

Research Article

First occurrence of the genus *Harrizia* Delucchi, 1962 (Hymenoptera: Pteromalidae) in the border of East Palaearctic

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Abstract: The genus *Harrizia* Delucchi, 1962 is represented by a single species, *Harrizia mira* Delucchi, 1962. This is first record of *H. mira* from Iran in the border of Eastern Palaearctic region and also the first record of this genus from Asia. The specimens were collected from Sistan-o Baluchestan and Kerman provinces in the South East of Iran. Brief diagnosis and illustrations of *H. mira* is provided and its distribution is discussed.

Keywords: Hymenoptera, Chalcidoidea, new record, *Harrizia*, Asia, Iran

Introduction

The Miscogastrinae is one of the largest subfamilies in the family Pteromalidae with about 340 species in 36 genera, worldwide (Noyes, 2019). Most members of the subfamily are parasitoids of Diptera larvae, burrowing in or mining the soft tissues of various, mainly herbaceous plants (Bouček, 1988). *Harrizia* Delucchi, 1962 as a monotypic genus of Miscogasterinae (Hymenoptera: Pteromalidae), was described based on the specimens from Morocco, with the type species *Harrizia mira* Delucchi, 1962. It is distributed only in the West Palaearctic region (Noyes, 2019). *Harrizia* can be simply distinguished from other genera of Miscogasterinae by the antenna with quadrate first anellus, longer than the second; and very short clypeal teeth (Bouček and Rasplus, 1991).

So far, 66 genera and 142 species of Pteromalidae have been reported from Iran (Gibson, 2015; Abolhassanzadeh *et al.*, 2017; Moravvej *et al.*, 2018; Lotfalizadeh *et al.*, 2019a, 2019b; Rahmani *et al.*, 2019a, 2019b; Shojaey *et al.*, 2019). The subfamily Miscogastrinae is very poorly known in Iran, with only 12 species of three genera (Abolhassanzadeh *et al.*, 2017; Moravvej *et al.*, 2018). In the course of a faunistic study on Pteromalidae of Southeastern Iran, first occurrence of the genus *Harrizia* Delucchi in Iran and Asia is documented.

Materials and Methods

The material was collected using sweeping net from various habitats in Sistan-o Baluchestan and Kerman provinces in the South East of Iran, during 2013-2015. Collected specimens were preserved in 75% ethanol. They were subsequently prepared according to AXA method (Achterberg, 2009), which were already used for the braconids (Rahmani *et al.*, 2019c) and Ichneumonids (Zardouei Heydari *et al.*,

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2019). Prepared specimens were mounted on triangular cards and labeled. The card mounted specimens were studied under Nikon® SMZ645 stereomicroscope and illustrated using Canon® EOS 700D (Canon® Inc., Japan) mounted with an adapter on Hund® stereomicroscope (Wetzlar Inc., Germany). Identifications were done using the key in Bouček and Rasplus (1991). Terminology of morphological characters generally follows that of Graham (1969) and Bouček (1988). A map indicating the geographical distribution of this species is generated using SimpleMappr (Shorthouse, 2010). The studied specimens are deposited in the collection of Department of Plant Protection, University of Zabol, Iran (DPPZ).

Results

Taxonomic account

Family Pteromalidae Dalman, 1820

Subfamily Miscogasterinae Walker, 1833

Genus *Harrizia* Delucchi, 1962

Diagnosis. Clypeal teeth very short (Fig. 1A). Antenna with two anelli and six funicular segments, first anellus quadrate, longer than the second (Figs 2A, 2B). Notauli complete (Fig. 1D). Pronotum dorsally rounded-sloping, collar not margined (Fig. 1D). Propodeum shallowly and finely reticulate, with distinct median carina (Fig. 1F). Fore wing with very dense and extensive pilosity, with moderate speculum (Fig. 1E). Gaster sessile.

Harrizia mira Delucchi, 1962 (Figs 1-2)

Material examined. 36♀♀ 27♂♂: IRAN: KERMAN Province, Bam (29°05'55.00" N, 58°20'23.76" E, 1086 m. a.s.l.), swept on *Medicago sativa*, 22.03.2014, 4♀♀ 3♂♂; 24.03.2014, 2♂♂; 04.12.2013, 2♂♂; 25.06.2014, 2♂♂; 16.03.2014, 12♀♀ 13♂♂; swept on *Cynodon dactylon*, 29.04.2014, 4♀♀; 20.04.2015, 3♀♀;

03.04.2014, 5♀♀ 3♂♂; 24.03.2014, 3♀♀ 1♂, leg. M. Vafaei; SISTAN-o BALUCHESTAN Province: Zabol (31°01'59.02" N, 61°29'26.07" E, 483 m. a.s.l.), swept on weeds, 30.05.2015, 1♀, leg. M. Enayatnia; Nimrouz (31°06'02" N, 61°25'07" E, 461 m. a.s.l.), swept on *Medicago sativa*, 26.03.2015, 3♀♀ 1♂, leg. H.A. Derafshan; Nikshahr (26°13'34.90" N, 60°12'24.09" E, 641 m. a.s.l.), swept on *Trifolium resupinatum*, 27.03.2013, 1♀, leg. M. Danesh.

Diagnosis. Female. Body length 1.44 mm. Antenna inserted slightly below middle of face (Fig. 1A), all funicular segments (Fig. 2A) longer than width, first anellus 1.6 times the second. Eye height (frontal view - Fig. 1A) 2.3 times length of malar space. Width of head in dorsal view (Fig. 1B) 2.7 times its median length and 1.27 times wider than mesoscutum. Eye height (lateral view - Fig. 1C) 1.38 times its length. Notauli complete (Fig. 1D). Fore wing (Fig. 1E) postmarginal vein 1.02 times as long as marginal vein, 1.9 times as long as stigmal vein, stigma large. Propodeum (Fig. 1F) reticulate with complete median carina, plica absent. Petiole transverse. Gaster (Fig. 2C) shorter than mesosoma, hind margin of first, second and third gastral tergites excised medially, first tergite smooth, remainder of tergites weakly reticulate. Body bronze-copper with weak metallic green reflections (Fig. 2C).

Male (Figs. 2B, 2D). Body length 1.40 mm. Similar to female. Eyes smaller, labial palpi large. Body with intense metallic green reflections.

Distribution (Figs. 3A, 3B). West Palearctic (Canary Islands, France, Morocco and Spain) (Bouček and Rasplus, 1991; Noyes, 2019), East Palearctic (Iran [New record]).

Biology. The specimens were swept on *Medicago sativa*, *Cynodon dactylon* and *Trifolium resupinatum*.

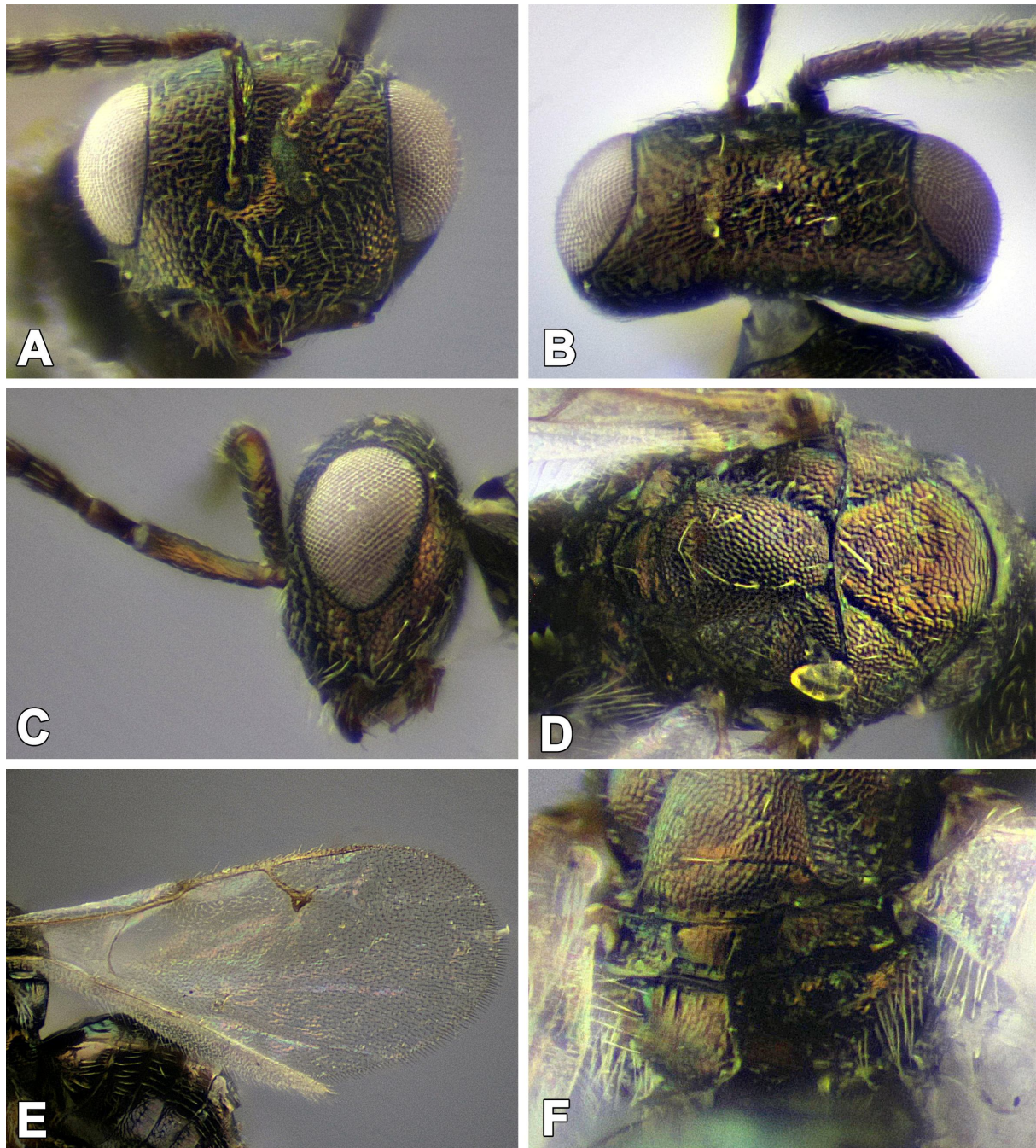


Figure 1 *Harrizia mira* (Delucchi, 1962). **A.** Head, frontal view; **B.** Head, dorsal view, **C.** Head, lateral view; **D.** Mesonotum, notauli and scutellum; **E.** Fore wings; **F.** Propodeum.

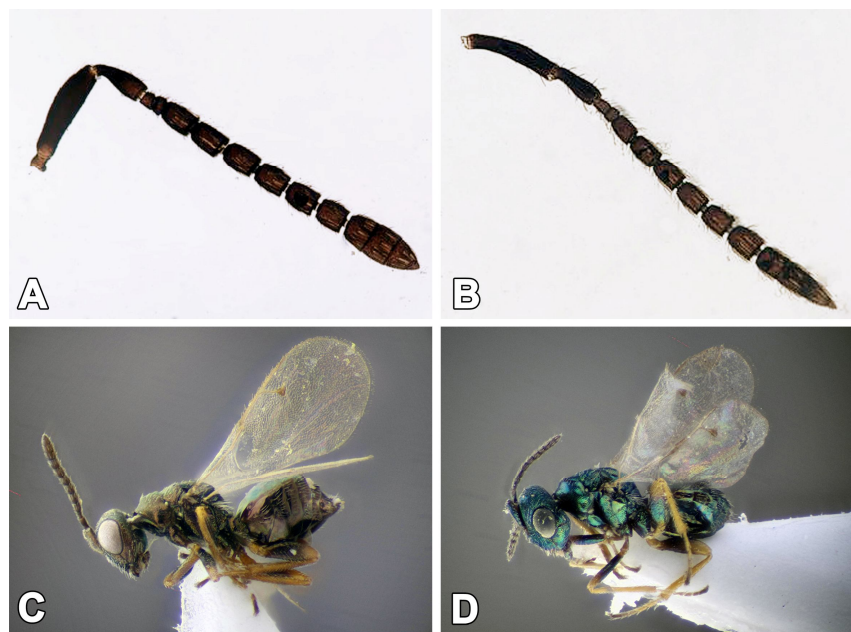


Figure 2 *Harrizia mira* (Delucchi, 1962). A. Antennae, female; B. Antennae, male; C. Adult female; D. Adult male.

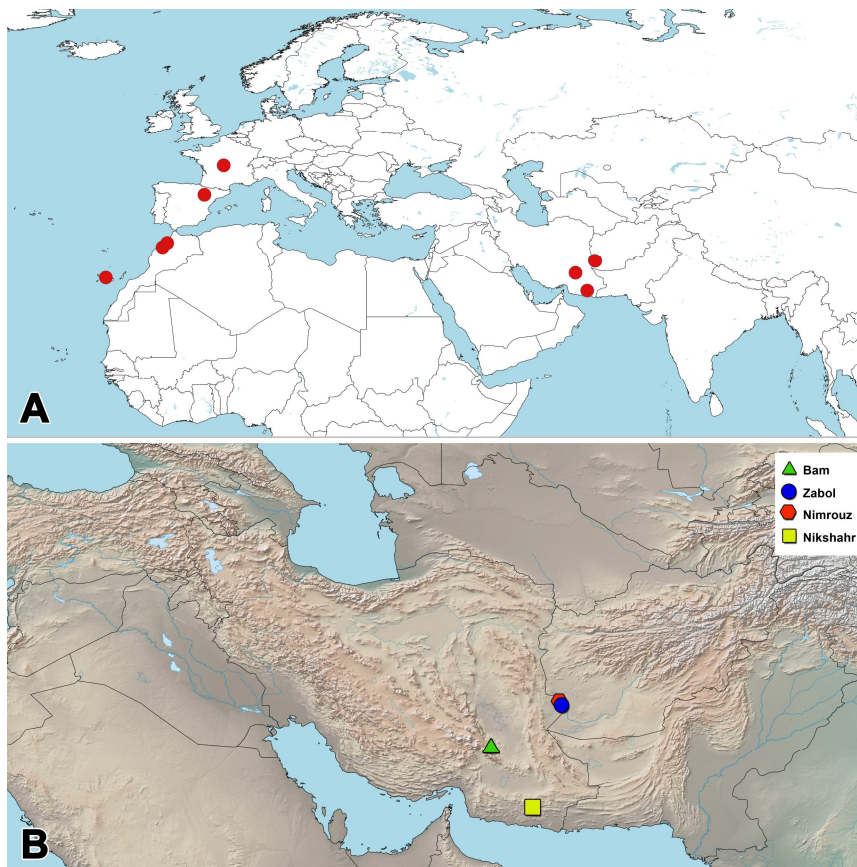


Figure 3 Distribution map of *Harrizia mira* (Delucchi, 1962). A. Palearctic, B. Iran.

Discussion

The genus *Harrizia* with a single species occurred only in south Western Europe (ultimate range of West Palearctic region). The new finding indicated a more expanded area of distribution of this species at the western Asia, located at the border of Eastern and Western Palearctic regions. Based on the result of this study, number of the genera and species of Pteromalidae in Iran raised to 67 and 143, respectively.

The biology of *Harrizia mira* is yet unknown, while Bouček and Rasplus (1991) stated that it is probably a parasitoid of leaf-mining flies (Diptera) on alfalfa. The recent evidence is also indicating occurrence of this species in alfalfa field, being found on clover, as well. Knowledge of the exact host association of *H. mira* is needed in order to justify its discrete distribution along the wide area in which alfalfa is cultivated. The occurrence of *Harrizia* in Iran and its absence in other Asian countries is a matter of question. It can be an accidental introduction into Iran, but lacking the sufficient data makes it impossible to trace the real pattern of its distribution.

Taxonomic status of the genus *Harrizia* has remained unchanged since 1962. Based on the morphological characters (quadrate first anellus, and very short clypeal teeth), it is a good genus among Miscogasterinae, but further studies using both morphological characters and molecular markers are necessary to reveal its phylogenetic position or even possible existence of cryptic species/subspecies.

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References

Abolhassanzadeh, F., Lotfalizadeh, H. and Madjdzadeh, S. M. 2017. Updated checklist of Pteromalidae (Hymenoptera:

Chalcidoidea) of Iran, with some new records. *Journal of Insect Biodiversity and Systematics*, 3 (2): 119-140.

Achterberg, C. van. 2009. Can Townes type Malaise traps be improved some recent developments. *Entomologische Berichten*, 69 (4): 129-135.

Bouček, Z. 1988. Australasian Chalcidoidea (Hymenoptera). A biosystematic revision of genera of fourteen families, with a reclassification of species. CAB International, Wallingford, Oxon, U. K., Cambrian News Ltd; Aberystwyth, Wales.

Bouček, Z. and Rasplus, J. Y. 1991. Illustrated key to West-Palearctic genera of Pteromalidae (Hymenoptera: Chalcidoidea). Institut National de la Recherche Agronomique Paris, 140 pp.

Delucchi, V. 1962. Hyménoptères chalcidiens du Maroc. I. Pteromalidae. *Al Awamia*, 2: 113-135.

Gibson, G. A. 2015. The presence of *Notanisuus* Walker (Hymenoptera: Pteromalidae) in North America and revision of the *oulmesiensis* species group. *Zootaxa*, 3948 (3): 422-450.

Graham, M. W. R. D. V. 1969. The Pteromalidae of North-Western Europe (Hymenoptera: Chalcidoidea). *British Museum, Natural History*, 16: 1-908.

Lotfalizadeh, H., Iranpoor, A. and Mohammadi-Khoramabadi, A. 2019a. First reports of temporally soil-dwelling Chalcidoidea (Hymenoptera). *Biharean Biologist*, 13 (2): 89-93.

Lotfalizadeh, H., Rasplus, J. Y. and Asadi-Farfar, M. 2019b. Review of the genus *Notanisuus* Walker, 1837 (Hymenoptera: Pteromalidae) in Iran. *Journal of Insect Biodiversity and Systematics*, 5 (1): 59-68.

Moravvej, S. A., Lotfalizadeh, H. and Shishehbor, P. 2018. A contribution to the study of Pteromalidae (Hymenoptera: Chalcidoidea) of Khuzestan in southwestern Iran. *Journal of Insect Biodiversity and Systematics*, 4 (2): 91-97.

Noyes, J. S. 2019. Universal Chalcidoidea Database. World Wide Web electronic

- publication. <https://www.nhm.ac.uk/chalcidoids> (accessed 2 August, 2019).
- Rahmani, Z., Rakhshani, E., Lotfalizadeh, H. and Mokhtari, A. 2019a. The genus *Colotrechnus* Thomson, 1878 (Hymenoptera: Pteromalidae) in the North- and South-Eastern provinces of Iran. *Journal of Insect Biodiversity and Systematics*, 5 (3): 211-219.
- Rahmani, Z., Rakhshani, E., Lotfalizadeh, H. and Mokhtari, A. 2019b. Two small genera, *Ischyroptyx* Delucchi and *Novitzkyanus* Bouček (Hymenoptera: Pteromalidae) new to fauna of Iran. *Oriental Insects*, Published online: <https://doi.org/10.1080/00305316.2019.1697767>.
- Rahmani, Z., Samartsev, K., Ghafouri Moghaddam, M. and Rakhshani, E. 2019c. Occurrence of an uncommon genus, *Amyosoma* Viereck (Hymenoptera: Braconidae: Braconinae) in Iran, *Oriental Insects*, Published online: <https://doi.org/10.1080/00305316.2019.1626779>.
- Shojaey, M., Khayrandish, M., Madjdzadeh, S. M. and Lotfalizadeh, H. 2019. First record of *Caenocrepis arenicola* (Thomson, 1878) (Hymenoptera: Pteromalidae) from Iran. *Journal of Insect Biodiversity and Systematics*, 5 (2): 121-126.
- Shorthouse, D. P. 2010. SimpleMappr, an online tool to produce publication-quality point maps. [On Line]. Available from <http://www.simplemappr.net> (accessed 5 August, 2019).
- Zardouei Heydari, M., Rakhshani, E. and 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.

اولین گزارش انتشار جنس *Harrizia* Delucchi, 1962 (Hymenoptera: Pteromalidae) در مرز منطقه شرق پالئارکتیک

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چکیده: انتشار جنس *Harrizia* Delucchi, 1962 براساس گونه *Harrizia mira* Delucchi, 1962 برای اولین بار از ایران در مرز منطقه شرق پالئارکتیک گزارش شد. این جنس هم‌چنین برای اولین بار از قاره آسیا گزارش می‌شود. نمونه‌های مورد بررسی از استان‌های سیستان و بلوچستان و کرمان در جنوب شرق ایران جمع‌آوری شدند. توصیف افتراقی مصور گونه *H. mira* ارایه و پراکنش آن مورد بحث قرار گرفت.

واژگان کلیدی: بال‌غشاییان، کالسیدها، گزارش جدید، آسیا، ایران