



Chrysomalla roseri Foerster (Hymenoptera, Chrysolampidae), evidence for occurrence of the family, genus and species in Iran

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ABSTRACT. The family Chrysolampidae Dalla Torre, 1898 and the genus *Chrysomalla* Foerster, 1859 (Chalcidoidea, Chrysolampidae, Chrysolampinae) are recorded for the first time from Iran where it was represented by one species, *Ch. roseri* Foerster, 1859. Studied specimens were collected with sweeping net in three localities: Kerman, South-Khorasan and West-Azərbayjan provinces in the east and northwest of Iran, respectively. A brief diagnosis, with illustrations of the morphological characters and geographical distribution is provided for this species.

Key words: Chalcidoidea, distribution, parasitoid, fauna

Received:

27 April, 2023

Accepted:

23 May, 2023

Published:

26 May, 2023

Subject Editor:

Majid Fallahzadeh

Citation: Lotfalizadeh, H., Farhangi, V. & Rasplus, J.-Y. (2023). *Chrysomalla roseri* Foerster (Hymenoptera, Chrysolampidae), evidence for occurrence of the family, genus and species in Iran. *Journal of Insect Biodiversity and Systematics*, 9 (3), 549–558.

INTRODUCTION

The newly erected family, Chrysolampidae was separated from the family Perilampidae based on phylogenetic study of their planidial larvae (Zhang et al., 2021). This family include two subfamilies Chrysolampinae and Philomidinae. Within this family, the genus *Chrysomalla* Foerster, 1859 with 14 species in the world is one of the larger genera of the family (Noyes, 2019). The biology of the genus is mainly unknown. This genus characterized by malar space at least third of eye length; pronotum with distinct pronotal collar carina, followed with a row of coarse piliferous puncture; mesoscutum mainly transversally strigose; fore wing bare in the basal third; gaster sessile.

Key to the species of *Chrysomalla* of the Palaearctic region was published by Graham (1969), Bouček (1972), Zerova (1973), Dzhankmen (1981), and Askew et al. (2001). Consequently, Dzhankmen (2007) and Doğanlar & Doğanlar (2012) published keys to the 5 and 12 Palaearctic species of *Chrysomalla*, respectively. The aim of the present research is to report our recent findings about this genus in Iran.

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MATERIAL AND METHODS

During the collection of Chalcidoidea different regions of Iran, three specimens were swept in the east and northwest of Iran. We used a Nikon® SMZ645 stereomicroscope for the point-mounting of specimens using the method suggested by Noyes (1982). An Olympus™ SZH with a Leica LED ring light source was used for specimen observation. Bouček (1972) and Dzhankmen (1978) were used for the identification of *Chrysomalla* and also keys to species of Dzhankmen (2007) and Doğanlar & Doğanlar (2012) for specific determination. Terminology of morphological characters generally follows Bouček (1956), Bouček and Rasplus (1991), and Gibson (1997). External morphology was illustrated using a Keyence VHX-5000 digital microscope and then the plates were composed in Photoshop CS4, after doing all necessary image processing. Specimens were deposited in the collection of the Hayk Mirzayans Insect Museum, Iranian Research Institute of Plant Protection, Tehran, Iran (HMIM).

RESULTS

Our examined specimens were identified as *Chrysomalla roseri* Foerster, which has not been documented in Iran. This species is type species of the genus *Chrysomalla*.

Taxonomic hierarchy

Order Hymenoptera Linnaeus, 1758

Superfamily Chalcidoidea Latreille, 1817

Family Chrysolampidae Dalla Torre, 1898

Subfamily Chrysolampinae Dalla Torre, 1898

Genus *Chrysomalla* Foerster, 1859

***Chrysomalla roseri* Foerster, 1859 (Figs 1, 2, 3, 4)**

Chrysolampus roseri Foerster, 1859:116–117. Holotype ♂.– Germany, Naturhistorisches Museum, Vienna.

Materials examined. Iran, South-Khorasan, Birjand, Mohammadiyah, 17.vii.2016, V. Farhangi leg., 1♀. West-Azarbaijan, Urmia, Kahriz (37°53'35"N, 45°15'07"E, 1321 m), swept on *Phragmites*, viii.2014, V. Farhangi leg., 1♂. Kerman, Anarestan (30°29'58"N, 57°17'28"E, 1932 m), v.2022, V. Farhangi leg., 1♂.

Description (Iranian specimens). Diagnostic characters were presented in a comparative form with previously published papers (Bouček, 1972; Dzhankmen, 2007; Doğanlar & Doğanlar, 2012):

FEMALE (Figs 1–2) — Body length of female 2.18 mm. **Color.** Body dark green, with golden reflection, except mandible, all femora distally, tibiae and tarsi yellow. Antenna entirely metallic [scape yellow basally (Doğanlar & Doğanlar, 2012)]. Fore wing venation with distinct pilosity and with a slight fouscus large spot below parastigmal, marginal and stigmal veins; basal third of fore wing bare and the last two thirds distinctly setose. Stigmal and parastigmal veins enlarged, darker than the other venations.

Head (Fig. 2B). 1.24 times as long as broad. Eye 2.4 times as long as malar space [2.3–2.7 times (Bouček, 1972)]. Head circularly strigose [finely reticulated with fine punctations (Doğanlar & Doğanlar, 2012)]. Clypeus (Fig. 4D) smooth, shiny, with a row of piliferous punctures in dorsal margin and with two piliferous punctures near to ventral margin [with 2 piliferous punctures close to anterior margin and 2 light ones on the base (Doğanlar & Doğanlar, 2012)], ventrally with more than 10 deformed clavate setae in female (Fig. 4D) [not seen in male (Fig. 4C)]. Mandibles bidentated, with subbasal clavate seta internally (in male and female) (Figs 4C–4D). Antennal pedicel and flagellum together about 0.75 times as long as head width [0.7 times as long as head width (Doğanlar & Doğanlar, 2012)], as long as eyes distance. Scape 5.5 times as long as wide, pedicel 1.4 times as long as wide (Fig. 1B) [5.4 and 1.6 times, respectively (Doğanlar & Doğanlar, 2012)]; funiculars distinctly transverse with one row of linear sensillae, first funicular with less dense sensillae than the rest; first funicular 0.63 times as long as wide, second - seventh funiculars about 0.66–0.70 times as long as wide; club 1.8 times as long as wide [1.4 times as long as wide (Doğanlar & Doğanlar, 2012)].

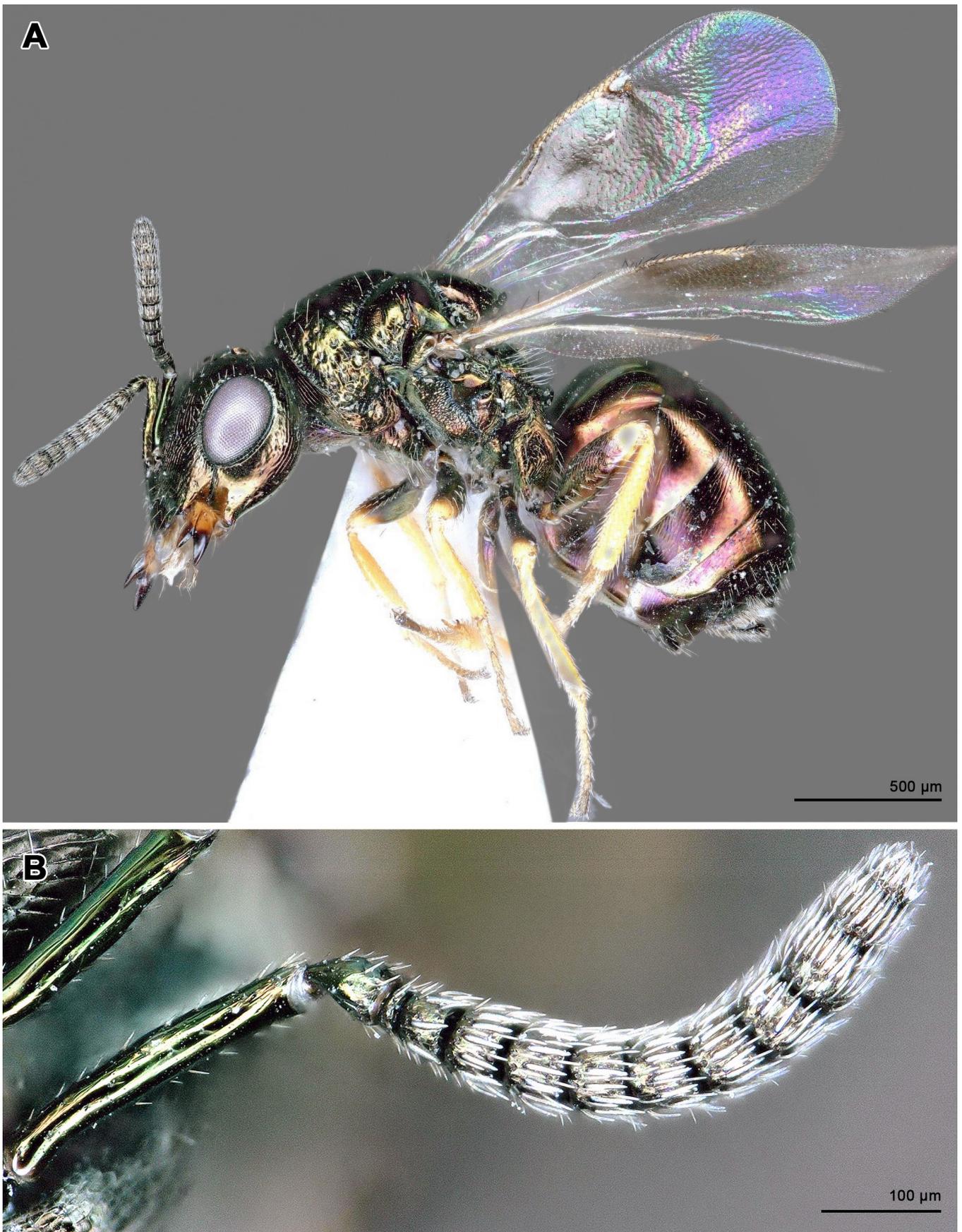


Figure 1. *Chrysomalla roseri* Foerster, 1859. **A.** Female in lateral view; **B.** Female antenna.

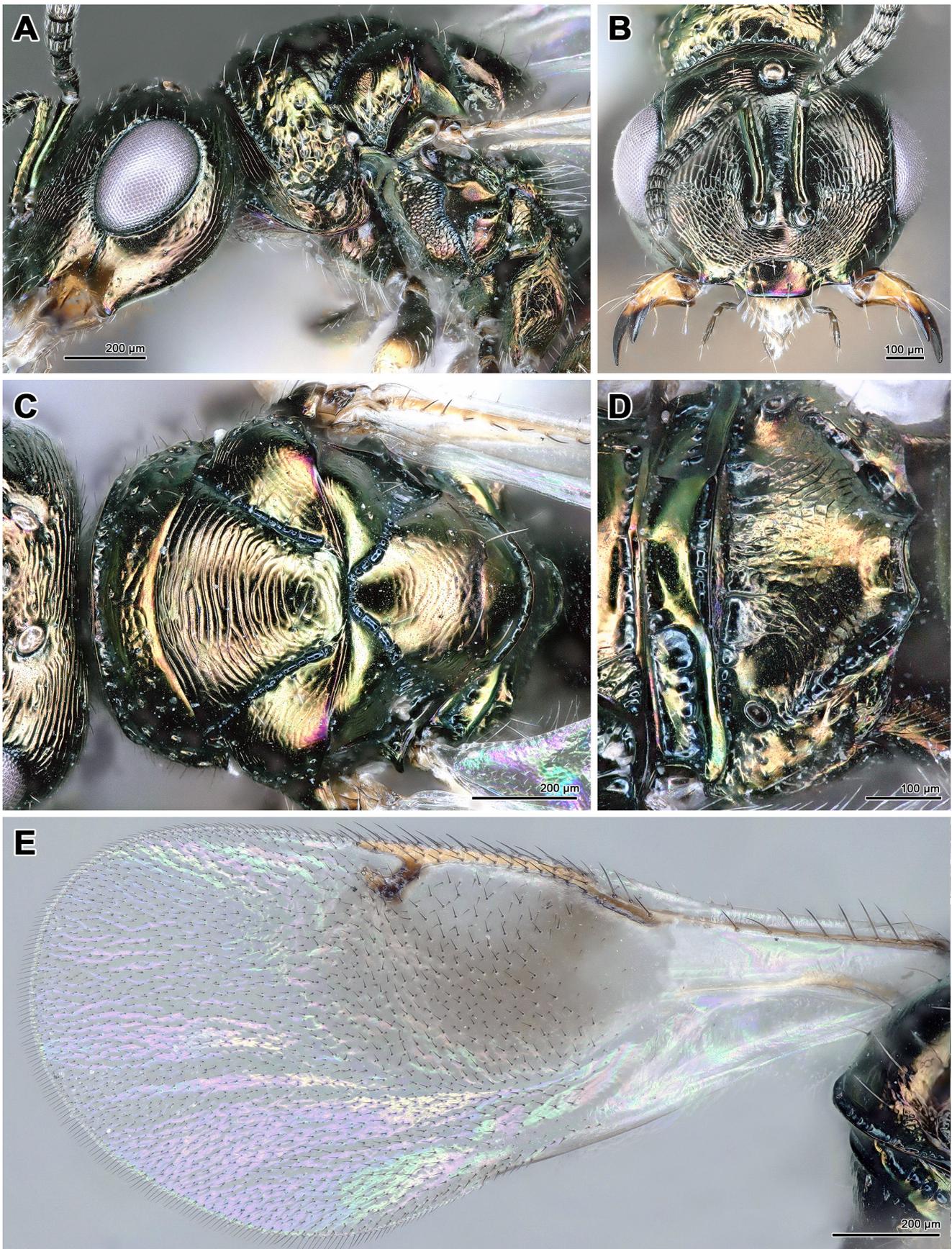


Figure 2. *Chrysomalla roseri* Foerster, 1859. **A.** Head and mesosoma in lateral view; **B.** Head in frontal view, **C.** Mesosoma in dorsal view; **D.** Propodeum in dorsal view; **E.** Fore wing.

Mesosoma (Figs 2A, 2C, 2D). Pronotum with piliferous punctures (Figs 2A, 2C), 0.88 times as broad as mesoscutum. Notaulus distinctly impressed and obliterated by piliferous punctures (Fig. 2C). Mesoscutal midlobe mainly transversally strigose, with sparse piliferous punctures, 0.49 times as long as broad; mesoscutal lateral lobe slightly strigose (Fig. 2C). Mesoscutellum smooth (especially on frenum), 0.8 times as long as broad, with shallow trace of striation in anterior half. Propodeum (Fig. 2D) delicately reticulate, 2.13 times as long as broad, with incomplete and barely visible median and submedian carinae [without median carina (Doğanlar & Doğanlar, 2012)]. Fore wing (Fig. 2E) with basal cell bare; marginal vein 3 times as long as postmarginal vein and 4 times as long as stigmal vein [3.7 and 4.3 times, respectively (Doğanlar & Doğanlar, 2012)]. Hind tibial spur weak and shorter than first tarsal segment.

Metasoma. Metasoma 1.18× as long as mesosoma. Petiole very short, strongly transverse. Gaster with very shallow strigose sculpture. Tip of hypopygium almost reaching apex of gaster. Ovipositor very short but slightly visible at apex of gaster.

MALE (Fig. 3) — Body length 1.88–2.40 mm [2 mm (Doğanlar & Doğanlar, 2012)]. Similar to female except following: Body bright green, with golden reflection (Fig. 3). Antenna with flagellar segments with less linear sensillae and less transverse than female. Clypeus (Fig. 4C) without deformed clavate setae at ventral margin (female with 10 clavate setae).



Figure 3. *Chrysomalla roseri* Foerster, 1859. Male in lateral view.

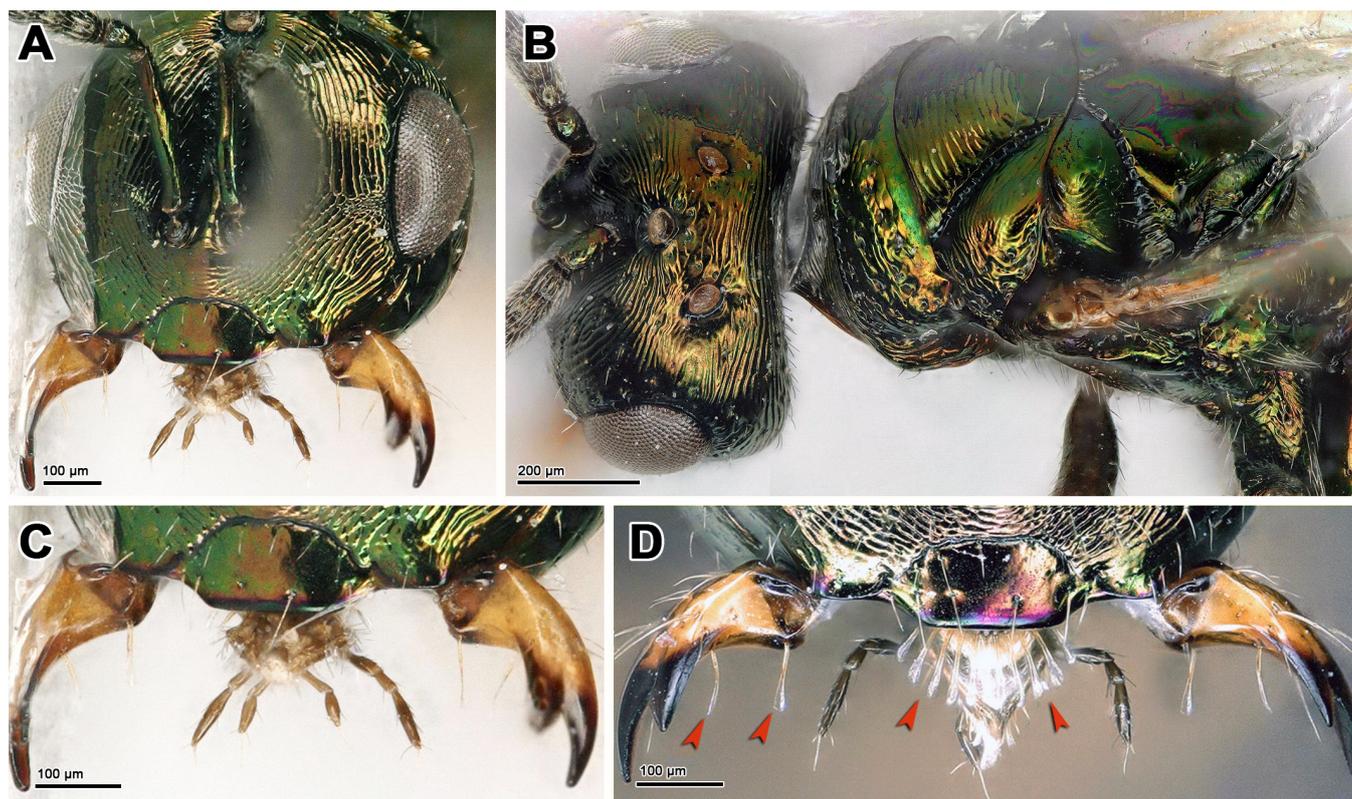


Figure 4. *Chrysomalla roseri* Foerster, 1859. **A.** Head in frontal view, male; **B.** Head and mesosoma in dorsal view, male; **C.** Clypeus and mandibles, male; **D.** Clypeus and mandibles, female.

DISCUSSION

Our studied specimens were collected by sweeping net on different plants in Iran. Nikol'skaya (1952) reared the specimens of *Chrysomalla roseri* from the lucerne seed weevil, *Tychius flavus* Becker, 1864 (Coleoptera, Curculionidae). Several species of weevils of the genus *Tychius* have been reported on Papilionaceae in Iran, including *Tychius astragali* Becker, *T. aureoles* Kiesenwetter, *T. bicolor* Brisout, *T. bisquamosus* Pic, *T. cuprifer* (Panzer), *T. flavus* Becker, *T. reitteri* Faust, *T. tridentinus* Penecke (Sadeghi, 2016), which can be potential hosts for *C. roseri* (Fig. 5). *Chrysomalla roseri* is distributed in some European, Middle East and Central Asian countries (Nicol'skaya, 1952; Erdös, 1955; Hoffer & Nowicky, 1955; Bouček, 1956, 1972; Graham, 1969; Doğanlar, 1984; Kalina, 1989; Öncüer, 1991; Askew et al., 2001; Džhanokmen, 1978, 2007). It is a new record for Iran, widely distributed in the northwest, East and center of Iran (Fig. 5) with distinctly different ecological conditions. The early mention of *Chrysomalla roseri* as an element of Iranian fauna (Ghahari & Huang, 2016) should be considered as unreliable record. We believe the validity of new recordings is important for maintaining the stability and clarity of scientific communication and knowledge. It depends on the accuracy and reliability of the data and methods used to document and identify the organisms. It also depends on compliance and consistency with the nomenclatural codes and standards that regulate the creation and publication of new names. Scientifically, any newly recorded species must be deposited in a museum with a voucher specimen. A new geographical record should be re-verifiable by independent sources, such as taxonomic authorities, peer-reviewed journals, or online databases. Therefore, a voucher specimen should be deposited in an accessible collection, where it can be studied and verified by other researchers. Our attempts to contact the above mentioned authors in order to getting access to the voucher specimens were unsuccessful. Unfortunately, during the recent decade, many species of the Iranian fauna were recorded without a distinct collection locality and without reference to the depository, so that the voucher specimens are mainly unavailable.



Figure 5. Distribution map of *Chrysomalla roseri* Foerster, 1859 in the world and in Iran.

AUTHOR'S CONTRIBUTION

The authors confirm their contribution in the paper as follows: H. Lotfalizadeh: identification of the specimens, and preparation of the photographs; writing the manuscript and correspondence; V. Farhangi: sampling and mounting of the specimens; J.-Y. Rasplus: confirming the identity of specimens and revising the manuscript; All authors read and approved the final version of the manuscript.

FUNDING

This research received no specific grant from any funding agencies.

AVAILABILITY OF DATA AND MATERIAL

The specimens listed in this study are deposited in the collection of the Hayk Mirzayans Insect Museum, Iranian Research Institute of Plant Protection, Tehran, Iran (HMIM) and are available from the curator, upon request.

ETHICS APPROVAL AND CONSENT TO PARTICIPATE

Not applicable.

CONSENT FOR PUBLICATION

Not applicable.

CONFLICT OF INTERESTS

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

ACKNOWLEDGMENTS

The authors are grateful to Iranian Research Institute of Plant Protection (IRIPP), for providing all of the facilities for laboratory studies. Our special gratitude to the editorial board of the JIBS for their efforts to develop the quality of the final version of the manuscript.

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زنبور *Chrysomalla roseri* Foerster (Hymenoptera, Chrysolampidae) گزارش جدید خانواده، جنس و گونه از ایران

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تاریخ دریافت: ۰۷ اردیبهشت ۱۴۰۲ | تاریخ پذیرش: ۰۲ خرداد ۱۴۰۲ | تاریخ انتشار: ۰۵ خرداد ۱۴۰۲ |

چکیده: خانواده Chrysolampidae Dalla Torre, 1898 و جنس *Chrysomalla* Foerster, 1859 تاکنون از ایران گزارش نشده‌اند. در این تحقیق از این جنس، یک گونه تحت عنوان *Chrysomalla roseri* Foerster, 1859 معرفی می‌گردد. نمونه‌های مورد مطالعه به وسیله تور حشره‌گیری از استان‌های کرمان، خراسان جنوبی و آذربایجان غربی به ترتیب در شرق و شمال غرب ایران جمع‌آوری شدند. خلاصه‌ای از مشخصات تفکیکی این گونه، به همراه تصاویر و پراکنش جغرافیایی آن ارائه شده است.

واژگان کلیدی: بالاخانواده کلسید، پراکنش، پارازیتوئید، فون