Two new records of the genus *Conophorus* (Diptera: Bombyliidae: Bombyliinae) from Iran

Saeedeh Hakimian¹, Ali Asghar Talebi¹ and Babak Gharali²

1. Department of Entomology, Faculty of Agriculture, Tarbiat Modares University, P. O. Box: 14115-336, Tehran, Iran.
2. Department of Entomology, Research Center for Agriculture and Natural Resources, Shahid Beheshti Blvd. No. 118, P. O. Box: 34185-618, Ghazvin, Iran.

**Abstract:** The genus *Conophorus* Meigen, 1803 (Diptera: Bombyliidae: Conophorini) was studied in the north and northwestern parts of Iran. Three species of the genus *Conophorus* were identified; two of them are recorded for the first time from Iran, namely: *C. pseudaduncus* Paramonov, 1929 and *C. rjabovi* Paramonov, 1929, in addition to *C. glaucescens* (Loew, 1863), which was previously recorded in Iran. Morphological characters, geographical distributions, and an identification key for the three collected species are provided.

**Keywords:** Diptera, Bombyliidae, *Conophorus*, new record, Iran.

**Introduction**

Family Bombyliidae, commonly called bee flies, is one of the largest families of Diptera (Brachycera) with more than 4600 known species worldwide (Evenhuis and Greathead, 2003). These flies occur in all continents, but are most common in arid and semiarid environments (Hull, 1973), and poorly represented in the Arctic, Antarctic and oceanic Islands. Their larvae are predators or parasitoids of eggs and larvae of other insects such as other Diptera, Hymenoptera, Coleoptera and Lepidoptera (Du Merle, 1975). Some species are important natural enemies of major pests including locusts and grasshoppers, armyworms, slug and nettle caterpillars, and tsetse flies (Evenhuis and Greatheath, 1999). Adults generally feed on nectar and pollen, thus may play an important role in pollination of wild flowers (Hull, 1973).

The genus *Conophorus* Meigen, 1803 (Bombyliidae: Bombyliinae: Conophorini) occurs only in the Palaearctic and Nearctic regions and includes 67 known species (Evenhuis and Greathead, 1999). It belongs to the tribe Conophorini, can be distinguished by the following combination of characters: postcranium flattened with a single occipital foramen; scape strongly swollen, flagellum without an apical sulcus, palpi present; tibial spurs absent; abdomen ovate or cordate (Greathead and Evenhuis, 1997). According to the world catalog of bee flies (Evenhuis and Greathead, 1999), six species of this genus have been previously recorded from Iran, namely: *C. virescens* (Fabricius, 1787), *C. syriacus* Paramonov, 1929, *C. rossicus* Paramonov, 1929, *C. nobilis* (Loew, 1787), *C. monticola* Paramonov, 1929, *C. asiaticus* Paramonov, 1929. In the present study, three species of genus *Conophorus* collected from the north and northwest of Iran are briefly reviewed, and basic information for further studies is provided.

**Materials and Methods**

Materials for this study were collected from some parts of north and northwestern Iran using Malaise traps during 2008-2011 (Fig. 1).
Samplings were performed during March to November. Specimens were dehydrated in 99.6% ethanol for 5-10 minutes and then placed in a pure solution of hexamethyldisilazane (HMDS) for 15-20 minutes. The specimens were finally placed in a glass plate for drying. The dried specimens were then labeled. Illustrations were made using the Olympus SZX9 stereomicroscope equipped with a Sony CCD digital camera. Female genitalia preparations were made by macerating the apical portion of abdomen in cold 10% KOH for 14-15 hours, then washed with distilled water, transferred to fresh glycerin and mounted on slide. Morphological terminology follows Greathead and Evenhuis (1997), Zaitzev (1966) and Paramonov (1929). All specimens are deposited in the insect collection of the Department of Entomology, Tarbiat Modares University, Tehran, Iran.

Results

Three species of the genus Conophorus including: C. glaucescens, C. pseudaduncus and C. rjabovi were collected and identified from the studied area. Two species C. pseudaduncus and C. rjabovi are new records for the fauna of Iran. Key to species of the genus Conophorus collected in this study

1- Wing with three submarginal cells (Fig. 2A), scutellum laterally bulged, body covered with yellow hairs (Fig. 2B)............ Conophorus glaucescens (Loew, 1863) - Wing with two submarginal cells, scutellum normal, not bulged (Fig. 3A, 4A).............2

2- Wing transparent, vein R 2+3 deeply curved apically (Fig. 3A), Conophorus pseudaduncus Paramonov, 1929 - Wing smoky, vein R 2+3 slightly curved apically (Fig. 4A). Conophorus rjabovi Paramonov, 1929

Conophorus glaucescens (Loew, 1863) (Fig. 2) Ploas glaucescens Loew, 1863: 34.

Material examined: IRAN, Qazvin province, Zarabad, 36°38’ N, 48°35’ E, 1520 m.a.s.l, 13.vi. 2008, (1♂, 1♀); Highway Qazvin-
Zanjan, 36°28’ N, 50°24’ E, 1735 m.a.s.l, 23.v.2009, (1♀); Zeresk road, 36°25’ N, 50°06’ E, 1926 m.a.s.l, 26.v.2011, (1♀), East Azerbaijan province, Arasbaran, 26.VI.2009, (1♂); Leg. B. Gharali; (Fig. 1).

**General distribution:** Western Palaearctic (Mediterranean, Central Asia) (Evenhuis and Greathead, 1999), Iran (Sakenin Chelav et al., 2008).

**Diagnosis:** Head (Fig. 2B) as wide as thorax; occiput gray, with black hairs; frons swollen, with long black hairs; antenna basally with white hairs; ocellar triangle gray with long black hairs; antenna black, with yellow hairs dorsally and black hairs ventrally, flagellomere ellipsoid, narrowed basally, first flagellomere equal to pedicel and scape combined; proboscis as long as head. Thorax (Fig. 2B): mesonotum with long greenish-yellow hairs; scutellum with greenish-yellow hairs. Wing (Fig. 3A): transparent, with two submarginal cells, r-m vein positioned before middle of discal cell, vein R2 + 3 strongly curved apically. Halter stalk yellow and club black. Legs: black, femora with greenish yellow scales; tibia with black spines; tarsi brown, with black spines, empodium white and equal to claw in length. Abdomen: black, covered with long greenish yellow hairs. Female genitalia: spermathecal reservoir (Fig. 3C) pear-shaped, sclerotized and brown, furca U-shaped (Fig. 3D), lateral arms strongly sclerotized and inwardly bent.

**Conophorus rjabovi** Paramonov, 1929 (Fig. 4)

*Conophorus rjabovi* Paramonov, 1929: 179 (117).

**Material examined:** IRAN, *Alborz province*, Shahrestanak, 35°57’N, 51°22’ E, 2305 m.a.s.l., 25.v.2010, (1♂); *Gilan province*, Ghazichak, 36°45’N, 50°19’E, 1803 m.a.s.l., 18.v.2010, (1♀); Leg. M. Kheirandish; (Fig. 1).

**General distribution:** Central Asia (Evenhuis and Greathead, 1999). New record from Iran.

**Diagnosis:** Head (Fig. 3B) as wide as thorax in dorsal view; ocellar triangle black with short black hairs; antenna black, with yellow hairs dorsally and black hairs ventrally, flagellomere ellipsoid, narrowed basally, first flagellomere equal to pedicel and scape combined; proboscis as long as head. Thorax (Fig. 3B): mesonotum with long yellow hairs; scutellum with short yellow hairs. Wing (Fig. 4A): smoky, with two submarginal cells, cross vein r-m before middle of discal cell,
vein R₂ + 3 slightly curved apically. Halter yellow. Legs: black, covered with black and yellow scales and scattered black spines. Abdomen (Fig. 4B): black, covered with long pale yellow and black hairs. Female genitalia: spermathecal reservoir (Fig. 4C) conical, sclerotized and brown, apical spermathecal duct six times of sperm pump in length, sperm pump membranous, basal spermathecal duct 1.5 times the length of sperm pump, common spermathecal duct equal to sperm pump in length, furca U-shaped (Fig. 4D), lateral arms strongly sclerotized and inwardly bent, acanthophorite with sixteen spines (Fig. 4D).

Discussion

The genus *Conophorus* has been reported from tropical, temperate and Mediterranean climates (Evenhuis and Greathead, 1999). The samples in the current study were also collected from temperate areas in northern and north-western Iran in late May to June. With respect to the current study, the number of Iranian species of the genus *Conophorus* increases up to 11 (Evenhuis and Greathead, 1999). Three species of this genus have only been recorded from Egypt (El-hawagry, 2002; Evenhuis and Greathead, 1999); two species from Slovakia (Evenhuis and Greathead, 1999) and five species from Turkey (Dils and Ozbeck, 2006). The checklist of the tribe

**Figure 2** *Conophorus glaucescens*, female: A) wing, B) dorsal view of general habitus, C) female genitalia.

**Figure 3** *Conophorus pseudaduncus*, female: A) wing, B) dorsal view of general habitus, C) spermathecal reservoir, D) furca.
Bombyliini published by Hakimian et al. (2012) compiles 5 genera and 39 species. However, the tribe Conophorini was poorly studied in Iran and only 7 species of the genus *Conophorus* have previously been reported from Iran (Sakenin Chelav et al., 2008; Evenhuis and Greathead, 1999). Further studies are necessary to have a good insight into the bombyliid fauna of Iran.

**Acknowledgments**

We thank the Department of Entomology, Tarbiat Modares University for providing financial support for this research. The authors are grateful to Dr. Neal L. Evenhuis for sending necessary literature. Our cordial thanks are expressed to Mr. A. Nadimi and Mr. M. Kheyrandish (Ph.D. students of Tarbiat Modares University, Tehran, Iran) for collecting specimens studied in this paper. We also thank three anonymous reviewers for their valuable comments and recommendations on the earlier version of this paper.

**References**


گزارش دو رکورد جدید از جنس Conophorus (Diptera: Bombyliidae: Bombyliinae) از ایران

سعیده حکیمیان ۱، علی اصغر طالبی ۲ و بابک قرالی ۲

۱- تهران، دانشگاه تربیت مدرس، دانشکده کشاورزی، گروه جهانه‌شناسی، صندوق پستی ۲۲۴۰، تهران، ۱۴۱۵-۱۳۹۱
۲- قزوین، مرکز تحقیقات کشاورزی و منابع طبیعی، بخش گیاه‌پرستی، صندوق پستی ۳۴۱۸۵-۶۱۸، قزوین، ۱۴۱۸-۱۳۹۱

* پست الکترونیکی نویسندگان: talebia@modares.ac.ir

دریافت: ۲۰ دی ۱۳۹۱، پذیرش: ۹ اسفند ۱۳۹۱

چکیده: جنس Conophorus Meigen, 1803 (Diptera: Bombyliidae: Conophorini) غرب ایران مورد مطالعه قرار گرفت. سه گونه از این جنس شناسایی شدند که در شمال و شمال شرقی Conophorus glaucescens (Loew, 1863) و C. rjabovi Paramonov, 1929 و Paramonov, 1929 برای اولین بار از ایران گزارش گردیدند. C. rjabovi Paramonov, 1929 و C. pseudadhuc Paramonov, 1929 از این جنس شناسایی شدند که در غرب ایران مورد مطالعه قرار گرفت. سه گونه از این جنس، C. pseudadhuc Paramonov, 1929 و C. rjabovi Paramonov, 1929 و C. glaucescens (Loew, 1863) برای اولین بار از ایران گزارش گردیدند.

واژگان کلیدی: Conophorinae, Bombyliidae, Conophorus, Diptera.