Israelius carthami Richards, 1952 (Hym.: Bethylidae): A rarely found species in the Palaearctic region

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ABSTRACT. Israelius carthami Richards, 1952 was recorded for the first time from Iran, based on reared specimens from three Asteraceae capitulum: Cirsium congestum Fisch. & C.A.Mey., Carthamus lanatus L. and Xeranthemums quarrosum Boiss. In our rearing, a fruit fly species [Terellia nigripalpis Hendel (Diptera: Tephritidae)] was obtained on C. congestum. All host-plant associations are newly established to the science. General distribution of this parasitoid and their biological associations were discussed.

Key words: Host, distribution, new record, Chrysidoidea, Sclerodermini

Introduction

Bethylidae (Hymenoptera: Chrysidoidea) are a cosmopolitan family including about 2,600 species classified in six subfamilies (Azevedo et al., 2015). Bethylids are ectoparasitoids of larvae and occasionally pupae of Coleoptera and Lepidoptera, mostly in concealed situations (Terayama, 2003, 2006). The host may be paralyses or killed with single or multiple sting of the female. Poison of bethylids has high efficiency and a sting of some species can be painful as well for man (Macek et al., 2007).

The tribe Sclerodemini currently has 13 genera and 114 species that are distributed throughout the world (Lanes and Azevedo, 2008). The genus Israelius with two species is a small genus in this tribe (Barbosa et al., 2014).

The family Bethylidae was studied poorly in Iran and it was presented by Samadi-Afshar et al. (2012, 2013), who recorded eight species of genus Epyris in the northwestern of Iran. So far, 28 species belonging to 13 genera reported from Iran which 10 genera and 19 species recorded from East and West Azarbaijan (Samadi-Afshar et al., 2013).

During our recent laboratory rearing fruit flies associated with Asteraceae, we obtained some bethylid wasps that are object of this paper.


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Material and methods

This study was carried out in the northwest of Iran including East and West-Azarbaijan provinces in 2013 (Fig. 2). In order to rearing the fruit flies and their associated parasitoids, flower heads of different species of Asteraceae were collected and kept in cylindrical plastic boxes (9R and 13H cm) at 25±2°C until the adults of fruit flies and parasitoid wasps were emerged. Several bethylid wasps were obtained in our laboratory rearing that were collected from three localities.

External morphology was illustrated using an Olympus™ SZH, equipped with a Canon™ A720 digital camera. The specimens were identified according to the reliable keys and descriptions (Richards, 1952, 1956; Terayama, 2003, 2006; Barbosa et al., 2014). Specimens were deposited in the insect collection of the Department of Plant Protection, East-Azarbaijan Agricultural and Natural Resources Research and Education Center, Tabriz, Iran. The sample coordinates are shown in decimal degree format.

Results

Our reared bethylid specimens were belong to the genus Israelius Richards (Bethylidae, Scleroderminae) that its characteristic is dilation of the forewing basal vein (Fig. 1A) (Lanes and Azevedo, 2008; Barbosa et al., 2014). It was identified as Israelius carthami Richards that is new record for Iranian fauna. It was obtained from three asteraceous plants: Cirsium congestum Fisch. & C. A. Mey., Carthamus lanatus L. and Xeranthemum squarrosum Boiss.

Israelius carthami Richards, 1952

(Fig. 1A - C)

Material examined: IRAN, East Azarbaijan province, Ahar (38°11’45”N, 47°17’47”E, 1462m), 30 September 2013, 1♀, 1♂; ex Carthamus lanatus, Aras (38°40’59”N, 45°39’19”E, 1435m) 29 October 2013, 1♀, 1♂; ex Xeranthemum squarrosum, Shibli hill (37°57’52”N, 46°15’45”E, 1959m), 15 September 2013, 1♀, 1♂; ex Cirsium congestum, leg.: A.R. Pourhaji.

Diagnosis: Our studied specimens have all of morphological characters of I. carthami described by Richards (1952) and Barbosa et al. (2014).

Female and male, length of body 1.8-2.2 mm: the head as long as wide (Fig. 1C); mandible with two apical teeth; the clypeus with median lobe fused with lateral lobe, the median clypeal carina arched; the frontal angle of ocellar triangle right, the ocelli and oculi small; the mesoscutum without notaules and as long as mesoscutellum (Fig. 1B); the parapsidal-signum inconspicuous; the mesoscutellum with sulcus narrow and with lateral pit; the propodeal disc with posterior half part strigate, without median emargination at anterior margin, the median carina absent, the lateral carina inconspicuous, the posterior carina absent; the mesopleuron without foveae; forewing without vein C (Fig. 1A), with r-rs & Rs vein short; hind wing without hamuli.

Geographical distribution: This species was known only from Israel (Richards, 1952; Barbosa et al., 2014) while, it was recorded from former Czechoslovakia and Greece by Strejcek (1989). It is new record to fauna of Iran. Its distribution in the northwest of Iran was presented in Fig. 2.

Host association: We bred this species for the first time on Cirsium congestum, Carthamus lanatus and Xeranthemum squarrosum. On C. congestum, it was bred with Terellia nigripalpis Hendel (Diptera: Tephritidae). Also type-series was reared by Dr. H. Bytinski-Šalz from larvae of Lasioderma serricorne (Fabricius, 1792) (Coleoptera: Anobiidae) from safflower, Carthamus tinctorius L. Therefore, the association of I. carthami with L. serricorne and T. nigripalpis needs further studies.
Figure 1. Female of *Israelius carthami*: A. Fore wing; B. Mesosoma in dorsal view; C. Head in dorsal view.

Figure 2. Distribution map of *Israelius carthami* in the northwest of Iran.
Discussion
This report confirms association of *I. carthami* with Asteraceae. With this new record, Iranian species of the family Bethylidae reach 29 species in 14 genera. Only one species of the genus *Glesonema* has been reported from Iran that includes Sclerodemini (*Samadi-Afshar et al., 2013*), therefore, *Israelius* is the second one.

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

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زنبروی های ایران از نوع خانواده {	extit{Hym.: Bethylidae}} {	extit{Israelius carthami}} Richards، 1952 پایدار در منطقه‌ای می‌باشد.

پالنارتکی

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چکیده: گونه {	extit{Israelius carthami}} Richards، 1952 برای نخستین بار در ایران از {	extit{Cirsium congestum}} Fisch. & C.A. Mey. و {	extit{Xeranthemums quarrosum}} Boiss. و {	extit{Carthamus lanatus}} L. از تیره {	extit{Asteraceae}} در گزارش با اسامی علمی {	extit{Chrysidoidea}} و {	extit{Sclerodermini}} نشان داده شد. در پرورش‌های آزمایشگاهی، همزمان با این زنبور، یک گونه مگس میوه به نام {	extit{Terellia nigripalpis}} Hendel به نام {	extit{Tephritidae}} در {	extit{C. congestum}} نیز از روي گیاه به دست آمد. براساس اطلاعات موجود تمامی روابط میزبانی‌های گیاهان فوق با این زنبور، جدید می‌باشد و پراکنش عمومی و روابط زیستی این گونه مورد بحث قرار گرفته.

واژگان کلیدی: میزبان، پراکنش، {	extit{Chrysidoidea}}، {	extit{Sclerodermini}}