

First record of one genus and two species of cockroach wasps (Hymenoptera: Apoidea: Ampulicidae: Dolichurinae) from Iran

Zahra Ghaderipour¹, Mohammad Khayrandish^{1,*}, Seyed Massoud Madjdzadeh² & Ebrahim Ebrahimi³

1. Department of Plant Protection, Faculty of Agriculture, Shahid Bahonar University of Kerman, Kerman, Iran; 2. Department of Biology, Faculty of Sciences, Shahid Bahonar University of Kerman, Kerman, Iran & 3. Iranian Research Institute of Plant Protection, Agricultural Research, Education and Extension Organization (AREEO), Tehran, Iran.

*Corresponding author, E-mail: m.khayrandish@uk.ac.ir

Abstract

This paper provides a report on Dolichurinae (Hymenoptera: Ampulicidae) collected from different locations of southern Kerman province in southeast Iran from March to September 2017. In the present study, the genus *Dolichurus* Latreille, 1809 (Hymenoptera: Ampulicidae: Dolichurinae) and two species, *Dolichurus haemorrhous* A. Costa, 1886 and *D. corniculus* Spinola, 1808 are recorded from Iran for the first time. Morphological remarks and illustrations of the newly recorded species are provided.

Key words: Ampulicidae, *Dolichurus*, taxonomy, Iran, new records.

اولین گزارش یک جنس و دو گونه از زنبورهای سوسری خوار (Hymenoptera: Apoidea: Ampulicidae: Dolichurinae) از ایران

زهرا قادری پور^۱، محمد خیراندیش^{۱*}، سید مسعود مجدزاده^۲ و ابراهیم ابراهیمی^۳

۱- بخش گیاه‌پزشکی، دانشکده کشاورزی، دانشگاه شهید باهنر کرمان، کرمان، ایران؛ ۲- بخش زیست‌شناسی، دانشکده علوم، دانشگاه شهید باهنر کرمان، کرمان، ایران و ۳- مؤسسه تحقیقات گیاه‌پزشکی کشور، سازمان تحقیقات، آموزش و ترویج کشاورزی، تهران، ایران.

*مسئول مکاتبات، پست الکترونیکی: m.khayrandish@uk.ac.ir

چکیده

این مقاله گزارشی در خصوص زنبورهای زیرخانواده Dolichurinae (Hymenoptera: Ampulicidae) را ارائه می‌دهد. این زنبورها در جریان اسفند ماه سال ۱۳۹۵ تا شهریور ماه سال ۱۳۹۶ از مناطق مختلف جنوب استان کرمان (جنوب شرقی ایران) جمع‌آوری شدند. در مطالعه حاضر، جنس *Dolichurus* Latreille, 1809 و دو گونه *Dolichurus haemorrhous* A. Costa, 1886 و *D. corniculus* Spinola, 1808 برای اولین بار از ایران گزارش می‌شوند. همینطور مشخصات ظاهری به همراه تصاویر مربوط به دو گونه جدید گزارش شده برای ایران، ارائه شده است. واژه‌های کلیدی: *Dolichurus*, Ampulicidae، تاکسونومی، ایران، گزارش‌های جدید.

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Introduction

Ampulicidae is a cosmopolitan family of parasitic wasps, with about 202 species described throughout the world (Pulawski, 2016). Its potential application to biological control of cockroaches was proposed by Arvidson *et al.* (2018). The species of this subfamily nest in cavities both in the soil and in decayed wood near the ground. Members of the genus *Dolichurus* have the nest with simple structure, consisting of a single larval chamber, which often is only a pre-existing cavity in the ground. Larval provision consists of cockroaches

(Blattodea), *Ectobius* sp. (Lomholdt, 1975-1976). The occurrence of sexual dimorphism with in the family Ampulicidae was studied by Bohart & Menke (1976). The family Ampulicidae comprises two subfamilies and six tribes. The subfamily Ampulicinae comprises three tribes: Ampulicini Shuckard, 1840, Cretampulicini Antropov, 2000 and Mendampulicini Antropov, 2000, and subfamily Dolichurinae includes three tribes: Aphelotomini Ohl & Spahn, 2009, Apodolichurini Antropov, 2000 and Dolichurini Dahlbom, 1842 (Pulawski, 2011). *Dolichurus* is the largest genus in the tribe Dolichurini, which is a cosmopolitan genus with about 50 species worldwide (Nearctic 1, Neotropical 2, Palearctic 6, Ethiopian 10, Oriental 27 and Australian 4) (Pulawski, 2018). Taxonomy of the genus *Dolichurus* has been studied by several researchers (Bohart & Menke, 1976; Tsuneki, 1992; Ohl, 2002; Ohl *et al.*, 2004; Ohl & Spahn, 2010; Ohl, 2011).

Iranian Spheciformes have been studied by Morice (1921); Gussakovskij (1933); Pulawski (1971, 1984, 1992, 2007); Dollfuss (2006, 2008); De Beaumont (1957,1970); Esmaili & Rastegar (1974); Ebrahimi (1993, 2000, 2005, 2008, 2014); Fallahzadeh *et al.* (2006, 2009, 2018); Ghazi-Soltani *et al.* (2006, 2009, 2010a, b, c); Samin & Bagriacik (2015, 2016); Samin *et al.* (2015); Atbaei *et al.* (2015); Rezaei & Fallahzadeh (2015); Jahantigh *et al.* (2017); Ghahari (2018); Sadeghi *et al.* (2019). Majority of recent faunistic studies have been focused on northern, north-western, central, south-western and south-eastern provinces. The spheciformes fauna of Kerman province is relatively poorly known. A total of two species of Ampulicidae belonging to two genera, *Ampulex* Jurine, 1807 and *Trirogma* Westwood, 1841 were previously reported from Iran.

Here, we present new data on the occurrence of *Dolichurus* and two species in southern parts of Kerman province.

Materials and methods

The specimens were collected by Malaise traps from several localities in southern Kerman province (Fig. 1) from March to September 2017. The specimens were extracted from the Malaise traps and stored in 75% ethanol, then mounted and labeled.

The external morphology of specimens was studied with an Olympus SZ 60 Stereo microscope and illustrated using 650D digital Canon camera mounted with an adapter on OlympusSZH-ILLB Stereomicroscope. The illustrations were processed in Adobe photoshop 2018. Identifications were done using the keys of Krombein (1979), Dollfuss (1991), Tsuneki (1992) and Ohl (2002).

Terminology generally follows that of Bohart & Menke (1976), Tsuneki (1992), Ohl (2002, 2011), Ohl & Spahn (2010) and Ohl *et al.* (2004). The voucher specimens are deposited in Zoological Museum of Shahid Bahonar University of Kerman, Kerman, Iran (ZMSBUK), and Iranian Research Institute of plant Protection, Tehran, Iran.

A total of five specimens of the genus *Dolichurus* were collected representing two species (*D. haemorrhous* A. Costa, 1886 and *D. corniculatus* Spinola, 1808). These two species are new for the Iranian fauna.

Results

Family: Ampulicidae Shuckard, 1840

Subfamily: Dolichurinae Dahlbom, 1842

Genus *Dolichurus* Latreille, 1809

Diagnosis: Antennal bases covered by a median frontal platform; notauli well developed, extending to posterior scutal margin; forewing media diverging after cu-a; hindwing jugal lobe present and media diverging before cu-a; petiole inserted above hind coxae; metasoma sessile.

***Dolichurus corniculatus* Spinola, 1808**

Material examined: (1♂); Iran, Kerman province, 1♂, Kahnuj, Dehkahan (27°41'52.8"N, 57°32'10.7"E, 785 m a.s.l.), 11.iv.2017, Malaise trap, leg.: M. Purrezaali.

Diagnosis: Male (Fig. 2, A): Body length 8.9 mm, black; antenna black and 13-segmented (Fig. 2, B); mandibular socket closed, the median lobe of the clypeus with 3 teeth, clypeus and base of mandible black (Fig. 2, C); frons with distinctly punctuation, base of antennae covered by a median frontal platform (Fig. 2, D); legs black, long and slender; first recurrent vein meets second submarginal cell, second recurrent vein meets third submarginal cell (Fig. 2, F); metasoma sessile, tergite 1-3 shiny, tergite 1 with scattered punctures compared to tergite 3 (1.0-1.9X their own diameter) (Fig. 2, E & G).

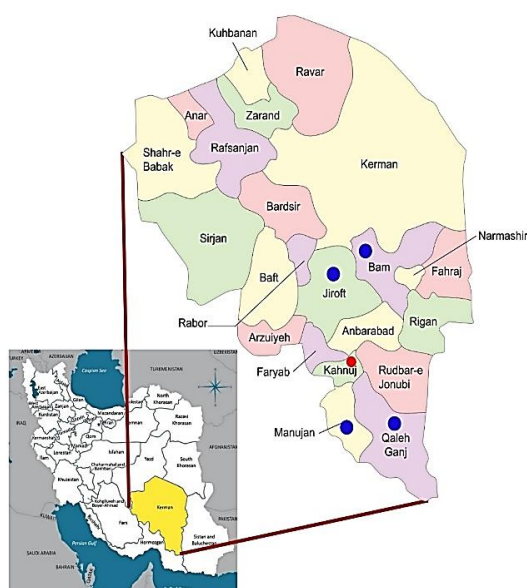


Fig. 1. Geographic map of the collected species of cockroach wasps (Hym.: Ampulicidae: Dolichurinae) in the southeast of Iran. Red point indicates the collected site of *Dolichurus corniculatus* and blue points indicate the collected sites of *D. haemorrhous*

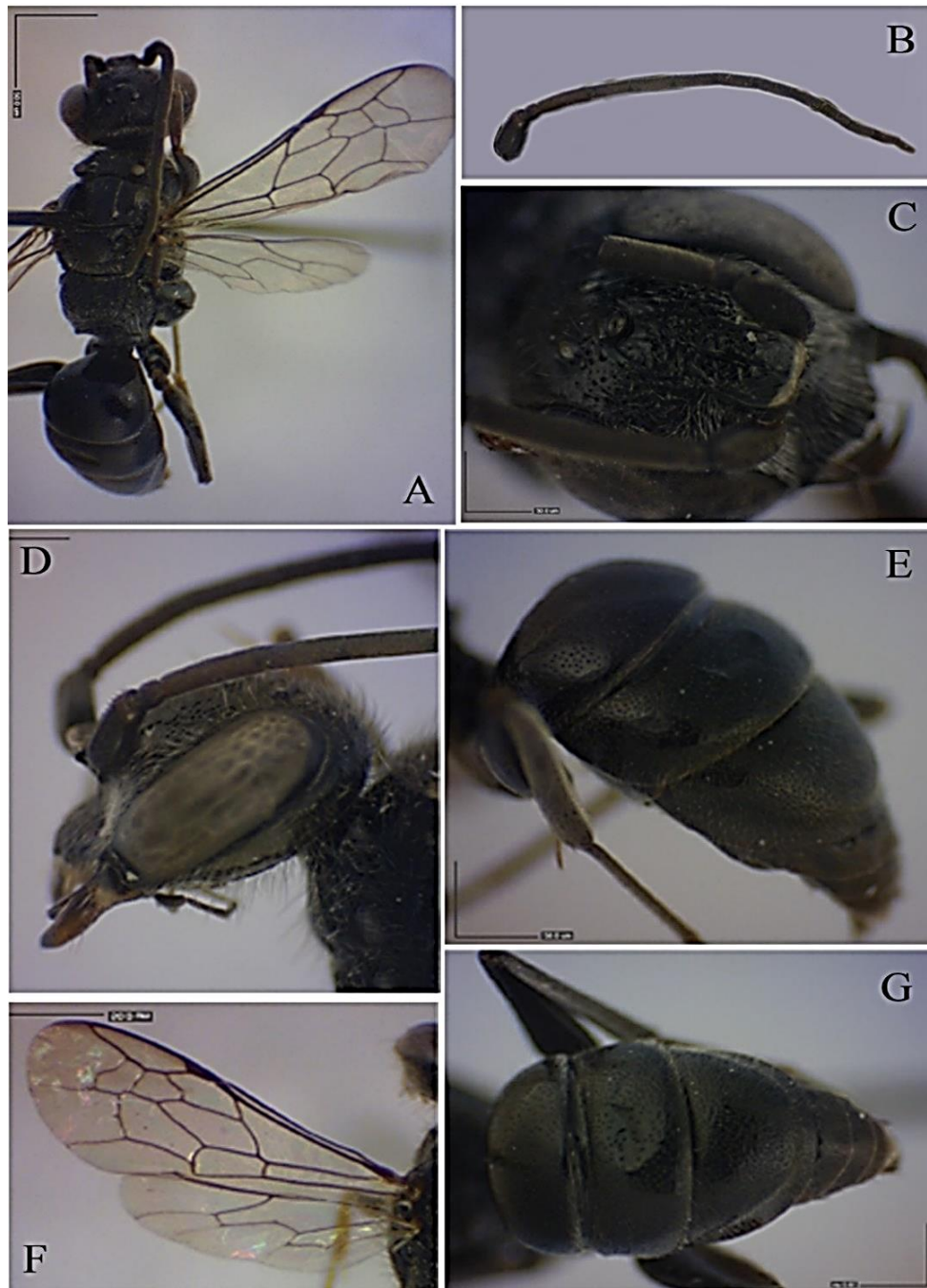


Fig. 2. *Dolichurus corniculus*, Male; A. Adult, dorsal view; B. Antenna; C. Median frontal platform; D. Mandible lateral view; E. Metasomal terga lateral view; F. Forewing; G. Metasomal terga dorsal view.

General distribution: Europe, Sweden, Finland, Turkey and North Africa (Lomholdt, 1975-1976; Bitsch & Barbier, 1997); new for the fauna of Iran.

***Dolichurus haemorrhous* A. Costa, 1886**

Material examined: (1♂, 3♀♀): Iran, Kerman province: 1♂, Manujan, Chah Nasri (27°31'14.6"N, 57°33'51.5"E, 384 m a.s.l.), 10.iv.2017, Malaise trap, leg.: S.M. Madjdzadeh;

1♀, Jiroft, Mijan-Sar Asiab (28°41'06.6"N, 57°55'17.7"E 1288 m a.s.l.), 20.iv.2017, Malaise trap, leg.: S.M. Madjdzadeh; 1♀, Bam, Bam (29°06'01.7"N, 58°19'44.0"E 1111 m a.s.l.), 04.vii.2017, Malaise trap, leg.: M. Purrezaali; 1♀, Qal-e-Gang, Galeh-Ganj (27°29'59.1"N, 57°54'13.9"E 402 m a.s.l.), 09.v.2017, Malaise trap, leg.: S.M. Madjdzadeh.

Diagnosis: Male (Fig. 3, A): Body length 9.0 mm black; antennae light brown and 13-segmented; (Fig. 3, B); antennal base covered by a median frontal platform, mandibles ferruginous except their base and teeth black, median lobe of the clypeus with 3 short teeth, clypeus with two whitish spots at the base (Fig. 3, C); frons punctuated and reticulated (Fig. 3, D); collar of pronotum with two whitish spots laterally; tegula, tibia and tarsi dark-brown; forewing and hindwing hyaline, hindwing media diverging before cu-a (Fig. 3, E). tergite 1-3 shiny, tergite 3 more densely punctured compared to tergite 1 (Fig. 3, F & G).

Female (Fig. 4, A): Body length 10 mm black; frons from base of frontal platform to mid ocellus irregularly rugose (Fig. 4, B); mandibular base, clypeus, frons and collar with long setae (their length twice the diameter of mid ocellus or more); clypeus with free edge simple (not denticulate) and convex medially; scutum with developed notauli and hind part of propodeal surface coarsely rugose (Fig. 4, C & D); small jugal lob of hindwing visible (Fig. 4, E); metasoma sessile in lateral view terga shiny, tergum III almost totally black (Fig. 4, F & G); coloration: mandible at media, anterior platform margin, scape, tergum IV-VI ferruginous; tegula yellowish, flagellum light brown, (Fig. 4, A) fore tibiae and tarsi light brown (Fig. 4, H).

General distribution: Southern Europe and North Africa (Bitsch & Barbier, 1997; Shorenko, 2007); new for the fauna of Iran.

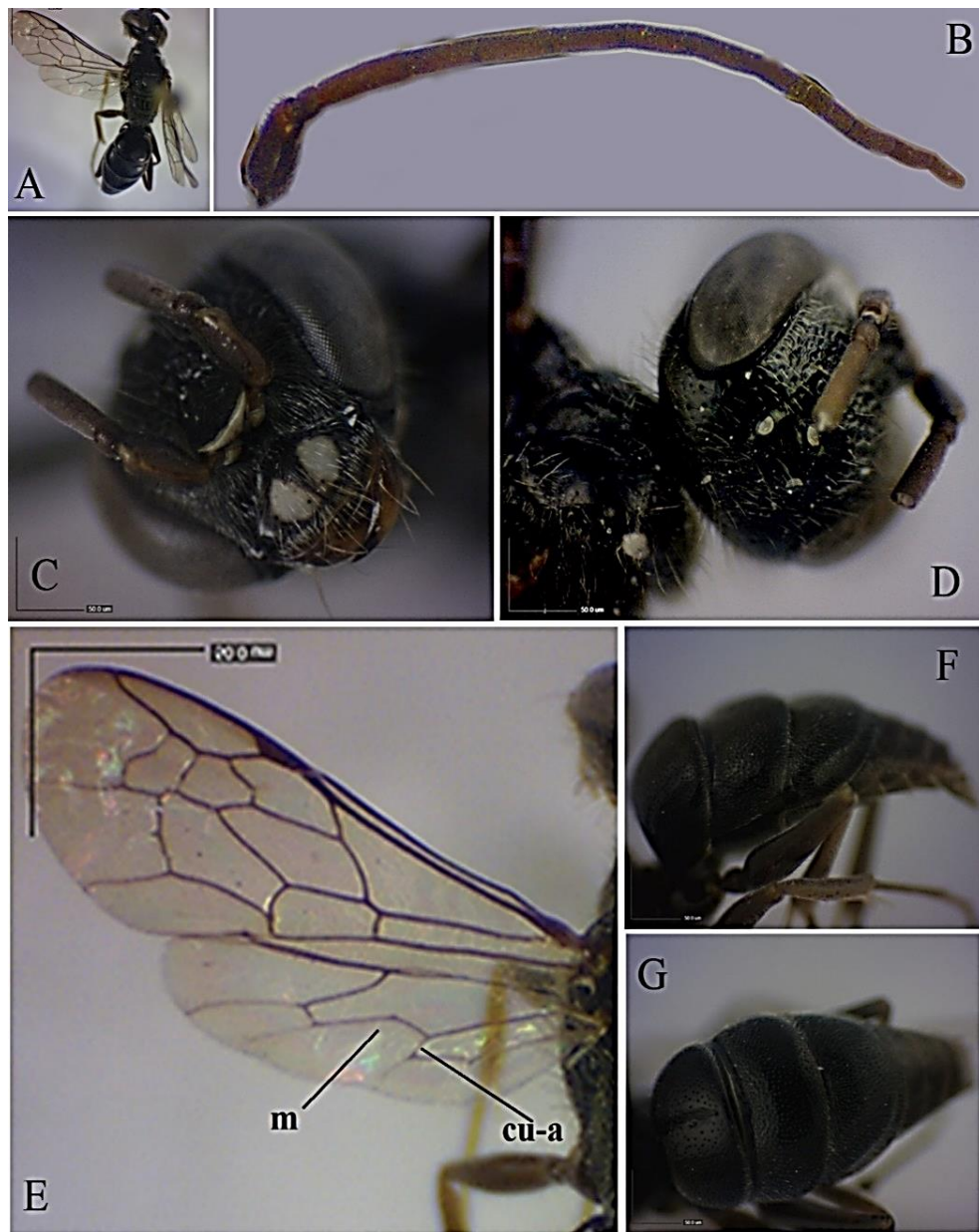


Fig. 3. *Dolichurus haemorrhous*, Male; A. Adult, dorsal view; B. Antennae; C. Clypeus; D. Frons; E. Hindwing; F. & G. Metasomal terga.

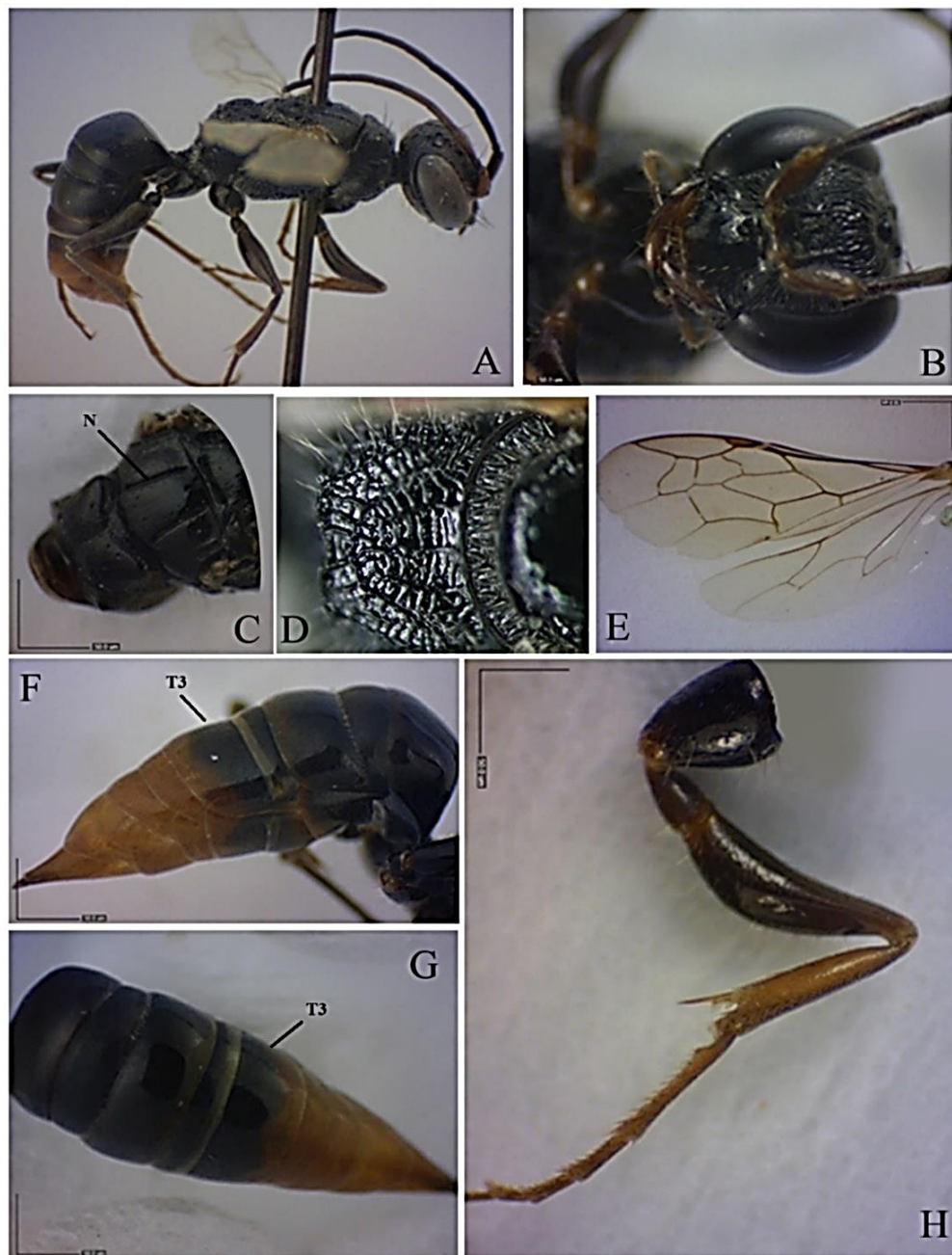


Fig. 4. *Dolichurus haemorrhous*, female; A. Adult, lateral view; B. Frons; C. Notauli well developed; D. Propodal dorsal surface; E. Forewing; F. & G. Metasoma; H. Fore leg.

Discussion

The results of this study showed the presence of the genus *Dolichurus* in southern Iran including two species, *D. haemorrhous* and *D. corniculus* with low number of each species. However, *Trirogma caerulea* Westwood, 1841 is widely distributed in Iran (Ghahari, 2018) and *Ampulex compressa* Fabricius, 1781 (Ampulicinae) is recorded only from Sistan-o-Baluchestan province (Jahantigh *et al.*, 2017).

The majority of the two new recorded species are widely distributed in Europe, Southern Europe and North Africa (Lomholdt, 1975-1976; Bitsch & Barbier, 1997; Shorenko, 2007).

Including our finding, the number of Iranian records of Ampulicidae increased to four species (Table 1).

Table 1. Distribution of recorded species of Ampulicidae in Iran.

Scientific name	Subfamily	Distribution in Iran (province)	Reference
<i>Ampulex compressa</i> (Fabricius, 1781)	Ampulicinae	Sistan-o Baluchestan	Jahantigh <i>et al.</i> (2017)
<i>Dolichurus haemorrhous</i> A. Costa, 1886	Dolichurinae	Kerman	Current study
<i>Dolichurus corniculus</i> Spinola, 1807	Dolichurinae	Kerman	Current study
		Tehran, Markazi	Ebrahimi (2008, 2014)
<i>Trirogma caerulea</i> Westwood, 1841	Dolichurinae	Mazandaran, Guilan, West Azarbijan, Zanjan, Qazvin, Chaharmahal-o-Bakhtiari, Khuzestan, Lorestan, Yazd, Kerman	Ghahari (2018)

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