



Received:
30 June, 2016

Accepted:
13 July, 2016

Published:
13 July, 2016

Subject Editor:
George Japoshvili

Fauna of chalcid wasps (Hymenoptera: Chalcidoidea, Chalcididae) in Hormozgan province, southern Iran

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ABSTRACT. This paper provides data on distribution of 13 chalcid wasp species (Hymenoptera: Chalcidoidea: Chalcididae) belonging to 9 genera and three subfamilies Chalcidinae, Dirhininae and Haltichellinae from Hormozgan province, southern Iran. All collected species are new records for the province. Two species *Dirhinus excavatus* Dalman, 1818 and *Hockeria bifasciata* Walker, 1834 are recorded from Iran for the first time. In the present study, *D. excavatus* is a new species record for the Palaearctic region. An updated list of all known species of Chalcididae from Iran is also included.

Key words: Chalcididae, Hymenoptera, Iran, Fauna, Distribution, Malaise trap

Citation: Tavakoli Roodi, T., Fallahzadeh, M. and Lotfalizadeh, H. 2016. Fauna of chalcid wasps (Hymenoptera: Chalcidoidea: Chalcididae) in Hormozgan province, southern Iran. *Journal of Insect Biodiversity and Systematics*, 2(1): 155–166.

Introduction

The Chalcididae are a moderately specious family of parasitic wasps, with over 1469 nominal species in about 90 genera, occur worldwide but mainly in the tropics (Aguiar *et al.* 2013). In the Palaearctic region, there are more than 262 described species under 34 genera (Noyes 2016). Members of this family have a very diverse biology. Some species are internal and external primary parasitoids while several species are hyperparasitoids on a wide range of other insects (Habu 1960; Narendran 1986; Fry 1989; Delvare and Bouček 1992; Noyes 2016). The host range of the chalcidid wasps is diverse and consist of species classified at least six insect orders: Lepidoptera, Diptera, Hymenoptera,

Coleoptera, Neuroptera and Strepsiptera (Bouček 1952; Narendran 1986; Delvare and Bouček 1992; Noyes 2016).

The first information on Chalcididae from Iran was published by Masi (1924), who described two new species. In the following years, only a few species of this family were reported from the country (Bouček 1952, 1956, Nikol'skaya 1952, 1960). Recently, Delvare *et al.* (2011) described three new species from Iran. Later, Rajabi *et al.* (2011) and Lotfalizadeh *et al.* (2012) provided new information on the Iranian chalcidid fauna together with new data on the hosts of the Chalcididae. Furthermore, Kazemi and Lotfalizadeh (2014), Lotfalizadeh (2014), Lotfalizadeh

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and Jafari-Nadushan (2015) and Moravvej *et al.* (2016) added some new records from Iran. However, the chalcids fauna of Iran is still poorly studied.

According to the literature, no Chalcididae have been recorded from Hormozgan province. The aim of present study was to increase of our knowledge regarding Iranian chalcid wasps of the family Chalcididae from southern Iran.

Material and methods

The specimens were collected using five standard Malaise traps in different locations in Hormozgan province, Iran during year 2013. Hormozgan province covers the surface of about 70,697 km², is located in the in the south of Iran and border of Persian Gulf. The province is primarily mountainous, consisting of the southern tip of the Zagros mountain range. Hormozgan has a tropical humid climate, with summer temperatures very frequently above 49°C. There is very little precipitation year round.

The identifications were mainly carried out using available keys (Masi 1924, 1929a,b, 1932, Nikol'skaya 1952, Bouček 1952, 1956, 1988, Habu 1960, Steffan 1976, Bouček and Narendran 1981). The photographs were taken using a Nikon 990 camera mounted on a Nikon SMZ-2T stereomicroscope, and were processed using Adobe Photoshop.

The voucher specimens are deposited in Department of Entomology, Jahrom Branch, Islamic Azad University, Jahrom, Iran (JIAU) and Department of Plant Protection, Agricultural and Natural Resources Research of East-Azarbaijan province, Tabriz. The taxonomy and distributional data were adapted from Noyes (2016).

Results

In the present study, a total of 36 specimens from 13 species in nine genera and three subfamilies Chalcidinae, Dirhininae and

Haltichellinae are recorded from Hormozgan province, southern Iran. The subfamilies, genera and species are listed in alphabetic order.

Chalcididae: Chalcidinae

Genus *Brachymeria* Westwood, 1829

Brachymeria podagrica (Fabricius, 1787)

Material examined: 1♀, Hormozgan province, Roodan (Band e Mola), 27°24'N, 57°09'E, 16.vi.2013, in Lime garden, leg. T. Tavakoli; 1♀, Hormozgan province, Roodan (SarKahnan), 27°25'N, 57°07'E, 09.vii.2013, in mixed Lime and Mango garden, leg. T. Tavakoli; 1♀, 18.vii.2013, same data

General distribution: Cosmopolitan (Noyes 2016).

Comments: *Brachymeria* is a worldwide, large genus contains about 308 described species (Noyes 2016) with many parasitoid species of Lepidoptera which are often important pest on various fruit and forest trees and other economic important trees (Burks 1960; Delvare *et al.* 2011). Recently, *Brachymeria ceratoniae* Delvare, 2011 was described as parasitoid of *Apomyelois ceratoniae* (Lepidoptera: Pyralidae), the economic important pest of carob tree, *Ceratonia siliqua* (Fabaceae) from Iran (Delvare *et al.* 2011). In Iran, *B. podagrica* was already collected by sweep net on Fabaceae in Kerman province (Rajabi *et al.* 2011).

Genus *Chalcis* Fabricius, 1787

Chalcis sispes (Linnaeus, 1761)

Material examined: 1♀, Hormozgan province, Roodan (SarKahnan), 27°25'N, 57°07'E, 04.vi.2013, in mixed Lime and Mango garden, leg. T. Tavakoli; 1♀, 16.vi.2013, same data; 1♂, Hormozgan province, Roodan (Band e Mola), 27°25'N, 57°09'E, 16.vi.2013, in Lime garden, leg. T. Tavakoli.

General distribution: Palaearctic (Noyes, 2016).

Comments: The genus *Chalcis* includes more than 60 known species that only 13 species have been reported from Palaearctic region (Noyes 2016). Within *Chalcis*, only two species, *C. biguttata* Spinola, 1808 and *C. sispes* have hitherto been reported from Iran (Lotfalizadeh *et al.* 2012). *Chalcis sispes* is a primary parasitoid of some species of Stratiomyidae (Diptera: Stratiomyomopha) (Noyes 2016).

Chalcididae: Dirhininae

Genus *Dirhinus* Dalman, 1818

Dirhinus excavatus Dalman, 1818

Material examined: 1♀, Hormozgan province, Roodan (SarKahnan), 27°25'N, 57°07'E, 18.vii.2013, in mixed Lime and Mango garden, leg. T. Tavakoli

General distribution: Afrotropical (Eritrea, Kenya, Senegal, Sierra Leone), Oriental (India) (Noyes, 2016). New for the Iranian fauna.

Comments: The genus *Dirhinus* is a moderate and cosmopolitan genus of the tribe Dirhinini that currently consists of over 62 nominal species (Bouček and Narendran 1981; Noyes 2016). Bouček and Narendran (1981) reviewed and revised Indian species of this genus. The majority of species appears to be associated with dipteran families (Habu 1960; Noyes 2016).

Dirhinus excavatus is considered a primary parasitoid of *Stomorphina lunata* (Diptera: Calliphoridae), *Pyrausta machaeralis* and *Sylepta derogata* (Lepidoptera: Pyralidae) and *Hersecon volvuli* (Lepidoptera: Sphingidae) (see Noyes 2016). It was already reported as hyperparasitoid of *Drino solennis* and *Sturmiopsis parasitica* (Diptera: Tachinidae) and *Phanerotoma hendecasisella* (Hymenoptera: Braconidae) (Noyes 2016).

It can be distinguished from other species of the genus by the following combination of characters: Peduncle in female twice than long; first tergite with about 15 furrows

evidently longer than petiole, minutely punctate on dorsum, setae on head and on dorsum of thorax brass-yellow; wings hardly with tined greyish yellow (Husain and Agarwal 1981) (Figs.1–4).

Until now, the *Dirhinus* species recorded from Iran were *D. bakeri* (Crawford, 1914); *D. hesperidum* (Rossi, 1790); *D. himalayanus* Westwood, 1836 and *D. wohlfahrtiae* Ferrière, 1935 (Rajabiet *al.* 2011; Lotfalizadeh *et al.* 2012; Moravvej *et al.* 2016).

Chalcididae: Haltichellinae

Genus *Antrocephalus* Kirby, 1883

Antrocephalus hypsopygiae Masi, 1928

Material examined: 1♀, Hormozgan province, Roodan (SarKahnan), 27°25'N, 57°07'E, 08.vi.2013, in mixed Lime and Mango garden, leg. T. Tavakoli; 1♂, Hormozgan province, Roodan (Band e Mola), 27°25'N, 57°09'E, 16.vi.2013, in Lime garden, leg. T. Tavakoli; 1♂, 24.vi.2013, same data, 1♀, Hormozgan province, Roodan (SarKahnan), 27°24'N, 57°07'E, 26.vi.2013, in mixed Lime and Mango garden, leg. T. Tavakoli.

General distribution: Palaearctic (Lotfalizadeh *et al.* 2012; Noyes 2016)

Comments: The genus *Antrocephalus* with more than 120 described species that most species are distributed in Palaearctic. The main hosts are moth families such as Tortricidae, Pyralidae and Crambidae (Noyes 2016).

In Iran, *Antrocephalus hypsopygiae* is known from Kerman province (south-eastern Iran) and in a rice field infested by *Chilo suppressalis* Walker (Lepidoptera: Crambidae) and *Naranga aenescens* Moore (Lepidoptera: Noctuidae) from border of Caspian Sea in the North of Iran (Lotfalizadeh *et al.* 2012). This species has recently been recorded from East-Azarbaijan province, northwestern Iran (Lotfalizadeh 2014).



Figures 1–4. *Dirhinus excavatus* Dalman, 1818: 1. Female in lateral view, 2. Antenna; 3. Mesosoma in dorsal view, 4. Leg and gaster in lateral view.

Genus *Hockeria* Walker, 1834

***Hockeria bifasciata* Walker, 1834**

Material examined: 1♀, Hormozgan province, Roodan (Poshteh), 27°26'N, 57°09'E, 04.iv.2013, in mixed Lime and Mango garden, leg. T. Tavakoli

General distribution: Palaearctic (Noyes 2016). New for the Iranian fauna.

Comments: *Hockeria* has a worldwide distribution, with 106 known species, that currently 33 species reported from the Palaearctic region (Noyes 2016). A number of regional keys to species of *Hockeria* have been published: for central Asia (Nikol'skaya 1952, 1960), Europe (Bouček 1982) and Oriental (Narendran 1989). *Hockeria bifasciata* can be distinguished from other Palaearctic species by the following combination of characters: Abdomen shorter than total

length of thorax and head; Carina on last abdominal tergite almost 1.5 times longer than distance between pygostyles; Forewings with light-colored apex, colorless base, and two colorless spots; Body length 2.0 to 5.0 mm (Nikol'skaya 1952) (Fig. 5–8).

Species of *Hockeria* are normally primary parasitoids of Lepidoptera (Narendran, 1989), although some species attack members of Hymenoptera, Strepsiptera, Diptera and Neuroptera (Halstead 1990).

***Hockeria unicolor* Walker, 1834**

Material examined: 1♂, Hormozgan province, Roodan (SarKahnan), 27°25'N, 57°07'E, 18.vii.2013, in mixed Lime and Mango garden, leg. T. Tavakoli; 1♀, Hormozgan province, Roodan (Poshteh), 27°26'N, 57°09'E, 04.vi.2013, in mixed Lime and Mango garden, leg. T. Tavakoli



Figures 5–8. *Hockeria bifasciata* Walker, 1834: 5. Female in lateral view, 6. Antenna, 7. Forewing, 8. Mesosoma in dorsal view.

General distribution: Afrotropical region, Palaearctic (Noyes 2016).

Comments: *Hockeria unicolor* is a polyphagous parasitoid of several families of microlepidoptera (Lotfalizadeh *et al.* 2012; Lotfalizadeh 2014; Noyes 2016).

Genus *Lasiochalcidia* Masi, 1929

***Lasiochalcidia cincticornis* (Walker, 1871)**

Material examined: 1♀, Hormozgan province, Roodan (SarKahnan), 27°25'N, 57°07'E, 04.vi.2013, in mixed Lime and Mango garden, leg. T. Tavakoli

General distribution: Palaearctic (Noyes, 2016).

Comments: The genus *Lasiochalcidia* contains 22 described species that are the

best-known parasitoids of ant lions (Steffan 1961, 1966; Noyes 2016), and another host reports are very doubtful (Lotfalizadeh *et al.* 2012). *Lasiochalcidia cincticornis* has already been reported from Sistan-Baluchestan and East-Azarbaijan provinces (Lotfalizadeh *et al.* 2012; Lotfalizadeh 2014).

***Lasiochalcidia dargelasii* (Latreille, 1805)**

Material examined: 1♂, Hormozgan province, Roodan (SarKahnan), 27°24'N, 57°07'E, 04.vi.2013, in mixed Lime and Mango garden, leg. T. Tavakoli; 1♂, 1♀, 25.vi.2013, same data; 1♂, Hormozgan province, Roodan (Band e Mola), 27°25'N, 57°09'E, 08.vi.2013, in Lime garden, leg. T. Tavakoli; 1♀, 16.vi.2013, same data

General distribution: Palaearctic, Oriental (Noyes 2016).

Comments: *Lasiochalcidia dargelasii* has previously been reported from Plum garden in Kerman province, southeastern Iran (Rajabiet *et al.* 2011).

***Lasiochalcidia indescrita* Bouček, 1952**

Material examined: 1♀, Hormozgan province, Roodan (SarKahnan), 27°25'N, 57°07'E, 08.vi.2013, in mixed Lime and Mango garden, leg. T. Tavakoli

General distribution: Europe (Bouček 1952; Noyes 2016).

Comments: It has hitherto been reported from northern Iran (Lotfalizadeh *et al.* 2012). The record of this species from southern Iran shows the wider distribution of this species in the Iranian plateau

***Lasiochalcidia pubescens* (Klug, 1834)**

Material examined: 1♂, Hormozgan province, Roodan (SarKahnan), 27°24'N, 57°07'E, 04.vi.2013, in mixed Lime and Mango garden, leg. T. Tavakoli;

General distribution: West Palaearctic (Noyes 2016).

Comments: It has hitherto been reported from orange orchard in Kerman province, southeastern Iran (Rajabi *et al.* 2011).

Genus *Neochalcis* Kirby, 1883

***Neochalcis fertoni* (Kieffer, 1899)**

Material examined: 1♂, Hormozgan province, Roodan (Band e Mola), 27°25'N, 57°09'E, 24.vi.2013, in Lime garden, leg. T. Tavakoli; 1♂, Hormozgan province, Roodan (SarKahnan), 27°24'N, 57°07'E, 25.vi.2013, in mixed Lime and Mango garden, leg. T. Tavakoli

General distribution: Palaearctic (Noyes 2016).

Comments: The genus *Neochalcis* contains 10 described species that most species distributed in Central Asia and Europe (Nikol'skaya 1960; Noyes 2016). So far, only

one species *Neochalcis fertoni* has been reported from northwestern Iran (Lotfalizadeh *et al.* 2012). The presence of *N. fertoni* in southern Iran indicates the wider distribution of this species in the Iranian plateau.

Genus *Proconura* Dodd, 1915

***Proconura nigripes* (Fonscolombe, 1832)**

Material examined: 1♀, Hormozgan province, Roodan (Band e Mola), 27°25'N, 57°09'E, 16.vi.2013, in Lime garden, leg. T. Tavakoli

General distribution: Palaearctic (Noyes 2016).

Comments: *Proconura* is an old world genus with approximately more than 30 known species. This genus has very different hosts from various orders of insects such as Lepidoptera, Diptera, Hymenoptera and Coleoptera (Noyes 2016). It is exactly diversified in the arid regions around the Mediterranean Basin however present also in the Oriental, Australasian and Afrotropical regions (Delvere *et al.* 2011).

Proconura nigripes has already been reported as parasitoid of several species of moths from families Gelechiidae, Pyralidae and Yponomeutidae (Bouček 1966; Noyes 2016). In Iran, it was reared from *Schneidereria pistaciicola* (Danilewski, 1955) (Lepidoptera: Gelechiidae) (Davatchi 1958).

Genus *Psilochalcis* Kieffer, 1905

***Psilochalcis ligustica* (Masi, 1929)**

Material examined: 1♀, Hormozgan province, Roodan (SarKahnan), 27°25'N, 57°07'E, 18.vii.2013, in mixed Lime and Mango garden, leg. T. Tavakoli

General distribution: Palaearctic, Oriental (Noyes 2016).

Comments: The genus *Psilochalcis* with about 55 species is well represented in the Palaearctic region from where most of the known species have been recorded. Most well-known hosts of this genus are Lepidoptera and especially from two families Pyralidae and Crambidae (Noyes 2016).

Table 1. List of the Chalcididae (Hymenoptera: Chalcidoidea) known from Iran.

Subfamily	Genera and species	References
I. Chalcidinae		
	Genus <i>Brachymeria</i> Westwood, 1829	
	<i>B. albicrus</i> (Klug, 1834)	Hasanshahi <i>et al.</i> (2013)
	<i>B. argenteopilosa</i> (Radoszkowski, 1876)	Rajabi <i>et al.</i> (2011)
	<i>B. ceratoniae</i> Delvare, 2011	Delvare <i>et al.</i> (2011)
	<i>B. excarinata</i> Gahan, 1925	Lotfalizadeh <i>et al.</i> (2012)
	<i>B. femorata</i> (Panzer, 1801)	Lotfalizadeh <i>et al.</i> (2012)
	<i>B. hibernalis</i> Askew, 1991	Lotfalizadeh (2012)
	<i>B. lasus</i> (Walker, 1841)	Lotfalizadeh <i>et al.</i> (2012)
	<i>B. moerens</i> (Ruschka, 1922)	Ghahari <i>et al.</i> (2016)
	<i>B. minuta</i> (Linnaeus, 1767)	Lotfalizadeh <i>et al.</i> (2012)
	<i>B. obtusata</i> (Förster, 1859)	Lotfalizadeh <i>et al.</i> (2012)
	<i>B. parvula</i> (Walker, 1834)	Rajabi <i>et al.</i> (2011)
	<i>B. persica</i> (Masi, 1924)	Lotfalizadeh <i>et al.</i> (2012)
	<i>B. podagrica</i> (Fabricius, 1787)	Rajabiet <i>al.</i> (2011)
	<i>B. rufigaster</i> (Masi, 1924)	Lotfalizadeh <i>et al.</i> (2012)
	<i>B. rugulosa</i> (Förster, 1859)	Lotfalizadeh <i>et al.</i> (2012)
	<i>B. secundaria</i> (Ruschka, 1922)	Lotfalizadeh (2013)
	<i>B. tibialis</i> (Walker, 1834)	Lotfalizadeh <i>et al.</i> (2012)
	<i>B. vitripennis</i> (Förster, 1859)	Lotfalizadeh <i>et al.</i> (2012)
	Genus <i>Chalcis</i> Fabricius, 1787	
	<i>C. biguttata</i> Spinola, 1808	Lotfalizadeh <i>et al.</i> (2012)
	<i>C. sispes</i> (Linnaeus, 1761)	Lotfalizadeh <i>et al.</i> (2012)
	Genus <i>Cratocentrus</i> Cameron, 1907	
	<i>C. tomentosus</i> (Nikol'skaya, 1952)	Lotfalizadeh <i>et al.</i> (2012)
	Genus <i>Trigonura</i> Sichel, 1866	
	<i>T. ninae</i> (Nikol'skaya, 1952)	Lotfalizadeh <i>et al.</i> (2012)
	<i>T. ruficaudis</i> (Cameron, 1913)	Lotfalizadeh and Khalghani (2008)
II- Dirhininae		
	Genus <i>Dirhinus</i> Dalman, 1818	
	<i>D. bakeri</i> (Crawford, 1914)	Moravvej <i>et al.</i> (2016)
	<i>D. excavates</i> Dalman, 1818	Current study
	<i>D. hesperidum</i> (Rossi, 1790)	Rajabi <i>et al.</i> (2011)
	<i>D. himalayanus</i> Westwood, 1836	Lotfalizadeh <i>et al.</i> (2012)
	<i>D. wohlfahrtiae</i> Ferrière, 1935	Lotfalizadeh <i>et al.</i> (2012)
III- Haltichellinae		
	Genus <i>Antrocephalus</i> Kirby, 1883	
	<i>A. hypsopygiae</i> Masi, 1928	Lotfalizadeh <i>et al.</i> (2012)
	Genus <i>Belaspidia</i> Masi, 1916	
	<i>B. obscura</i> Masi, 1916	Lotfalizadeh <i>et al.</i> (2012)
	<i>B. nigra</i> (Siebold, 1856)	Lotfalizadeh <i>et al.</i> (2012)
	Genus <i>Haltichella</i> Spinola, 1811	
	<i>H. rufipes</i> (Olivier, 1791)	Rajabi <i>et al.</i> (2011)
	Genus <i>Hockeria</i> Walker, 1834	
	<i>H. bifasciata</i> Walker, 1834	Current study

Table 1. Continued

<i>H. confusa</i> Nikol'skaya, 1960	Lotfalizadeh <i>et al.</i> (2012)
<i>H. magna</i> Bouček, 1952	Kazemi and Lotfalizadeh (2014)
<i>H. singularis</i> Bouček, 1952	Lotfalizadeh (2014)
<i>H. susterai</i> Bouček, 1952	Rajabi <i>et al.</i> (2011)
<i>H. unicolor</i> Walker, 1834	Lotfalizadeh <i>et al.</i> (2012)
Genus <i>Kriechbaumerella</i> Dalla Torre, 1897	
<i>K. gracilis</i> (Nicol'skaya, 1952)	Lotfalizadeh <i>et al.</i> (2012)
<i>K. hofferi</i> (Bouček, 1952)	Lotfalizadeh <i>et al.</i> (2012)
Genus <i>Lasiochalcidia</i> Masi, 1929	
<i>L. cincticornis</i> (Walker, 1871)	Lotfalizadeh <i>et al.</i> (2012)
<i>L. dargelasii</i> (Latreille, 1805)	Rajabi <i>et al.</i> (2011)
<i>L. indscripta</i> Bouček, 1952	Lotfalizadeh <i>et al.</i> (2012)
<i>L. pubescens</i> (Klug, 1834)	Rajabi <i>et al.</i> (2011)
<i>L. sparsibarbis</i> Bouček, 1956	Lotfalizadeh <i>et al.</i> (2012)
Genus <i>Neochalcis</i> Kirby, 1883	
<i>N. fertoni</i> (Kieffer, 1899)	Lotfalizadeh <i>et al.</i> (2012)
Genus <i>Neohybothorax</i> Nikol'skaya, 1960	
<i>N. hetera</i> (Walker, 1834)	Lotfalizadeh <i>et al.</i> (2012)
Genus <i>Proconura</i> Dodd, 1915	
<i>P. barbara</i> (Masi, 1929)	Lotfalizadeh (2014)
<i>P. caryobori</i> (Hanna, 1934)	Lotfalizadeh <i>et al.</i> (2012)
<i>P. incongruens</i> (Masi, 1932)	Lotfalizadeh <i>et al.</i> (2012)
<i>P. nigripes</i> (Fonscolombe, 1832)	Lotfalizadeh <i>et al.</i> (2012)
<i>P. persica</i> Delvare, 2011	Delvare <i>et al.</i> (2011)
Genus <i>Psilochalcis</i> Kieffer, 1905	
<i>P. benoisti</i> (Steffan, 1948)	Rajabi <i>et al.</i> (2011)
<i>P. ceratoniae</i> Delvare, 2011	Delvare <i>et al.</i> (2011)
<i>P. ligustica</i> (Masi, 1929)	Lotfalizadeh <i>et al.</i> (2012)
<i>P. nigerrima</i> (Masi, 1929)	Rajabi <i>et al.</i> (2011)
<i>P. subaenea</i> (Masi, 1929)	Lotfalizadeh <i>et al.</i> (2012)
<i>P. subarmata</i> (Förster, 1855)	Rajabi <i>et al.</i> (2011)
<i>P. subjecta</i> (Nicol'skaya, 1960)	Lotfalizadeh <i>et al.</i> (2012)
<i>P. zarudnyi</i> (Nicol'skaya, 1960)	Lotfalizadeh <i>et al.</i> (2012)
Genus <i>Tanycoryphus</i> Cameron, 1905	
<i>T. tibialis</i> (Nicol'skaya, 1960)	Lotfalizadeh <i>et al.</i> (2012)

Psilochalcis ligustica is widely distributed in Palaearctic and Oriental regions (Narendran 1989). In Iran, it has hitherto been reported from Ilam and Qazvin provinces (Lotfalizadeh *et al.* 2012).

Discussion

Although chalcid wasps are one of the most important groups of insect crop pest parasitoids and have great economic importance (Delvare *et al.* 2011), surprisingly have received little attention in Iran.

Up to now, near to 61 species and 16 genera from three subfamilies Chalcidinae (four genera and 23 species), Dirhininae (one genus and five species) and Haltichellinae (11 genera and 33 species) have been reported from Iran (Table 1) while more than 262 species in 34 genera were recorded from Palaearctic (Noyes 2016). In fact, the chalcidid fauna of Iran is still poorly known. Two subfamilies, Epitraninae and Smicromorphinae, have not been observed in Iran. Before our

study, no chalcidid wasps have been recorded from Hormozgan, although this area is very interesting and it is possible presence elements of the Oriental, Afro-tropical, and Palaearctic regions.

In the current work, *Dirhinus excavatus* is recorded for the first time from Palaearctic region. Prior to our study, only 11 species of this genus have been recorded from this region (Noyes 2016). Moreover, two species *Dirhinus excavatus* and *Hockeria bifasciata* are recorded from Iran for the first time. In addition, all collected species are reported for the first time from Hormozgan province. Because the specimens were collected using Malaise traps, so their biology and host(s) were remain unknown. In addition to faunistic studies, further investigations on the biology of chalcids wasps in Iran are recommended.

Acknowledgments

The research was supported by Islamic Azad University, Jahrom Branch, Jahrom, Iran and Department of Plant Protection, East-Azərbayjan Agricultural and Natural Resources Research & Education Center, Agricultural Research, Education and Extension Organization (AREEO), Tabriz, Iran. We cordially thank three anonymous reviewers for their valuable comments and recommendations in the earlier version of this paper.

References

- Aguiar, A., Deans, A., Engel, M., Forshage, M., Huber, J., Jennings, J., Johnson, N., Lelej, A., Longino, J., Lohrman, V., Mikó, I., Ohl, M., Ramussen, C., Taeger, A. and Ki Yu, D. 2013. Order Hymenoptera, pp. 51–62. In: Zhang, Z.Q. (Ed.), *Animal Biodiversity: An Outline of Higher-level Classification and Survey of Taxonomic Richness*, Addenda. *Zootaxa*, 3703: 1–82.
- Bouček, Z. 1952. The first revision of the European species of the family Chalcididae (Hymenoptera). *Acta Entomologica Musei Nationalis Pragae*, 27 (supplement 1): 1–108, pl. i–xvii.
- Bouček, Z. 1956. A contribution to the knowledge of the Chalcididae, Leucospidae and Eucharitidae (Hymenoptera, Chalcidoidea) of the Near East. *Bulletin of the Research Council of Israel*, 5B: 227–259.
- Bouček, Z. 1966. Materialy po faune chalcid (Hymenoptera, Chalcidoidea) Moldavskoy SSR. 2. *Trudy Moldavskogo Nauchno-Issledovatel'skogo Instituta Sadovodstva, Vinogradarstvoi Vinodeliya. Kishinev*, 13: 15–38.
- Bouček, Z. 1982. Description of a new *Hockeria* (Hymenoptera: Chalcidoidea), a parasite of a lepidopterous gall-causer on Tamarix. *Israel Journal of Entomology*, 16: 49–51.
- Bouček, Z. 1988. *Australasian Chalcidoidea (Hymenoptera). A biosystematic revision of genera of fourteen families, with a reclassification of species*. CAB International, Wallingford, Oxford, UK. 832 pp.
- Bouček, Z. and Narendran, T.C. 1981. Indian chalcid wasps (Hymenoptera) of the genus *Dirhinus* parasitic on synanthropic and other Diptera. *Systematic Entomology*, 6: 229–251.
- Burks, B.D. 1960. A revision of the genus *Brachymeria* Westwood in America north of Mexico (Hymenoptera: Chalcididae). *Transactions of the American Entomological Society*, 86(3): 225–273.
- Davatchi, A. 1958. Étude biologique de la faune entomologique des *Pistacia* sauvages et cultivés. *Revue de Pathologie Végétale et d'Entomologie Agricole*, 37: 1–166.
- Delvare, G. and Bouček, Z. 1992. On the New World Chalcididae (Hymenoptera). *Memoirs of the American Entomological Institute*, 53: 1–466.
- Delvare, G., Talaei, L. and Goldansaz S. H. 2011. New Chalcididae (Hymenoptera: Chalcidoidea) of economic importance from Iran. *Annales Zoologici (Warszawa)*, 61(4): 789–801.
- Fry, J. M. 1989. *Natural enemy databank, 1987. A catalogue of natural enemies of arthropods derived from records in the CIBC Natural Enemy Databank*. CAB International, Wallingford, Oxford, UK. 97 pp.
- Ghahari, H., Myartseva, S.N. and Ruíz-Cancino, E. 2013. A faunistic study on some families

- of Chalcidoidea from Golestan province and vicinity, northern Iran. *Folia Entomologica Mexicana (nuevaserie)*, 2(1): 10–15.
- Habu, A. 1960. A revision of the Chalcididae (Hymenoptera) of Japan, with description of sixteen new species. *Bulletin the National Institute of Agricultural Sciences, Sseries C (Phytopathology and Entomology)*, 11: 132–363.
- Halstead, J.A. 1990. Revision of *Hockeria* Walker in the Nearctic region with descriptions of males and five new species. *Proceedings of the Entomological Society of Washington*, 92: 619–640.
- Hasanshahi, G., Abbasipour, H., Jahan, F., Askew, R. and Escolà, A.R. 2013. New record of *Brachymeria albicrus* (Klug) (Hymenoptera: Chalcididae) a pupal parasitoid of the cabbage white butterfly, *Pieris rapae* (Linnaeus, 1758) from Iran. *Journal of Biological Control*, 27(2): 124–125.
- Husain, T. and Agarwal, M.M. 1981. Systematic studies on Indian Dirhininae (Hymenoptera: Chalcididae). *Oriental Insects*, 15(2): 179–193.
- Kazemi, M. H. and Lotfalizadeh, H. 2014. *Hockeria magna* Bouček (Hymenoptera: Chalcididae): New record to Iranian chalcidid fauna. *North-western Journal of Zoology*, 10 (1): 183–186.
- Lotfalizadeh, H. 2012. Collection and identification of some species of the genus *Brachymeria* (Hym.:Chalcididae) in Azarbaijane-Sharghi province, northwestern Iran. *Journal of Field Crop Entomology*, 1(4): 37–52.
- Lotfalizadeh, H. 2014. Preliminary faunistic study of Haltichellinae (Hym.:Chalcididae) in East-Azarbaijan province. *Plant Pests Research*, 4(2): 19–30.
- Lotfalizadeh, H. and Jafari-Nadushan, A. 2015. New records of two rare species of the family Chalcididae (Hymenoptera: Chalcidoidea) in Iran, with data on their associations. *Acta Zoologica Bulgarica*, 67(2): 297–298.
- Lotfalizadeh, H. and Khalghani, J. 2008. Hymenopterous parasitoids (Hym.: Chalcidoidea) of xylophagous beetles in Iran. *Entomofauna Zeitschrift für Entomologie*, 29(19): 249–264.
- Lotfalizadeh, H., Ebrahimi, E. and Delvare, G. 2012. A contribution to the knowledge of family Chalcididae (Hymenoptera: Chalcidoidea) in Iran. *Journal of Entomological Society of Iran*, 31: 67–100.
- Masi, L. 1924. Nuove species di *Chalcis* raccoltenella Persia da March. G. Doria. *Annalidel Museo Civico di Storia Naturale Giacomo Doria, Genova*, 10(50): 187–192.
- Masi, L. 1929a, Sopra un nuovo genere di Haltichellini e sulle diverse forme attribuite al genere *Euchalcis* Duf. (Hymen. Chalcididae). *Memorie della Società Entomologica Italiana*, 6: 208–222.
- Masi, L. 1929b. Risultati zoologici della Missione inviata dalla R. Società Geografica Italiana per l'esplorazione dell'Oasi di Giarabub (1926–1927). Hymenoptera Chalcididae. *Annali del Museo Civico di Storia Naturale Giacomo Doria. Genova*, 53: 195–240.
- Masi, L. 1932. Spedizione scientifica all'oasi di Cufra (Marzo-Luglio 1931). Imenotteri terebranti di Gialo e di Cufra. *Annali del Museo Civico di Storia Naturale di Genova*, 55: 431–450.
- Moravvej, S.A., Shishehbor, P. and Lotfalizadeh, H. 2016. A checklist of Chalcidoidea (Insecta: Hymenoptera) of Khuzestan in southwestern Iran. *Journal of Insect Biodiversity and Systematics*, 2 (1): 121–142.
- Narendran, T. C. 1986. Family Chalcididae. 11–41, In: SubbaRao, B. R. and Hayat, M. (Eds). *The Chalcidoidea (Insecta: Hymenoptera) of India and the adjacent countries*. The Association for the Study of Oriental Insects, Oriental Insects, 20: 430 pp.
- Narendran T. C. 1989. *Oriental Chalcididae (Hymenoptera: Chalcidoidea)*. Zoological Monograph. University of Calicut, Department of Zoology, Kerala, India, 441 pp.
- Nikol'skaya, M. 1952. *Chalcids of the fauna of the USSR (Chalcidoidea)*. Opredelitelipo Faune SSSR 44; Moscow and Leningrad, Zoologicheskim Institutom Akademii Nauk SSSR, 575 pp. (In Russian).
- Nikol'skaya, M. N. 1960. Chalcididae and Leucospidae in Central Asia (Hymenoptera, Chalcidoidea). *Trudy Zoologicheskogo Instituta, Akademiya Nauk SSSR, Leningrad*, 27: 220–246. (in Russian).

- Noyes, J.S. 2016. Universal Chalcidoid Database. The Natural History Museum. London, Available from: <http://www.nhm.ac.uk/entomology/chalcidoids> (Accessed June 2016).
- Rajabi, M., Lotfalizadeh H. and Madjdzadeh, S. M. 2011. The family Chalcididae (Hym.: Chalcidoidea) from Kerman province, southeastern Iran with some new records. *Acta Zoologica Bulgarica*, 63(3): 263–268.
- Steffan J.R. 1961. Comportement de *Lasiochalcidia igiliensis* Ms., chalcidide parasite de fourmilions. *Comptes-Rendus de l'Académie des Sciences (Série D)*, 253: 1–3.
- Steffan, J.R. 1966. Les hôtes de *Lasiochalcidia* MS. (Hym.: Chalcididae) de la faune de France. *Bulletin du Muséum National d'Histoire Naturelle*, 38(4): 400–408.
- Steffan, J.R. 1976. Les *Euchalcidia* Masi du bassin méditerranéen (Hym. Chalcididae). *Bulletin de la Société Entomologique de France*, 81(1/2):52–63.

فون زنبورهای خانواده Chalcididae (Hymenoptera: Chalcidoidea) در استان هرمزگان، جنوب ایران

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تاریخ دریافت: ۱۰ تیر ۱۳۹۵، تاریخ پذیرش: ۲۳ تیر ۱۳۹۵، تاریخ انتشار: ۲۳ تیر ۱۳۹۵

چکیده: در مقاله حاضر، اطلاعات پراکنش ۱۳ گونه زنبور از خانواده Chalcididae (Hymenoptera: Chalcidoidea) متعلق به ۹ جنس از سه زیرخانواده Chalcidinae، Dirhininae و Haltichellinae از استان هرمزگان ارایه می شود. تمامی گونه‌های جمع‌آوری شده برای استان گزارش جدید می‌باشند. دو گونه *Dirhinus excavatus* Dalman, 1818 و *Hockeria bifasciata* Walker, 1834 برای اولین بار از ایران گزارش شد. همچنین گونه *D. excavatus* گزارش جدید برای منطقه پالئارکتیک می‌باشد. در این مقاله همچنین یک لیست به روز شده زنبورهای Chalcididae ایران ارایه شده است.

واژگان کلیدی: فون، ایران، پراکنش، تله مالیز، بال غشاییان، Chalcididae