.: Tephritidae) including, *Acanthiophilus helianthi* Rossi, *Chaetorella carthami* Stackelberg, *Terellia luteola* Wiedemann and *Urophora mauritanica* Macquart are recorded as hosts of *Colotrechnus viridis* in Iran (Lotfalizadeh & Gharali, 2008, 2014). On the other hand, no clear host evidences

are documented for *C. subcoeruleus* (Andriescu & Mitroiu, 2001). The oriental species, *Colotrechnus agromyzae* Subba Rao, 1981 was reared from the agromyzid leafminers (Diptera: Agromyzidae) (Subba Rao, 1981). The association of *Colotrechnus* with the agromyzid leafminers seems not to be so common, at least in Iran, since it is

not documented in the course of several studies on the parasitoid spectrum of these insects (Talebi et al., 2005; Asadi et al., 2006; Lotfalizadeh et al., 2015). Further studies by rearing the tephritids and agromyzid larvae at same area are necessary to find the host associations for the recorded *Colotrechnus* in Iran.

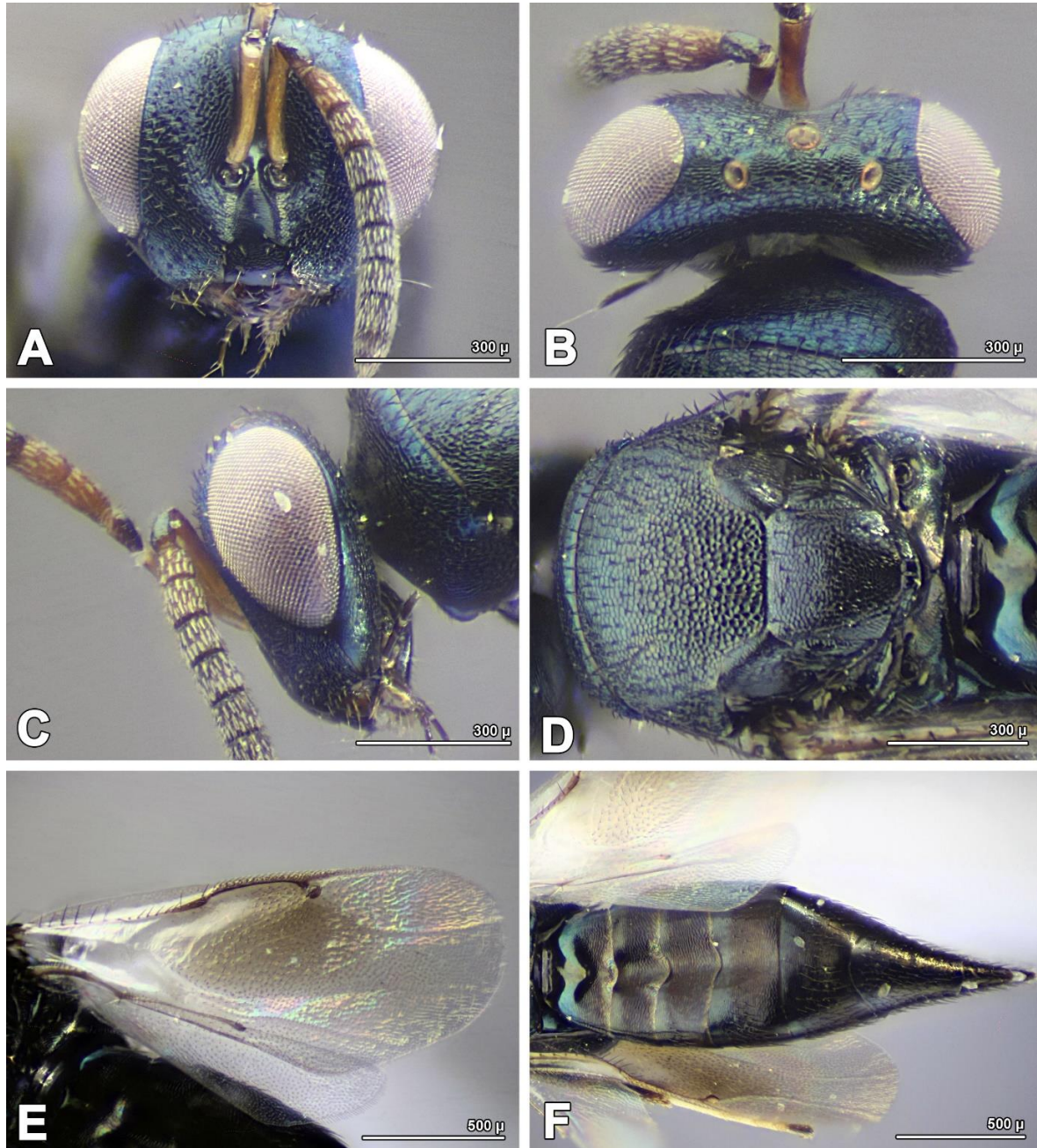


Figure 2. *Colotrechnus subcoeruleus* Thomson, 1878. **A.** Head, frontal view; **B.** Head, dorsal view; **C.** Head, lateral view; **D.** Mesosoma, dorsal view; **E.** Fore wings; **F.** Metasoma, dorsal view.

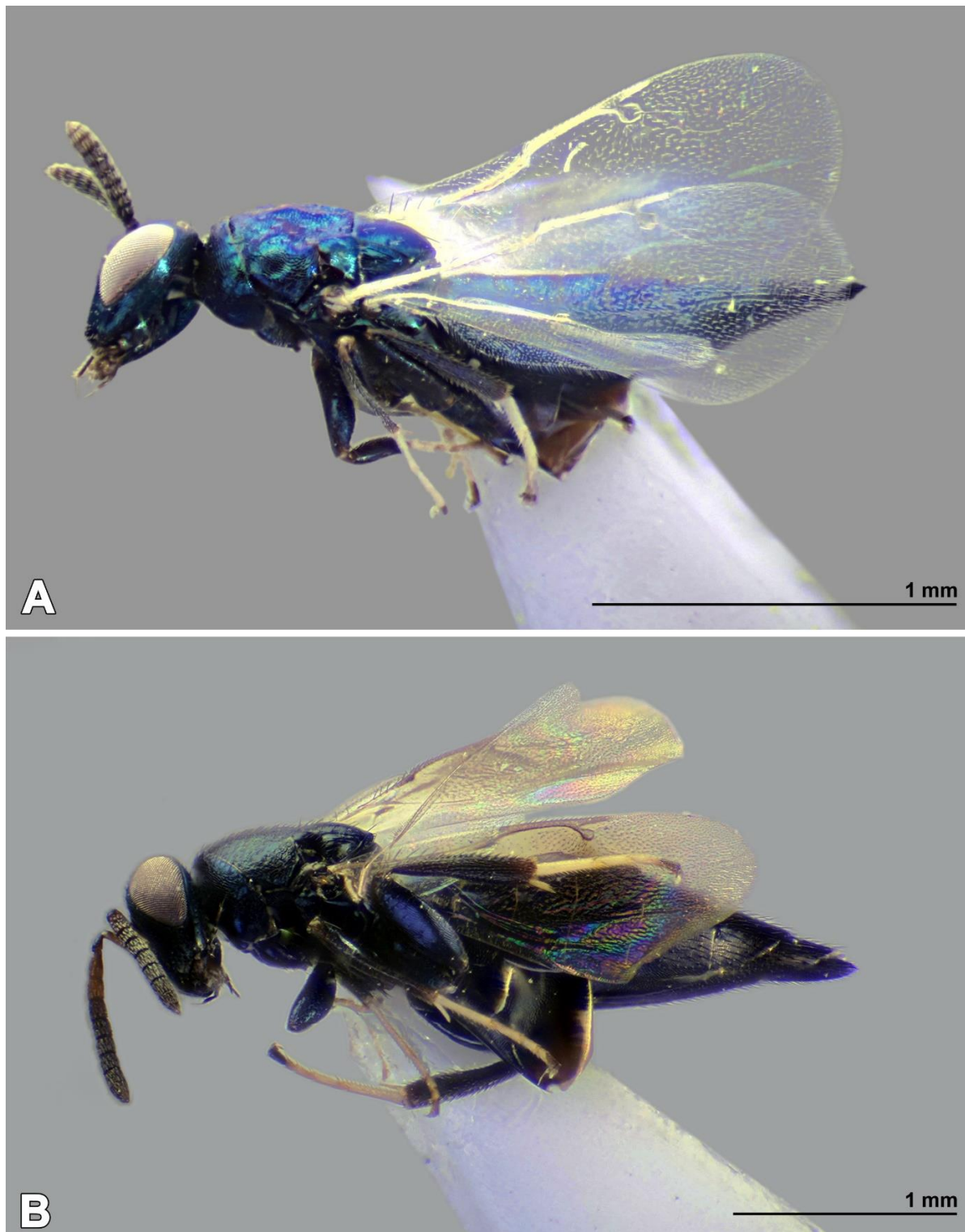


Figure 3. General habitus, lateral view. **A.** *Colotrechnus viridis* (Masi, 1921); **B.** *Colotrechnus subcoeruleus* Thomson, 1878.

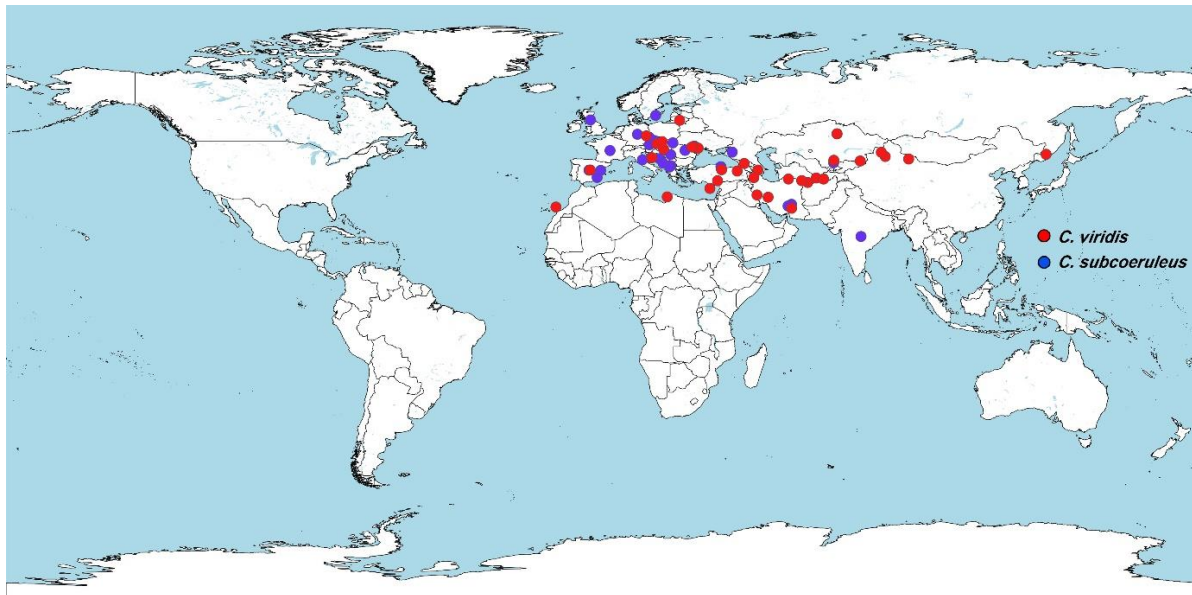


Figure 4. Worldwide deistribution map of *Colotrechnus viridis* (Masi, 1921) and *Colotrechnus subcoeruleus* Thomson, 1878.

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Conflict of Interests

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

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جنس *Colotrechnus* Thomson, 1878 (Hymenoptera: Pteromalidae) در استان‌های شمال شرق و جنوب شرق ایران

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چکیده: گونه‌های جنس *Colotrechnus* Thomson, 1878 (Hym., Pteromalidae)

در مناطق شمال شرق (خراسان شمالی) و جنوب شرق (کرمان) ایران بررسی شدند. دو گونه، شامل *Colotrechnus subcoeruleus* Thomson, 1878 و *Colotrechnus viridis* (Masi, 1921) در این مناطق شناسایی شدند، که از بین آنها گونه اول برای اولین بار از ایران گزارش می‌شود. یافته‌های این تحقیق، نشان دهنده پراکنش این جنس در یک منطقه گسترده در استان‌های شرقی ایران است. کلید شناسایی مصور برای گونه‌های شناخته شده ایران به همراه توصیف افتراقی مختصر برای هر گونه ارائه شد. نقشه انتشار در سراسر منطقه پالئارکتیک نیز تهیه و مورد بحث قرار گرفت.

واژگان کلیدی: Colotrechninae، پارازیتوئید، مگس میوه، گزارش جدید، کلید شناسایی، خراسان شمالی، کرمان