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ORIGINAL ARTICLE

FIRST RECORD OF TWO PARASITOID WASPS OF THE FAMILY CHALCIDIDAE (HYMENOPTERA) IN IRAQ

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ABSTRACT

The family Chalcididae (Order: Hymenoptera) is known as one of the large chalcidoid wasps with some distinct morphological characters. The first occurrence of two parasitoid species belonging to this family was reported in the Al-Husayniya district Karbala Province, Iraq; which are: *Brachymeria podagrica* (Fabricius, 1787) and *Chalcis myrifex* (Sulzer, 1776). Both species were collected by using the sweeping net from orchards during July 2020.

Keywords: *Brachymeria*, Chalcididae, *Chalcis*, New record, Karbala, Parasitoid.

INTRODUCTION

The family of Chalcididae (Hymenoptera, Chalcidoidea) is ascetically big and globally distributed, presently containing more than 85 genera and about 1,564 species under five subfamilies (Noyes, 2020; Cruaud *et al.*, 2021). These are parasitic wasps of cocoon of two orders (Lepidoptera and Diptera) species (Delvare, 1995) and are endoparasitoids wasps called host group-specific (Dajoz, 2010) of Diptera species, Coleoptera larvae, Lepidoptera species, and some species of Tenthredinidae family and Neuroptera order (Herting, 1978; Bouček, 1988; Lotfalizadeh *et al.*, 2012). More than 122 hosts insect can be parasitized by twenty-five species of Chalcididae; of these, ninety-eight are Lepidoptera, sixteen Diptera, thirteen Hymenoptera, and four Coleoptera (Ferrer, 2010). Lotfalizadeh and Mohammadi-Khoramabadi (2021) believe that 71% of known species from Iran have unknown biology and the rest are parasitoids of Lepidoptera, Coleoptera and Diptera as the main hosts of the family.

So far, more than six species belonging to three genera of Chalcidoidea have been reported from Iraq (Noyes, 2020). These are *Brachymeria aegyptiaca* Masi, *B. femorata* (Panzer), *B. obtusata* (Foerster), *B. tibialis* (Walker), *Cratocentrus inermus* Delvare and *Kriechbaumerella*

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mansues (Nikolskaya). Therefore, the family Chalcididae is poorly known in Iraq and further samplings are badly needed. Recently, many parasitic wasps novelty reported from Iraq (Al-Zurfi *et al.*, 2020; Kareem *et al.*, 2020 a, b).

The objective of the work is to report the first occurrence of two parasitoids of the family Chalcididae from Iraq.

MATERIALS AND METHODS

The collecting of specimens was done by using the sweeping net from orchards in Al-Husayniya quarter in Karbala city, Iraq in July 2020. These were mounted by insect pin and labelled and primarily identify to high taxa under a stereo microscope at 80x magnifications. The specimens were primarily identified and confirmed by the second author (HL). Identifications were done using the keys in Masi (1951), Steffan (1951, 1959), Bouček and Sedivy (1954), Nikolskaya (1978) and Lotfalizadeh (2012).

The specimens are placed in the Dr. Hossein Lotfalizadeh Lab and the insect collection of the University of Kerbala, Iraq.

RESULTS

The specimens were identified as *Brachymeria podagrica* (Fabricius, 1787) (Pl. 1) and *Chalcis myrifex* (Sulzer, 1776) (Pl. 2)

Brachymeria podagrica (Fabricius, 1787) (Pl. 1)

Synonyms: *Brachymeria aligarhensis* Husain and Agarwal, 1982

- B. alphius* (Walker, 1846)
- B. callipus* (Kirby, 1883)
- B. dipterophaga* (Girault and Dodd, 1915)
- B. eccentrica* (Cameron, 1897)
- B. fonscolombei* (Dufour, 1841)
- B. fonscolombei gananensis* Masi, 1938
- B. fonscolombei nigriflagellatae* Joseph, Narendran and Joy, 1971
- B. fonscolombei rufoflagellatae* Joseph, Narendran and Joy, 1971
- B. mikado* (Cameron, 1888)
- B. neglecta* (Masi, 1916)
- B. podagrica* (Fabricius, 1787)
- B. pulchripes* Holmgren, 1868
- B. restituta* (Walker, 1862)
- B. vulcani* (Schmitz, 1946)
- B. xerxena* (Walker, 1846)
- B. (Brachymeria) fonscolombei* (Dufour, 1841)
- B. (Brachymeria) podagrica* (Fabricius, 1787)
- B. (Brachymeria) restituta* (Walker, 1862)
- B. (Matsumurameria) aligarhensis* Husain and Agarwal, 1982
- Chalcis alphius* Walker, 1846
- Ch. borneanus* Cameron, 1905
- Ch. callipus* Kirby, 1883

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Ch. capensis Cameron, 1905
Ch. dipterophaga Girault and Dodd, 1915
Ch. eccentrica Cameron, 1897
Ch. femorata Nees, 1834
Ch. ferox Kieffer, 1905
Ch. ferox coxalis Kieffer, 1905
Ch. fonscolombei Dufour, 1841
Ch. garutianus Guenther, 1936
Ch. mansueta Walker, 1871
Ch. mikado Cameron, 1888
Ch. neglecta Masi, 1916
Ch. podagrica Fabricius, 1787
Ch. pulchripes (Holmgren, 1868)
Ch. restituta Walker, 1862
Ch. sodalis Masi, 1917
Ch. spilopus Cameron, 1905
Ch. transvaalensis Cameron, 1911
Ch. vegai Girault, 1924
Ch. vulcani Schmitz, 1946
Ch. xerxena Walker, 1846
Tumidicoxoides kurandaensis Girault, 1913
T. paucipunctatus Girault, 1915

Materials examined: Iraq, Karbala Province, Al Husayniya District, Faculty of Agriculture, 32°31'08.00"N 45°36'31.00"E, April. 2020, 2♀.

Measurements: Body length 4.5mm. Based on Masi (1916), its species materials are 4-6mm.

Diagnosis: Such as outlined in Rajabi *et al.* (2011), *B. podagrica* is a rare characteristic species with a red hind femur. This species is identifiable by the following characters: Body mainly black with reddish hind femure, distally whitish, legs with white colours; temple above the postorbital carina densely white pupesent; mesosoma sparsely punctured dorsally; hind femure shiny and sparsely punctured, ventral teeth of femura far apart, with black points; metasoma of female shorter than *B. parvula* (Walker, 1834).

Host: Unknown in Iraq, but it was reported as a parasitoid of different families of Diptera (Calliphoridae, Muscidae, Sarcophagidae, Tephritidae) and Lepidoptera (Lymantriidae, Noctuidae, Psychidae, Yponomeutidae) (Noyes, 2020).

Note: Based on the available literature and personal communication with the Iraq Natural History Research Center and Museum, University of Baghdad (INHM), this species has not been reported from Iraq. But it commonly occurs in the Afrotropical, Palaearctic, Oriental and Nearctic areas (Noyes, 2020).

Chalcis myrifex (Sulzer, 1776) (Pl. 2)

Synonyms: *Chalcis myrifex* (Sulzer, 1776)

Smicra myrifex (Sulzer, 1776)

Smiera petiolata Curtis, 1833

Sphex myrifex Sulzer, 1776

Vespa dearticulata Fourcroy, 1785

Materials examined: Iraq, Karbala Province, Al Husayniya District, 32°31'08.00"N 45°36'31.00"E, April. 2020, 2♀.

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Measurements: Body length 5 mm.

Diagnosis: body dark with following yellowish areas: petiole, tegulae, face with two spots in the lateral parts of antennal scrobe, fore and mid tibiae distally, hind femur in Apical half with a large spot; scape cylindrical, slightly thickened distally; ovipositor cover by last sternite; hind femur with 15 equal teeth, basal dent of the hind femur extremely large.

Host: Unknown in Iraq but *C. myrifex* is known as a parasitoid of *Stratiomys longicornis* (Scopoli, 1763) (Diptera: Stratiomyidae) (Michael, 2008).

Note: Based on available literature and personal contact with the (INHM), this species has not been reported from Iraq. It is reported from the Palearctic region (Bouček, 1952; Bouček, 1977; Kissayi *et al.*, 2019).



Plate (1): Female of *B. podagrica*; (A) Lateral view, (B) Dorsal view. (Red arrow represented important diagnostic characters of this species).

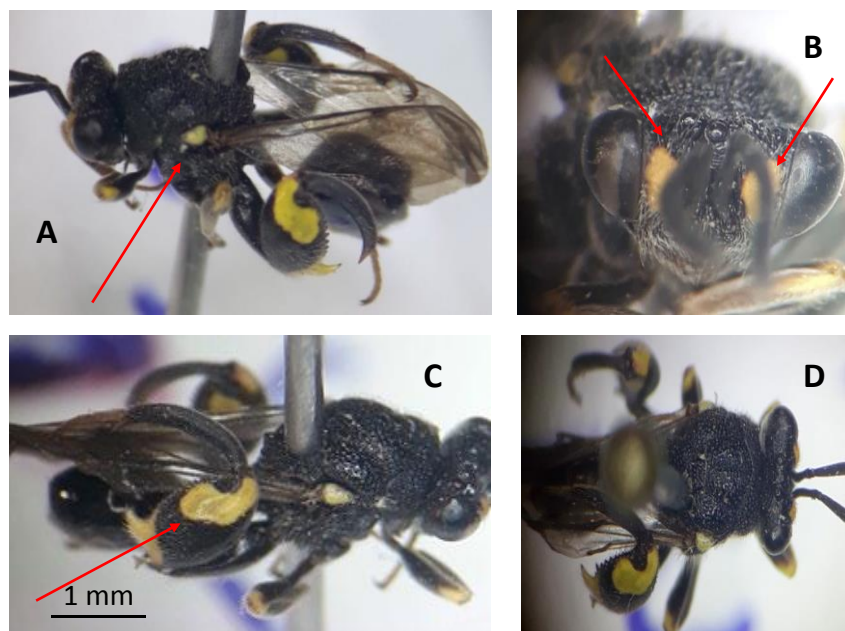
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Plate (2): Female of *C. myrifex*; (A) Lateral view, (B) Head frontal view, (C) Lateral view, (D) Dorsal view of *C. myrifex*. (Red arrow represented important diagnostic characters of this species).

DISCUSSION

Our findings showed two new records of the Chalcididae female species occurring in Iraq. Including these two species recorded in this study, Chalcididae species in Iraq reaches eight. The male was not recorded in the area of study due to the type of traps that were used. Therefore, more survey is needed to find male of these species. The first record species of this family in Iraq was *Brachymeria obtusata* (Foerster, 1859) (Bouček, 1952). Many studies reported species of Chalcididae from the Middle East region including about 74 species from the UAE (Delvare, 2017) and 68 species from Iran (Lotfalizadeh *et al.*, 2012; Falahatpisheh *et al.*, 2018).

Brachymeria podagrica was known from Iran (Rajabi *et al.*, 2011) and was recently informed from Saudi Arabia (Abd Al Galil *et al.*, 2022). *Chalcis myrifex* was not reported from the Middle East and this is the first finding of the species in this area (Lotfalizadeh *et al.*, 2012; Falahatpisheh *et al.*, 2018). Iraq as a big country, with diverse bioclimatic conditions, is expected to have more genera and species of the family. Therefore, future expeditions to collect further species can be advised.

CONCLUSIONS

This study reported for the first time two species belongs to Chalcididae, therefore this results will update the checklist of parasitoids wasps in Iraq. That can improve understanding of the diversity of bioagents and possibly use it in biological control agents the pests.

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CONFLICT OF INTERESTS STATEMENT

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

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السجل الأول لنوعين من الزنابير الطفيلية لعائلة CHALCIDIDAE
(HYMENOPTERA) في العراق

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الخلاصة

تُعرف عائلة Chalcididae (Order, Hymenoptera) بأنها واحدة من الزنابير الكالسيدويد الكبيرة مع بعض الصفات المظهرية المتميزة. تم تسجيل أول ظهور لنوعين من الطفيليات ينتميان إلى هذه العائلة في منطقة الحسينية بمحافظة كربلاء، العراق: *Brachymeria podagrica* (Fabricius, 1787) و *Chalcis myrifex* (Sulzer, 1776).
جُمع كلا النوعين باستخدام الشبكة الكانسة من البساتين خلال شهر تموز 2020.