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ESI

## Review of the genus *Notanisis* Walker, 1837 (Hymenoptera: Pteromalidae) in Iran

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**ABSTRACT.** The species of *Notanisis* Walker (Hymenoptera: Pteromalidae: Cleonyminae) from Iran were revised. Four Palaearctic species are recognized: *N. clavatus* Bouček, *N. oulmesiensis* (Delucchi), *N. vanharteni* Gibson and *N. versicolor* Walker; including one species with macropterous male and the rests with macropterous females. Of which, *N. oulmesiensis* and *N. versicolor* are new records for Iran. The species are briefly described based on available materials, illustrated through macrophotography, and their distributions in Iran was mapped.

**Key words:** Chalcidoidea, Cleonyminae, new record, Middle East

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### Introduction

In the family Pteromalidae, the genus *Notanisis* Walker, 1837 was established with *N. versicolor* Walker in the subfamily Cleonyminae and tribe Cleonymini (Gibson, 2003). This genus includes 18 species in the World (Gibson, 2015; Noyes, 2019) with eight species in the Palaearctic region (Mitroiu & Andreescu, 2008; Gibson, 2015). Only *Notanisis vanharteni* Gibson, 2015 was known from Iran prior to this study (Lotfalizadeh et al., 2017; Abolhasanzadeh et al., 2017).

Bouček (1961) described *Notanisis clavatus* and compared it with *N. versicolor*. Mitroiu & Andreescu (2008) analyzed the morphology of the male genitalia in *N. sexramosus* and *N. versicolor* and presented

a key to species for determination of four species in Europe. Gibson (2015) designated the *oulmesiensis* species group of *Notanisis*. He revised this group and described five new species in this group from different regions, providing key to nine species.

Among the recently collected specimens from different parts of Iran, we found two new records that are purpose of the present publication.

### Material and methods

This study is based on material collected during 2012–2016 from different parts of Iran. Collected specimens were card-mounted following Noyes (1982). Prepared

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specimens were examined by a Leica M205C research stereomicroscope and Leica CLS 150X fiber optic light source. Generic identification was made using [Graham \(1969\)](#) and [Bouček & Rasplus \(1991\)](#) and species were identified using [Bouček \(1961\)](#), [Mitroiu & Andreescu \(2008\)](#), [Gibson \(2015\)](#). All species were photographed with a Keyence VHX-5000 multiple-focus imaging system; and finally deposited in the HMIM (Hayk Mirzayans Insect Museum, Tehran, Iran).

## Results

Iranian species of the genus *Notanisis* include four species that two of these species belong to the *oulmesiensis* species group. *Notanisis oulmesiensis* (Delucchi) and *Notanisis versicolor* Walker are new records for Iran. All of collected specimens were macropterous including three females and one male. Species are arranged alphabetically:

### *Notanisis clavatus* Bouček, 1961 (Fig. 1)

**Examined material:** IRAN, West-Azarbaijan province, Piranshahr (36°35'35" N, 45°10'32" E), 31.VIII.2016, Malaise trap, M. Asadi-Farfar leg., 1♀.

**Remarks.** This Mediterranean species distributed from Europe to Transcaucasus ([Gibson, 2003](#); [Mitroiu & Andreescu, 2008](#)). [Gibson \(2015\)](#) reported four male specimens of this species from Iran, which was identified by Z. Bouček in 1989 and deposited in the Canadian National Collection of Insects, Arachnids and Nematodes, Ottawa, Ontario, Canada (CNC).

Our studied female has all of morphological characters of *N. clavatus* described by [Bouček \(1961\)](#) and its brief description is as follow: head less transverse (Fig. 1D), width about 1.3 times of width of mesoscutum; antennal anellus quadrate (Fig. 1C); scutellum very finely and densely reticulate (Fig. 1F);

propodeum distinctly reticulate, its median carina complete (Fig. 1F); petiole transverse; postmarginal and stigmal veins long, marginal vein at most about 4.5 times of stigmal vein (Fig. 1E). In addition, infusate area of fore wing covered with modified darkish-brown hairs distinctly scale-like (Fig. 1B), that was not mentioned by [Bouček \(1961\)](#) and [Mitroiu & Andreescu \(2008\)](#). The rest of wing covered with whitish usual hairs.

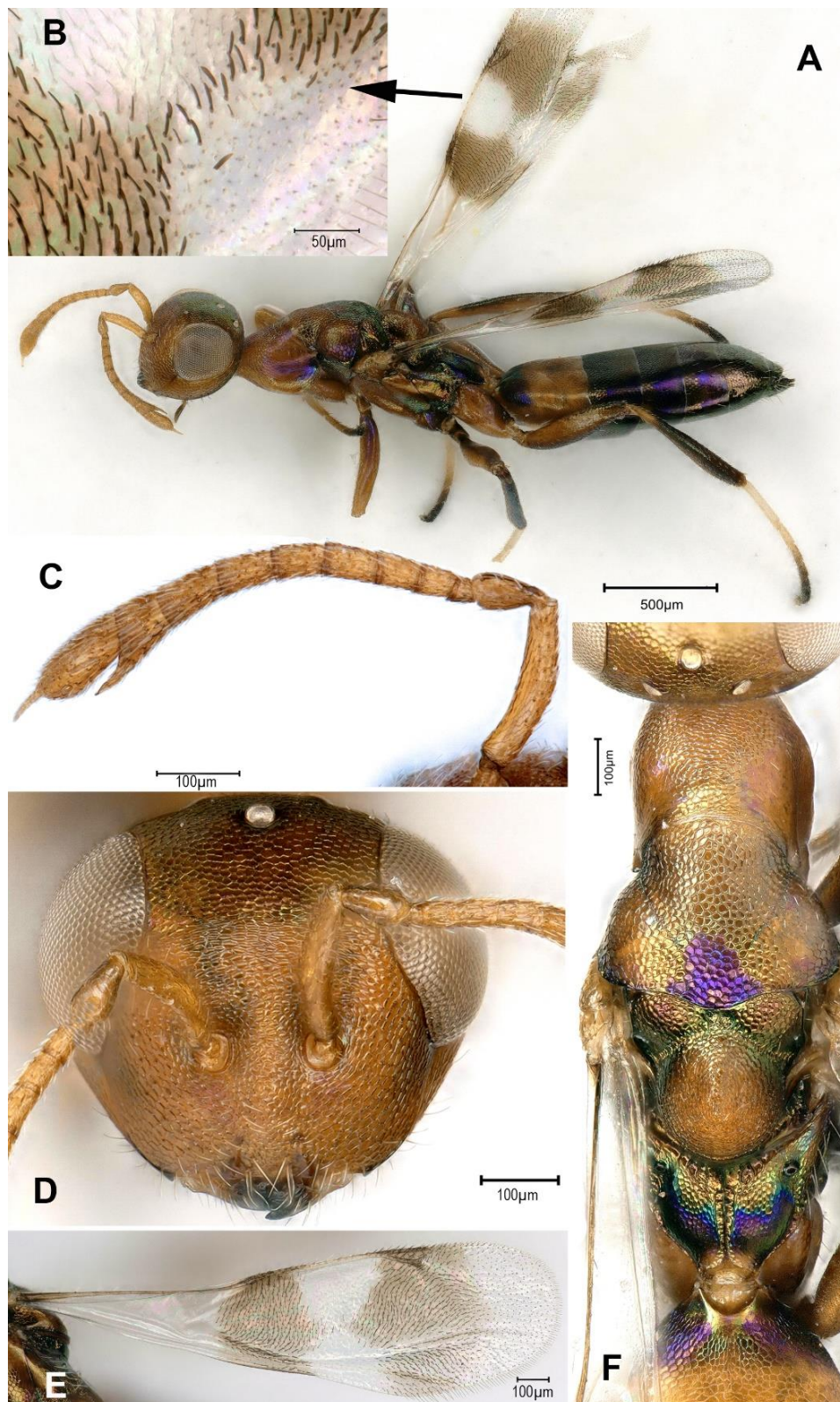
### *Notanisis oulmesiensis* (Delucchi, 1962) (Fig. 2)

**Examined material:** IRAN, Isfahan province, Najafabad (32°35' N, 51°18' E) 01.V.2013, Malaise trap, H. Lotfalizadeh leg., 1♀.

**Remarks.** This species with having shorter stigmal and postmarginal veins belongs to the *oulmesiensis* species group. *Notanisis oulmesiensis* is widely distributed in the West-Palaeartic ([Mitroiu & Andreescu, 2008](#); [Gibson, 2015](#)) but has not been reported from Iran. It is parasitoid of xylophagous beetles of the families Buprestidae and Curculionidae ([Gibson, 2015](#)).

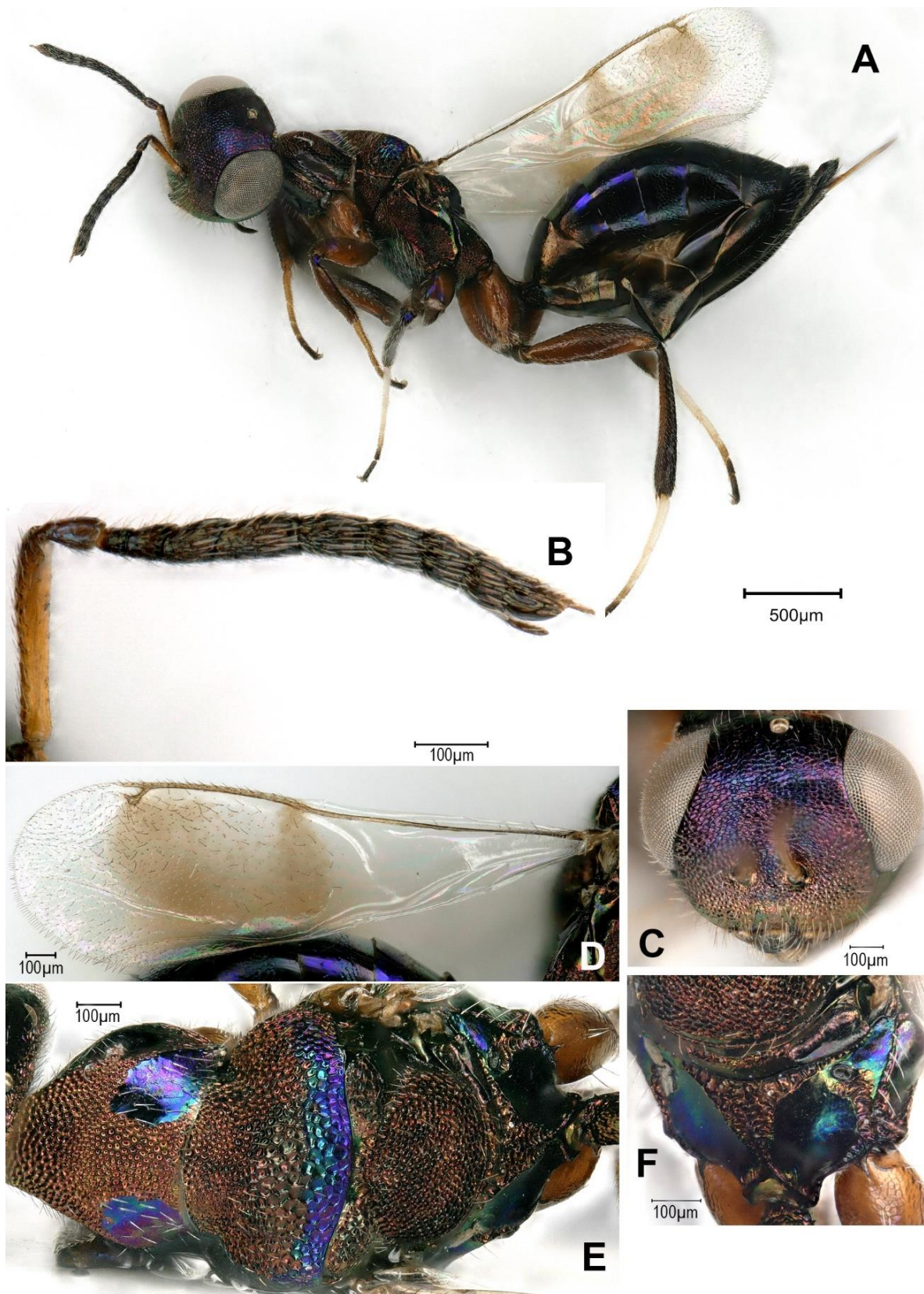
Main morphological characters of this species are as follow: Head less transverse (Fig. 2C), width about 1.3 times of width of mesoscutum and in face and frontovertex extensively reddish-violaceous; pronotum posterolaterally and propodeum submedially with large, triangular, violaceous and smooth areas (Fig. 2E); fore wing (Fig. 2D) with infusate region obviously interrupted by hyaline region behind marginal vein subbasally, postmarginal and stigmal veins equal and very short, marginal vein about 7 times of stigmal vein; propodeum (Fig. 2F) reticulate medially and smooth laterally, its median carina complete; petiole longer than broad; metacoxa yellowish to dark-brown dorsally but without metallic luster.





**Figure 1.** *Notanisus clavatus*: **A.** female in lateral view; **B.** Scale-like setae of fore wing; **C.** Female antenna; **D.** Head in frontal view; **E.** Fore wing; **F.** Mesosoma and first segment of metasoma in dorsal view.





**Figure 2.** *Notanisis oulmesiensis*: A. female in lateral view; B. Female antenna; C. Head in frontal view; D. Fore wing, E. Mesosoma in dorsal view; F. propodeum in dorsal view.

*Notanisus vanharteni* Gibson, 2015 (Fig. 3)

**Examined material:** IRAN, Fars province, Shurjestan (30°49' N, 51°51' E) 2030m, 20.VI.2012, ex *Dorema ammoniacum* (D. Don.) (Apiaceae), S.A. Alehosein leg., 1♀.

**Remarks.** This species was described originally from Arabian Peninsula and based on recent report of Lotfalizadeh et al. (2017) occurs in the south of Iran. Gibson (2015) treated it in the *oulmesiensis* species group.

Brief description of *N. vanharteni*: Head in frontal view and mesosoma broadly reddish-violaceous (Fig. 3B) while in type materials mentioned reddish-coppery (Gibson, 2015; see Figs 63, 64); gena and lower face strongly sculptured and colored, OOL about 1.3 times of maximum diameter of posterior ocellus; pronotum posterolaterally with large, triangular, smooth or at most finely coriaceous but shiny differentiated region bearing several conspicuous setae (Fig. 3D); scutellum entirely punctulate-reticulate with larger reticulations laterally and posteriorly; propodeum with medial sculptured region entirely rugulose-reticulate along length of median carina and large, triangular, greenish-violaceous smooth differentiated region (Fig. 3D); metacoxa yellowish-brown without metallic luster, dorso-basally with patch of several setae; fore wing with broad infusate region behind discal venation, slightly interrupted by hyaline region behind marginal vein subbasally (Fig. 3E).

*Notanisus versicolor* Walker, 1837 (Fig. 4)

**Examined material:** IRAN, West-Azarbaijan province, Piranshahr (36°35'35" N, 45°10'32" E), 31.VIII.2016, Malaise trap, M. Asadi-Farfar leg., 1♂.

**Remarks.** *Notanisus versicolor* is a Mediterranean species, which distributed in Europe (Mitroiu & Andreescu 2008).

Bouček (1988) reported it on grass gall-maker wasps, *Tetramesa* (Hym.: Eurytomidae).

This macropterous species with long postmarginal and stigmal veins and marginal vein, about 2.5 times of stigmal vein, includes to the *oulmesiensis* species group.

Males of *N. versicolor* with 5 lateral branches of antennal funicle (Fig. 4D) and longer petiole (longer than broad) (Fig. 4E) can be separated from *N. sexramosus* (Erdős), its closely related species. Mitroiu & Andreescu (2008) believe that the males of *N. versicolor* appear to be much more common than the females that seems to be supported in our collection in Iran.

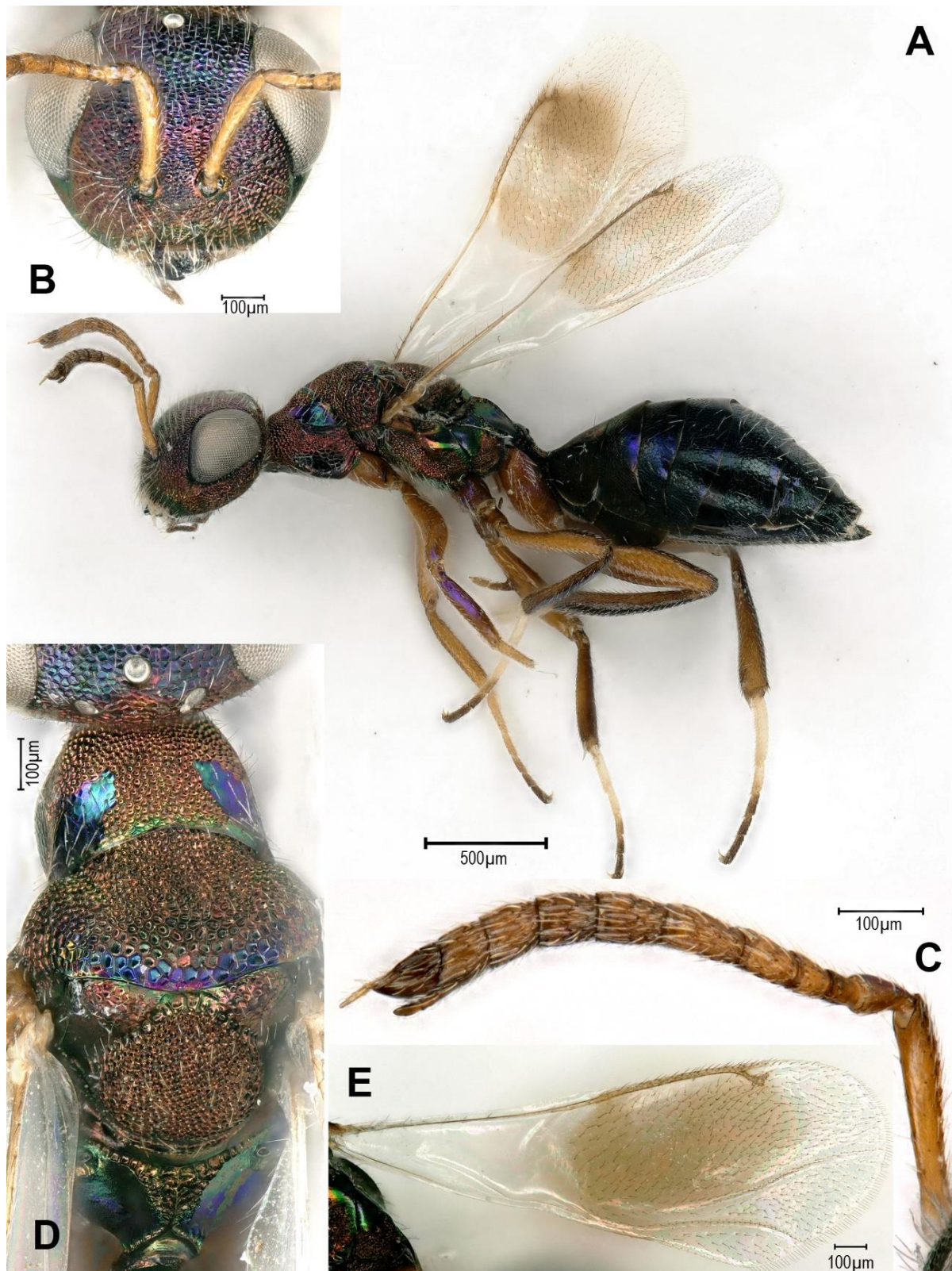
Based on Mitroiu & Andreescu (2008) and Bouček (1961) females have following characters: Head less transverse, about 1.3-1.4 times width of mesoscutum (Fig. 4B); antennal ring transverse; scutellum less finely and densely reticulate (Fig. 4E); petiole elongated, about 1.5 times as long as broad, longer than half of the median length of propodeum; median carina of propodeum complete, propodeum except along the median carina, slightly reticulate (Fig. 4C) while Mitroiu & Andreescu (2008) mentioned smooth and shiny; postmarginal vein longer than stigma vein, fuscous bands widely separated.

Male likes female except following differences: Funicle with 5 long lateral branches (Fig. 4A, 4D); petiole longer than broad (Fig. 4E).

## Discussion

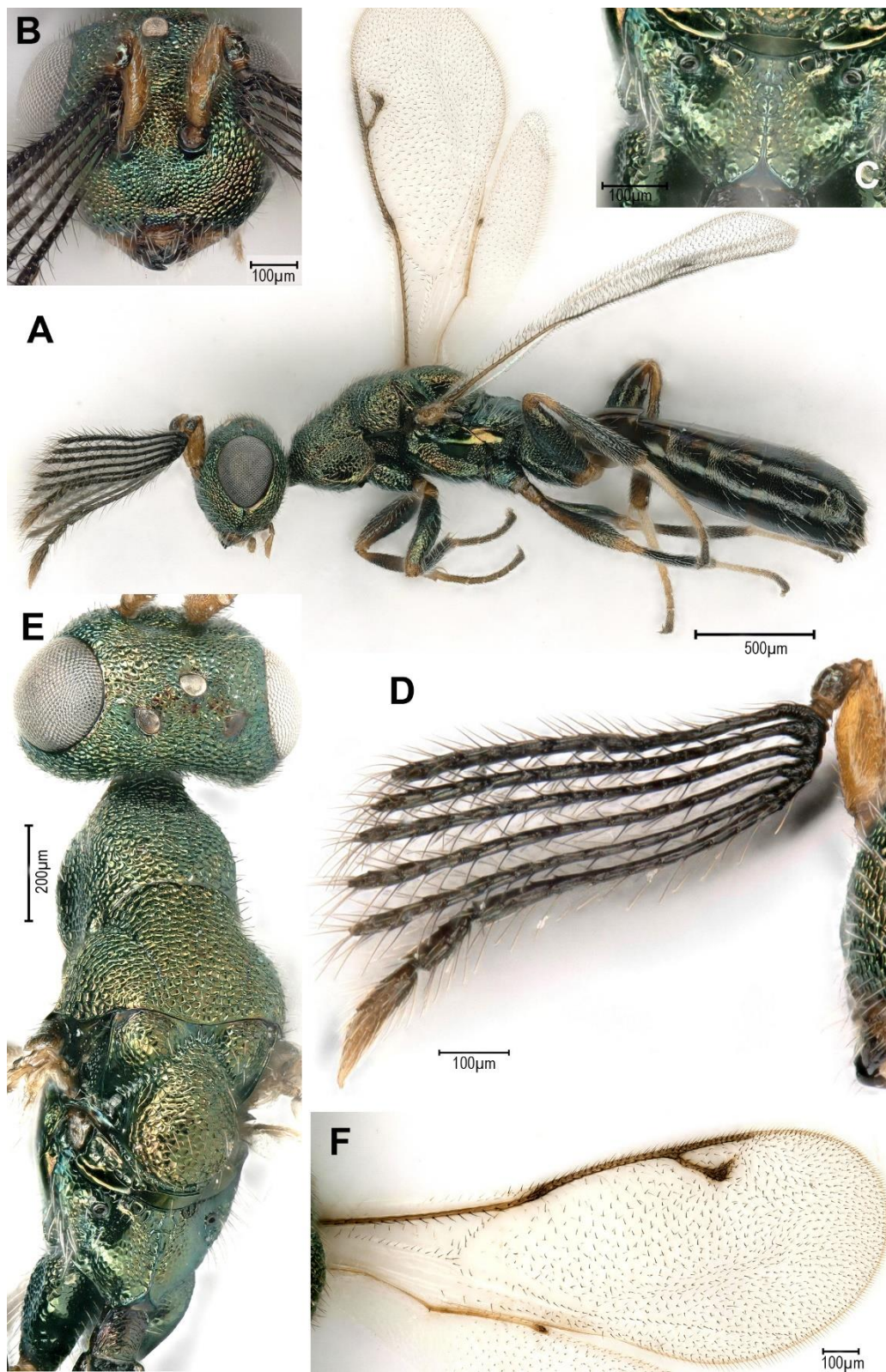
Four Palaearctic species of *Notanisus* are present in Iran, *N. oulmesiensis* and *N. versicolor* being now reported for the first time. Therefore, Iranian species of the genus reaches four species, which further collections, especially in the south and east of Iran can increase number of species.





**Figure 3.** *Notanisisus vanharteni*: A. Female in lateral view; B. Head in frontal view; C. Female antenna; D. Mesosoma in dorsal view; E. Fore wing.





**Figure 4.** *Notanisus versicolor*: A. Male in lateral view; B. Head in frontal view; C. propodeum; D. Male antenna; E. Head, mesosoma and petiole in dorsal view; F. Fore wing.



Species of the genus *Notanisis* rarely found in Iran and based on our collections are mostly collected in the northwest and central parts of Iran (Fig. 5).

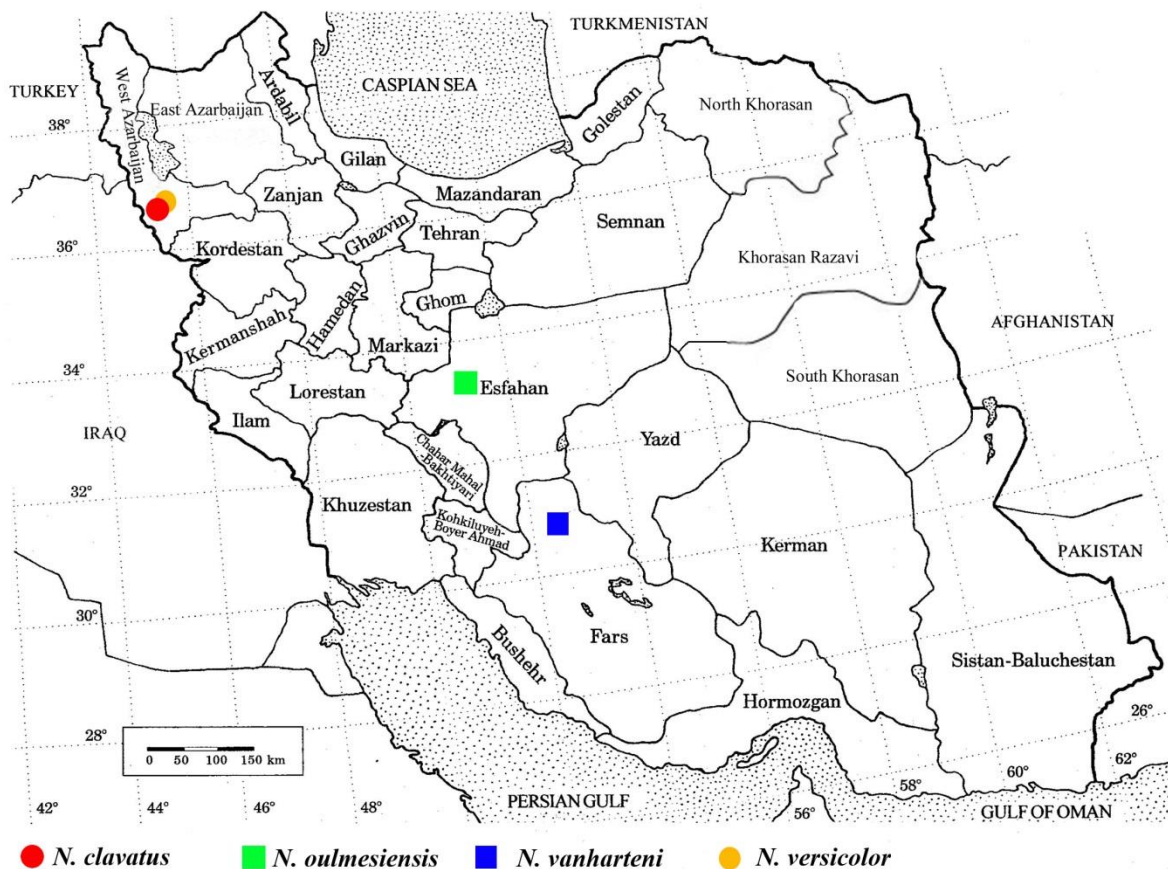
Mitroiu & Andreescu (2008) reported most distribution of the genus *Notanisis* in the steppe areas, which our collected specimens were found in the steppe biotopes alongside of Zagros mountain chain in the west of Iran.

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### Conflict of Interests

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



**Figure 5.** Map of Iran including distribution of four *Notanisis* species.

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## مروری بر جنس *Notanisis* Walker, 1837 (Hymenoptera: Pteromalidae) در ایران

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**چکیده:** گونه‌های متعلق به جنس *Notanisis* Walker (Hymenoptera: Pteromalidae: Cleonyminae) در ایران مورد بررسی قرار گرفتند. چهار گونه از گونه‌های متعلق به منطقه پالئارکتیک شامل *N. clavatus* Bouček، *N. oulmesiensis* (Delucchi)، *N. vanharteni* Gibson و *N. versicolor* Walker شناسایی شدند، که شامل نر یک گونه و افراد ماده سایرین بود. از بین آنها دو گونه *N. oulmesiensis* و *N. versicolor* برای نخستین بار از ایران گزارش می‌شوند. هر کدام از گونه‌ها براساس نمونه‌های مورد دسترس، بطور خلاصه شرح داده شده، تصاویر هر کدام فراهم شده و نقشه پراکنش گونه‌ها در ایران تهیه گردید.

**واژگان کلیدی:** Chalcidoidea، Cleonyminae، گزارش جدید، خاورمیانه