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Presence of ephedra gall midge, *Ephedromyia debilopalpis* Marikovskij (Diptera: Cecidomyiidae) in Iran

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ABSTRACT. We reared *Ephedromyia debilopalpis* Marikovskij (Dip.: Cecidomyiidae) for the fist time on *Ephedra major* (Ephedraceae) in the northwest of Iran in 2016. This is the new record of the genus and species for Iran. With including this new record, the known gall midge fauna of Iran reached 62 species and 34 genera.

Key words: Diptera, *Ephedromyia*, Iran, distribution, new record, Ephedraceae

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Introduction

The family Ephedraceae includes only one genus, *Ephedra*, with 67 species which occur in Europe, Asia, North and South America. These plants inhabit both warm and cold biotops and may grow in deserts of Middle Asia and also at the seaside of the Black-Sea in Bulgaria. *Ephedra* species are spread far to the North and occur also at high altitudes in the mountain with 5400 m a.s.l. in the Himalaya Mts. in Asia and in the Andes in South America with 4700 m a.s.l.. *Ephedra* species are often important components of sagebrush steppes which are formed of various *Artemisia* species. In the region Palaearctic, different species of *Ephedra* are widely distributed in the Mediterranean basin and in some part of Asia (Ghahraman, 2006; Ghahraman & Attar, 1999; The Plant List, 2013).

Different herbivorus insects attacks *Ephedra,* that the gall middges (Dipt.: Cecidomyiidae) are one of them. The Cecidomyiidae with 6590 species in 812 genera in the world are one of the most specious families of Diptera (Gagné & Jaschhof, 2017). The known gall midge fauna of Iran is composed of 61 species in 33 genera which are associated with 50 plant species belonging to fifteen plant families (Skuhravá et al., 2014). Two gall midge species of the genus *Xerephedromyia* associated with *Ephedra major* were recorded in the Kerman province in Iran (Moeinadini et al., 2017).

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Eleven species of gall midges are known to be associated with the host plants of the genus *Ephedra* in the world. Nine species of two genera (*Ephedromyia* and *Xerephedromyia*) which cause stem galls of various shape on *Ephedra* species in Asia, and two gall midge species of the genus *Lasioptera* which cause stem galls on *Ephedra* species in North America (Skuhravá, 1986; Gagné, 1989).

Material and methods

During our field collection of insect fauna associated with *Ephedra* in the northwest of Iran in 2016 (Hadi et al., 2017), we discovered stem galls of gall midge species belonging to the genus, *Ephedromyia,* which causes galls on stems of *Ephedra major* (Fig. 1B). Globular galls on stems of *E. major* were found at the locality Kordasht (geographic coordinates: 46°14'45.0"E & 38°52'11.0"N; at altitude of 551m a. s. l.) in the East-Azarbaijan province (Figs 1A & 2). Galls were collected on 19 April 2016 and transferred in polyethylen bag to the Entomology Laboratory of the Plant Protection Department, East-Azarbaijan Agricultural and Natural Resources Research Center, Tabriz.

Reared adults of gall midges were identified to the genus level using the key of Skuhravá (1997) and to the species level using the key of Fedotova (2000). The galls and specimens examined in this study are deposited in the insect collection of the Department of Plant Protection, East-Azarbaijan Research Center for Agriculture and Natural Resources, Tabriz, Iran, and in the gall midge collection of Marcela Skuhravá, Praha, Czech Republic.

Results

Galls on stems of *Ephedra major* were rounded, 9–13 mm in diameter, with brown unregular surface (Fig. 1D). Several adults emerged from galls in the polyethylen bag during May 2016.

Our finding of *Ephedromyia debilopalpis* (Fig. 1C) in this research is the first record of this species and genus in Iran. We enriched the gall midge fauna of Iran for one species and one genus. The present fauna of gall midges of Iran is composed of 62 species and 34 genera.

Discussion

Marikovskij (1953) found stem galls on *Ephedra* sp. in the mountains of Kazakhstan (Mount Chulak, Dzhungarskii Alatau) and described species as *Ephedromyia debilopalpis.* He described a male, female, gall and biology in detail. Only one generation develop per year. Adults emerge from galls in the spring and females lay eggs on young branches of *Ephedra.* Larvae develop inside stem and cause globular galls. They hibernate inside galls where they pupate in the spring of the following year. Fedotova (2000) gave as the host plant species *Ephedra lomatolepis* Schrenk and Kazakhstah as the distribution area; therefor, *Ephedra major* is a new host plant for this gall middge. Gagné and Jaschhof (2017) in their catalog gave that *E. debilopalpis* occurs also in the European part of Russia and in Turkmenistan but they do not give any reference supporting it. But Raymond Gagné in his letter of 12 September 2017 answered M.S. that he cannot find the reference for the geographic extensions of *Ephedromyia debilopalpis* in European part of Russia and Turkmenistan and that he will remove this information from the catalog.

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Conflict of Interests

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

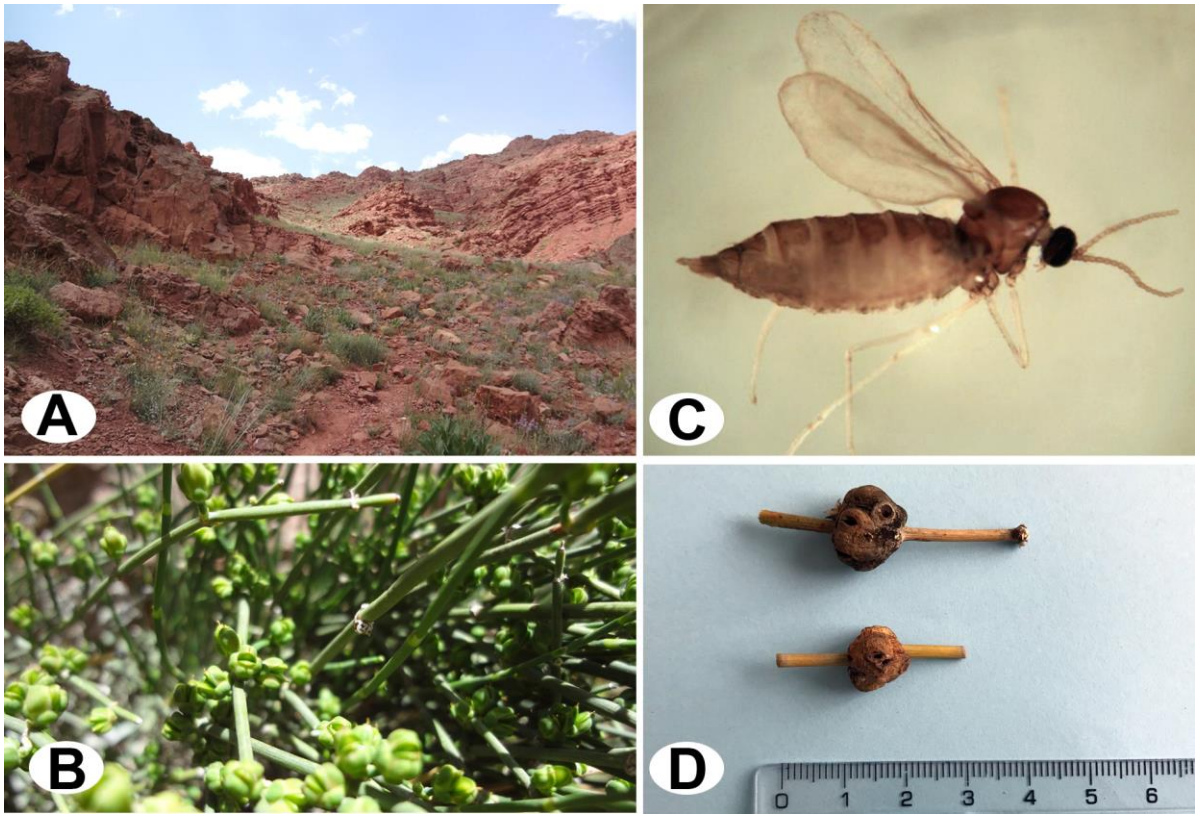

Figure 1. A) Collection locality in the northwest of Iran, B) *Ephedra major*, C) Adult of *Ephedromyia debilopalpis*, D) Two galls of *E. debilopalpis*, on stem of *E. major* in Iran.

Figure 2. Map of Iran including collection site of *Ephedromyia debilopalpis* in the northest.

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حضور پشه گالزای افدرا *Ephedromyia debilopalpis* Marikovskij (Diptera: Cecidomyiidae) در ایران

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چکیـــده: برای نخستین بار پشه گالزای افدرا *Ephedromyia debilopalpis* Marikovskij (Dipt.: Cecidomyiidae) از روی گونه *Ephedra major* متعلق به تیره Ephedraceae در شمال‌غرب ایران طی سال ۱۳۹۵ پرورش داده شد. این نخستین گزارش جنس و گونه از ایران می‌باشد. با افزوده شدن این گونه به فون ایران، تعداد پشه‌های گالزا در ایران به ۶۲ گونه و ۳۴ جنس می‌رسد.

واژگـــان کلیـــدی: دوبـالان، *Ephedromyia*، ایـــران، پـراکنش، گـزارش جدیـد، Ephedraceae