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Hesperophanes pilosus Bodungen, 1908 – A new record of longhorn beetles (Coleoptera, Cerambycidae) for Iranian fauna with the first detection of its host plant species

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ABSTRACT. The longhorn beetle, *Hesperophanes pilosus* Bodungen, 1908, (Coleoptera, Cerambycidae) is recorded as new for the Iranian fauna. The adult specimens were obtained by rearing its larvae and pupa in the root crown of *Halocnemum strobilaceum* (Pall.) Bieb. (Amaranthaceae), which were collected around of Soldoz wetland in West Azarbaijan province. *Hesperophanes pilosus* has been reported only from the Republic of Azerbaijan. This is the first case of host identification for *H. pilosus*. Notes on diagnostic characters, life history along with related photographs are provided.

Key words: longhorn beetle, new record, host association, pigweed, Iran

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INTRODUCTION

The tribe Hesperophanini Mulsant, 1839 includes 86 genera and 221 species within two subtribes as Hesperophanina Mulsant, 1839 and Daramina Sama, 2008 worldwide, 12 genera and 55 species in the Palaearctic region. Of which 5 genera and 9 species have been reported from Iran. They are including, *Hesperophanes sericeus* (Fabricius, 1787), *Jebusaea hammerschmidti* Reiche, 1878, *Trichoferus campestris* (Faldermann, 1835), *T. fasciculatus* (Faldermann, 1837), *T. fissitarsis* Sama, Fallahzadeh & Rapuzzi, 2005, *T. ivoi* Kadlec, 2005, *T. lunatus* (Szallies, 1994), *Stromatium auratum* (Böber, 1793), and *Zoodes compressus* (Fabricius, 1787) (Danilevsky & Lazarev, 2023; Tavakilian, 2023). *Hesperophanes* Dejean, 1835 is a rather small genus of longhorn beetles (Coleoptera, Cerambycidae) which includes eight species worldwide, and represents with five species distributed from Mediterranean Region, Southern Europe, to Caucasus, Iran, Central Asia, Mongolia and North-Western China (Xinjiang, Inner Mongolia) in the Palaearctic region (Danilevsky & Lazarev, 2023; Tavakilian, 2023).

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MATERIAL AND METHODS

Expeditions were conducted to find the phytophagous insects associated with *Halocnemum strobilaceum* (Pall.) Bieb in saline lands around Soldoz wetland in West Azarbaijan province of Iran (Figs 1 and 2A). In order to find the root-feeding insects, likely attacked samples of roots were collected during spring of 2019–2021. Samples were picked out from main root and crowns of host plant about 10 cm underground. Each year 15–20 samples of root were collected, and placed into the prepared glass boxes (30×40×80 cm) covered by muslin, in the entomology laboratory of the Department of Plant Protection, Faculty of Agriculture, Urmia University. The insects were reared at 27±02°C; 70±5% relative humidity and a photoperiod of 12:12 L:D. The emerging dates of the specimens were recorded daily. Collected beetles were killed and mounted for identification. The specimens were identified using the keys of Plavilstshikov (1940) and Danilevsky & Miroshnikov (1985), as well as by comparison with specimens from type locality. The voucher specimens are deposited in the collections of the Hayk Mirzayans Insect Museum, Tehran, Iran (HMIM) and of the Institute of Zoology, Scientific Center of Zoology and Hydroecology, National Academy of Sciences of Armenia.

RESULTS

Taxonomic hierarchy

Class Insecta Linnaeus, 1785

Order Coleoptera Linnaeus, 1758

Family Cerambycidae Latreille, 1802

Tribe Hesperophanini Mulsant, 1839

Genus *Hesperophanes* Dejean, 1835

***Hesperophanes pilosus* Bodungen, 1908 (Fig. 2D)**

Materials examined: 1♂, IRAN, West Azarbaijan (Azarbaijan-e Gharbi) province, saline lands around Soldoz wetland, 37°02'29"N, 45°36'53"E, 1280 m a.s.l., ex *Halocnemum strobilaceum* (Pall.) Bieb., 1819 (Amaranthaceae), collection date of plant materials, 02.V.2019, emergence date of imago 10.VI.2019; 1♀ same data, collection date of plant materials, 13.V.2020, emergence date of imago 15.VI.2019; 2♂♂, 1♀ same data, collection date of plant materials, 24.V.2021, emergence date of imagoes 16–21.VI.2020; 2♀♀ same data, 8.IIX.2021, collected from the host plant, leg. Y. Karimpour.



Figure 1. The Soldoz wetland, where the specimens were collected.



Figure 2. Habitat and life stages of *Hesperophanes pilosus* Bodungen, 1908. **A.** Landscape of in Soldoz wetland, West Azarbaijan province, Iran; **B.** Mature larva inside the root of *Halocnemum strobilaceum*; **C.** Pupa; **D.** Adult male.

Diagnosis. medium size, body length in male 15–19 mm, female 24–28 mm. Body more or less pale brown with reddish tint (Fig. 2D). Antennae in male slightly extend beyond middle of elytra, in female shorter. Pronotum with subparallel sides between anterior and posterior 1/4. Elytral surface with very dense small puncture hidden with short dense pubescence, and with numerous visible, shiny and somewhat smoothed punctures with very weakly elevated anterior edge, bearing rather long semi-standing setae. *Hesperophanes pilosus* can be easily distinguished from *H. sericeus*, the only other species

of the genus known from Iran, by the following characters: shorter antennae (in male *H. sericeus* antennae slightly extend beyond elytral apex, in female distinctly extend to the middle of elytra); pronotum in *H. sericeus* somewhat shorter than in *H. pilosus*, spheroidal, with slightly irregularly arcuate sides, elytral punctures distinctly deeper and rougher, somewhat rasp-shaped with distinctly elevated anterior edge, with much shorter recumbent setae. *Hesperophanes andresi*, recently described from Egypt and also living in roots and stems of *Halocnemum strobilaceum* differs from *H. pilosus* according to its description (Sama & Rapuzzi, 2006) by spheroidal pronotum with some discal setigerous points and shorter recumbent elytral setae.

Life cycle. We could not find any evidence to determine the required time to complete a single generation. But it appears that two years may be required to complete the life cycle. Due to our recent obtained data, it can be inferred that adult insects are active during the summer and while feeding on the soft tissues of the host plant, they mate from time to time and lay eggs singly. After hatching, the young larvae bore into the root crown of larger lateral roots and feed on its contents by creating larval corridors. Mature larvae (Fig. 2B) overwinter in the root crown. Pupation (Fig. 2C) occurs in late spring and adults gradually appear in the late spring and summer.

Distribution. Azerbaijan (Baku environs, Qaradağ region) (Bodungen, 1908; Hoskovec et al., 2022) and Iran (West Azarbaijan province, around Soldoz wetland), as the new record.

DISCUSSION

The larvae of Palearctic species, *H. sericeus* (Fabricius, 1787) develop in the tissues, dead wood of large trunks and roots of oak, *Quercus* spp. (Fagaceae), fig, *Ficus carica* L. (Moraceae), wild pistachio, *Pistacia atlantica* Desf. (Anacardiaceae), almond, *Prunus amygdalus* Batsch, 1801 (Rosaceae) and pomegranate, *Punica granatum* L. (Lythraceae) (Plavilstshikov, 1940; Svacha & Danilevsky, 1988; Modarres Awal, 1997); *H. heydeni* Baeckmann, 1923 in the root and trunk woody tissues of *Tamarix* spp. (Kostin, 1973), *H. andresi* Sama & Rapuzzi, 2006 in the roots and stems of semi-shrubs of *Halocnemum strobilaceum* Pallas (Bieb.) Amaranthaceae and *H. melonii* Fancello & Cillo, 2012 in *Arthrocnemum fruticosum* (L.) (Svacha & Danilevsky, 1988; Sama & Rapuzzi, 2006; Fancello & Cillo, 2012; Cillo, 2019). The xylophagous and polyphagous species, *Hesperophanes sericeus*, was the only known species of *Hesperophanes* from Iran, which was first reported from northern Iran by Danilevsky & Miroshnikov (1985) and then from several provinces of the country (Kohkilouye, Lorestan, Fars, Ilam, Yazds Kerman, Kermanshah, Markazi) by Modarres Awal (1997), Borumand (2004, as *Trichoferus sericeus*) and Sama et al. (2008). *Hesperophanes pilosus* is the second species of the genus found in the country that being new for the Iranian fauna.

Adult specimens of *H. pilosus* were obtained from rearing of its larvae in the crown and roots of *H. strobilaceum* (Figs 1, 2A, 2B), collected from the saline lands of Soldoz wetland together with *Sphenoptera orichalcea* (Pallas, 1781) (Kalashian et al., 2022). In this area, *H. strobilaceum* is a dominant halophytic species and often forms monodominant communities or co-occurs with *Puccinellia distans* (Jacq.) Parl. (Poaceae) and *Aeluropus* sp. (Poaceae). According to EUNIS habitats' classification (Davies et al., 2004) the habitat can be classified as Continental inland salt steppes (E6.2). According to Svacha & Danilevsky (1988), the larvae of *Hesperophanes pilosus* Bodungen, 1908 occurs in roots of Amaranthaceae species, the plant species, *Halocnemum strobilaceum* (Pall.) Bieb. (Amaranthaceae), is determined for the first time as a host plant of the species, *Hesperophanes pilosus* Bodungen, 1908, with the present study. Also, based on the present findings, *H. strobilaceum* is the host plant species for two species of *Hesperophanes* longhorn beetles.

AUTHOR'S CONTRIBUTION

The authors confirm their contribution in the paper as follows: M. Kalashian: Identification, and drafting; Y. Karimpour: Field work, photographing, writing and revising the manuscript; M. Davodi: Field works and sampling. The authors read and approved the final version of the manuscript.

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AVAILABILITY OF DATA AND MATERIAL

The specimens listed in this study are deposited in Hayk Mirzayans Insect Museum, Tehran, Iran (HMIM) and are available from the curator, upon request.

ETHICS APPROVAL AND CONSENT TO PARTICIPATE

Not applicable.

CONSENT FOR PUBLICATION

Not applicable.

CONFLICT OF INTERESTS

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

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گزارش جدید *Hesperophanes pilosus* Bodungen, 1908 برای فون سوسک‌های شاخک بلند (Coleoptera, Cerambycidae) ایران و معرفی گیاه میزبان

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چکیده: سوسک شاخک‌بلند *Hesperophanes pilosus* Bodungen, 1908 (Coleoptera, Cerambycidae) برای اولین بار به عنوان یک گونه جدید برای فون سوسک‌های شاخک‌بلند ایران گزارش می‌شود. حشرات کامل این سوسک از پرورش لارو و شفیره‌های آن در درون ریشه‌های اصلی گیاه شور باتلاقی (*Halocnemum strobilaceum* (Pall.) Bieb. از خانواده *Amaranthaceae* به دست آمدند. ریشه‌های آلوده شورباتلاقی از اطراف تالاب سولدوز در آذربایجان غربی جمع‌آوری شدند. این گونه تنها از کشور جمهوری آذربایجان گزارش شده است. این اولین مورد از معرفی گیاه میزبان برای سوسک شاخک بلند فوق می‌باشد. نکاتی درباره ویژگی‌های زیستی و شکل‌شناسی این گونه به همراه تصاویر مربوطه ارائه شد.

واژگان کلیدی: سوسک شاخک‌بلند، گزارش جدید، روابط میزبانی، شورباتلاقی، ایران.