

RESEARCH ARTICLE

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A rare species, *Rhiza stenoptera* (Boursin, 1970) new record from Iran with a catalogue of *Pseudohadenina* Ronkay & Fibiger, 2007 of Iran

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Abstract

Based on the examination of the materials collected by LED light trap in 2021, from south of Iran (Kerman province), a rare moth species belonging to Xyleninae subfamily (Lepidoptera, Noctuidae), *Rhiza stenoptera* (Boursin), is newly recorded for the country. The external and the genital characters of this species are presented and compared with its close relatives, *R. schlumbergeri* (Püngeler), collected from Sistan-va-Balouchestan province, Iran and *R. commoda*, a widely distributed species in the Palearctic region. Notes on the bionomic and distribution of *R. stenoptera* are given. The taxonomic position of *Pseudohadena* Alphéraky, s. l. has been changed through the time with the increase of the materials described mainly collected from Central Asia which was resulted in erecting the *Pseudohadenina* Ronkay & Fibiger, 2007. An inclusive catalogue of *Pseudohadenina* of Iran is presented. Beside the citation of first description, the distribution range of the members of this subtribe is given worldwide.

Key words: catalogue, Iran, new record, *Pseudohadenina*, *Rhiza*.

INTRODUCTION

The subtribe *Pseudohadenina* Ronkay & Fibiger, 2007 belongs to tribe Xylenini Guenée, 1837 and subfamily Xyleninae Guenée, 1837. This subtribe comprises eight genera including *Pseudohadena* Alphéraky, 1889; *Rezahiria* G. Ronkay, Ronkay & Gyulai, 2014; *Rhiza* Staudinger, 1889; *Eremohadena* Ronkay, Varga & Fábíán, 1995; *Orohadena* Ronkay, Varga & Gyulai, 2002; *Scotocampa* Staudinger, 1888; *Lanatomyga* Gyulai & Ronkay, 2002 and *Palaeagrotis*, Hampson, 1907.

Since 1989, the taxonomic position and rank of different lineages of the genus *Pseudohadena* s. l. has been undergone massive and rapid changes with finding and describing new species mainly by Hungarian lepidopterists (e.g.: Ronkay & Varga, 1989; Yela & Ronkay, 1992; Ronkay & Varga, 1993; Ronkay *et al.*, 1995; Ronkay *et al.*, 2002). The first revised checklist of *Pseudohadena* and its species groups was published, based upon on the external and genital features, as a result of a revisional study by Ronkay and Varga, 1993 introducing 11 species-group for this genus. Having studied the materials from Central Asia, Ronkay *et al.* (1995) re-revised the genus *Pseudohadena* s. str. and introduced three subgenera: *Pseudohadena* Alphéraky, 1889; *Pseudopseustis* Hampson, 1910 and *Jaxartia* Püngeler, 1914. Splitting the formerly genus *Pseudohadena*, they also erected two new genera, *Eremohadena* for the *siri*-group and *Graphantha* Ronkay, Varga & Fábíán, 1995 for the *laciniosa*- and the *commoda*-groups.

In a phylogenetically attempt to evaluate the supra-specific characters of *Pseudohadena* and its related genera, Ronkay *et al.* (2002) revised the groups of this generic group and re-evaluated the taxonomical ranking of the supra-specific taxa. They established *Orohadena* as a new genus and

Megahadena Ronkay, Varga & Gyulai, 2002 and *Bryohadena* Ronkay, Varga & Gyulai, 2002 as two new subgenera for *Eremohadena* and *Orohadena* respectively.

In order to remain the genus *Pseudohadena* as a monophyletic group, *Eremohadena* and *Graphantha* were downgraded to the subgenera of *Pseudohadena* by Fibiger and Hacker (2005). The next and so far stable phylogenetic study on this generic group was presented by Fibiger and Hacker (2007) establishing Pseudohadenina as a new subtribe that together with Antitypina Forbes & Franclemont, 1954 and Xylenina Guenée, 1837 form a large monophyletic group within tribe Xylenini Guenée, 1837. They presented a correction on Ronkay *et al.* (1995) and replaced the genus *Rhiza* for *Rhiza commoda* Staudinger, 1889. They upgraded *Eremohadena* to the genus level and erected *Iberihadena* Fibiger & Ronkay, 2007 as its new subgenus. The Central Asian genus, *Palaeagrotis* Hampson, 1907 was later added to Pseudohadenina by Volynkin (2012) and the eighth Pseudohadenina genus *Rezahiria* from Iran was established by Ronkay *et al.* (2014).

The Eurasiatic genus *Rhiza* comprises three subgenera *Rhiza*, *Gryphadena* and *Graphantha* with eremic, univoltine species. This genus is represented in Iran by five species; *Rhiza commoda* Staudinger, 1889, *Rhiza schlumbergeri* (Püngeler, 1905), *Rhiza stenoptera* (Boursin, 1970), *Gryphadena minuta sengana* (Brandt, 1941) and *Graphantha laciniosa* (Christoph, 1887). The present paper contains the report of a rare species of the genus *Rhiza*, *R. stenoptera*, from south of Iran, Kerman province. In addition, the catalogue of Pseudohadenina of Iran is presented.

MATERIAL AND METHODS

This study is based on the examination of the materials collected by LED light trap (with 24 UV, one blue, one green and one white LEDs arranged on a three-dimension structure, powered by 12-V batteries) in May, 2021 from Sirch Mountains, southeastern of Kerman (Iran) and the materials deposited in the collection of Noctuidae, Shahid Bahonar University of Kerman (Kerman) as well. The genitalia slide of the specimens were prepared following Fibiger (1990). The specimens were photographed by a Canon digital camera (Power Shot A710) and the photographs of the genitalia were taken by an Olympus SZH stereo-microscope with an Omax (18Mp) A35180U3 digital camera.

RESULTS

Subtribus Pseudohadenina Ronkay & Fibiger, 2007

Type genus: *Pseudohadena* Alphéraky, 1889

Genus *Pseudohadena* Alphéraky, 1889

Type species: *Hadena armata* Alphéraky, 1887

Subgenus *Jaxartia* Püngeler, 1914

Type species: *Hadena armata* Alphéraky, 1887

evanida species-group

Pseudohadena zahedana Shirvani & Ronkay, 2008

Pseudohadena zahedana Shirvani & Ronkay, 2008, *Esperiana* 14: 578. L. t.: Iran, Sistan-va-Balouchestan.

Distribution: Iran (Sistan-va-Balouchestan).

Pseudohadena magnitudinis Hacker & Ebert, 2002

Pseudohadena magnitudinis Hacker & Ebert, 2002, *Esperiana* 9: 256. L. t.: Iran, Esfahan.

Distribution: Iran (Esfahan).

Pseudohadena pseudamoena Boursin, 1943

Pseudopseustis pseudamoena Boursin, 1943, *Revue France de Ent.*10: 81. L. t.: Armenia, Julfa.

Distribution: Armenia, Iran (Golestan, Khorasan-e-Shomali (Wieser & Stangelmaier, 2005)).

Genus *Rezahiria* G. Ronkay, Ronkay & Gyulai, 2014

Type species: *Rezahiria marmota* G. Ronkay, Ronkay & Gyulai, 2014

Rezahiria marmota G. Ronkay, Ronkay & Gyulai, 2014

Distribution: Iran (Esfahan (Ronkay et al., 2014)).

Genus *Rhiza* Staudinger, 1889

Type species: *Rhiza commoda* Staudinger, 1889

syn.: *Dysgraphhadena* L. Ronkay, Varga & Fábíán, 1995

Subgenus *Rhiza* Staudinger, 1889

Type species: *Rhiza commoda* Staudinger, 1889

***Rhiza commoda* Staudinger, 1889**

Rhiza commoda Staudinger, 1889, *Stettiner Entomologische Zeitung* 50: 44. L. t.: Kyrgyzstan, Issyk-Kul.

syn.: *manifesta* Christoph, 1893

Distribution: Armenia, Turkey, Kyrgyzstan, Tajikistan, Kazakhstan, Turkmenistan, Afghanistan, Pakistan, southern Siberia, Mongolia (Fibiger & Hacker, 2007), Iran (Khorasan-e-Shomali (Gulteb & Wieser, 2002)).

***Rhiza schlumbergeri* (Püngeler, 1905)**

Pseudohadena schlumbergeri Püngeler, 1905, *Deutsche Entomologische Zeitschrift Iris* 17 (2): 265. L. t.: Kazakhstan, Zharkent.

Distribution: Kazakhstan, Turkmenistan, Tadjikistan, western China (Fibiger & Hacker, 2007), Iran (Sistan-va-Balouchestan).

***Rhiza stenoptera* (Boursin, 1970)**

Pseudohadena stenoptera Boursin, 1970, *Entomops* 18: 65, L. t.: Russia: Uralsk, Emba.

Distribution: Kazakhstan, Russia (Fibiger & Hacker, 2007), Iran (first record).

Subgenus *Gryphadena* Kusnezov, 1908

Type species: *Pseudohadena minuta* Püngeler, 1899

***Rhiza minuta sengana* (Brandt, 1941)**

Pseudohadena sengana Brandt, 1941, *Mitteilungen der Munchner Entomologischen Gesellschaft* 31: 843.

L.t.: Iran, Sistan-va-Balouchestan.

Distribution: Iran (Sistan-va-Balouchestan (type locality), Kerman).

Subgenus *Graphantha* Ronkay, Varga & Fábíán, 1995

Type species: *Chloantha laciniosa* Christoph, 1887.

laciniosa species-group

***Rhiza laciniosa* (Christoph, 1887)**

Chloantha laciniosa Christoph, 1887, In: *Romanoff Mémoires sur les Lépidoptères* 3: 77. L.t.: Turkmenistan, Ashabad, Germob.

Distribution: Turkmenistan, Afghanistan (Shirvani et al., 2008), Iran (Kerman (Shirvani et al., 2008), Khorasan (Koçak & Kemal, 2014), Khorasan-e-Jonobi (Shahreyari-Nejad, et al., 2018), Khorasan-e-Shomali (Gulteb & Wieser, 2002)).

Genus *Eremohadena* Ronkay, Varga & Fábíán, 1995

Type species: *Mamestra siri* Ershov, 1874

Subgenus *Eremohadena* Ronkay, Varga & Fábíán, 1995

Type species: *Mamestra siri* Ershov, 1874

coluteae species-group

***Eremohadena coluteae coluteae* (Bienert, 1869)**

Luperina coluteae Bienert, 1869, *Lep. Ergebnisse Reise in Persien in den Jahren 1858 und 1859*, 35, L.t.: Iran.

syn.: *arvicola* (Christoph, 1887)

Distribution: Pakistan, Kyrgyzstan (Ronkay & Varga, 1993), Iran (Mazandaran (Ebert & Hacker, 2002), Khorasan-e-Shomali, Golestan (Gulteb & Wieser, 2002), Sistan-va-Balouchestan).

***Eremohadena coluteae banghaasi* (Bytinsky-Salz & Brandt, 1937)**

Pseudohadena banghaasi Bytinsky-Salz & Brandt, 1937, *The Entomologist's Record and Journal of Variation*:49: 9, L.t.: Iran.

Distribution: Iran (Tehran (Bytinsky-Salz & Brandt, 1937)).

siri species-group

***Eremohadena siri* (Ershov, 1874)**

Mamestra siri Ershov, 1874, *In Fedtschenko, Reise in Turkestan*: 41. L. t.: Turkestan, Kisilkum.

Distribution: Uzbekistan, Iran (Khorasan, Mazandaran (Gulteb & Wieser, 2002)).

***Eremohadena roseotinctoides* (Poole, 1989)**

Pseudohadena roseotinctoides Poole, 1989, *Lepidopterorum Catalogus* 118 (2): 849. L. t.: Iran, Sistan-va-Balouchestan.

syn.: *roseotincta* (Brandt, 1941) (preoccupied)

Distribution: Iran (Tehran, Mazandaran, Sistan-va-Balouchestan, Kerman (Ebert & Hacker 2002)).

chenopodiphaga species-group

***Eremohadena chenopodiphaga chenopodiphaga* (Rambur, 1832)**

Mamestra chenopodiphaga Rambur, 1832, *Annales de Société Entomologique de France* 1832: 283, L. t.: France, Corsica.

syn.: *erubescens* Staudinger, 1901; *roseotincta* Turati, 1929

Distribution: This species is widespread from the Maghreb countries to Mongolia (Fibiger & Hacker, 2007), Iran (Tehran, Fars (Brandt, 1938)).

***Eremohadena afzalipouri* Shirvani, 2012**

Eremohadena afzalipouri Shirvani, 2012, *Journal of Insect Science* 12: 137. L. t.: Iran, Kerman.

Distribution: Iran (Kerman (Shirvani *et al.*, 2012)).

pexa species-group

***Eremohadena toerpexa* Ronkay & Gyulai, 2006**

Eremohadena toerpexa Ronkay & Gyulai, 2006, *Esperiana* 12: 218, L. t.: Iran, Khorasan.

Distribution: Iran (Khorasan-e-Shomali (Ronkay & Gyulai 2006)).

Subgenus *Iberihadena* Fibiger and Ronkay, 2007

Type species: *Pseudohadena mariana* E. de Lajonqui re, 1964

***Eremohadena immunis* (Staudinger, 1889)**

Luperina immunis Staudinger, 1889, *Stettiner Entomologische Zeitung* 50: 40, L. t.: Kirghizstan.

Distribution: Kirghizstan, Iran (Khorasan-e-Shomali, Golestan (Gulteb & Wieser, 2002)).

Subgenus *Megahadena* Ronkay, Varga and Gyulai, 2002

Type species: *Pseudohadena megaptera* Boursin, 1970

***Eremohadena rjabovi* (Boursin, 1970)**

Pseudohadena rjabovi Boursin, 1970, *Entomops Nice* 18: 66, L. t.: Iran. Armenia.

Distribution: Armenia (Boursin, 1970), Iran (Tehran, Alborz, Fars (Boursin, 1970), Qom (Ebert & Hacker 2002)).

***Eremohadena megaptera* (Boursin, 1970)**

Pseudohadena megaptera Boursin, 1970, *Entomops Nice* 18: 69, L. t.: Iran

Distribution: Afghanistan (Boursin, 1970), Iran (Mazandaran (Boursin, 1970)).

***Rhiza stenoptera* (Boursin, 1970)**

Pseudohadena stenoptera Boursin, 1970, *Entomops* 18: 65, L. t.: Russia: Uralsk, Emba.

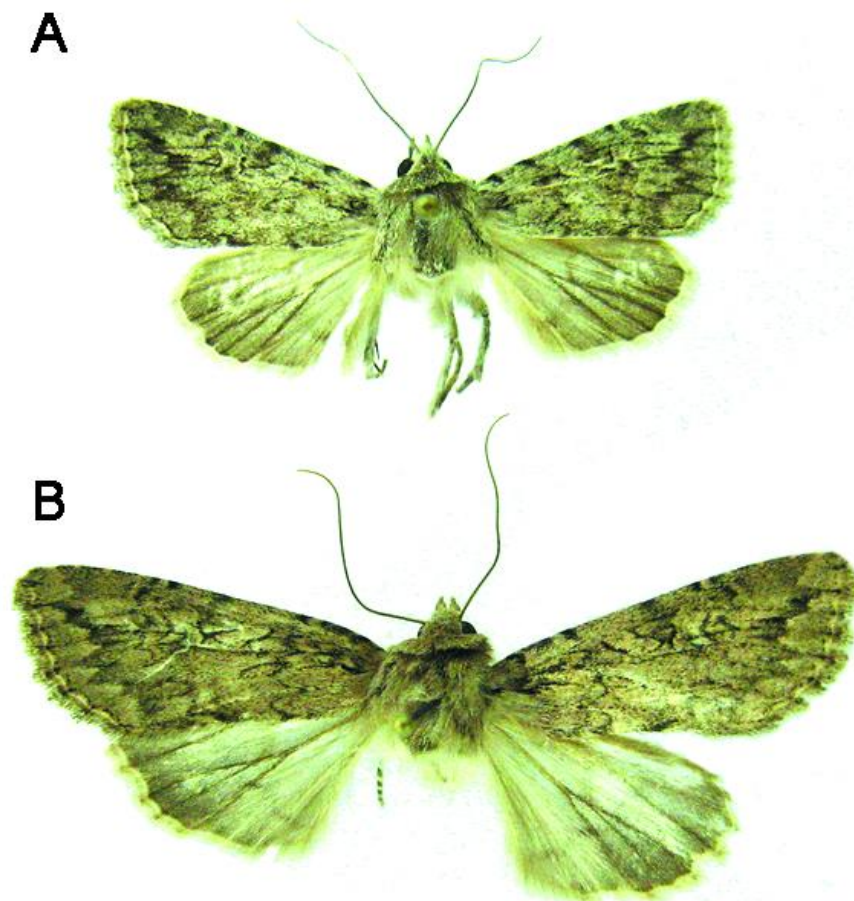


FIGURE 1. *Rhiza* spp., adults. A. *R. schlumbergeri* female, Iran, Sistan & Balouchestan, Taftan; B. *R. stenoptera* female, Iran, Kerman, Sirch., Elburz Mountains. Afghanistan, Iran.

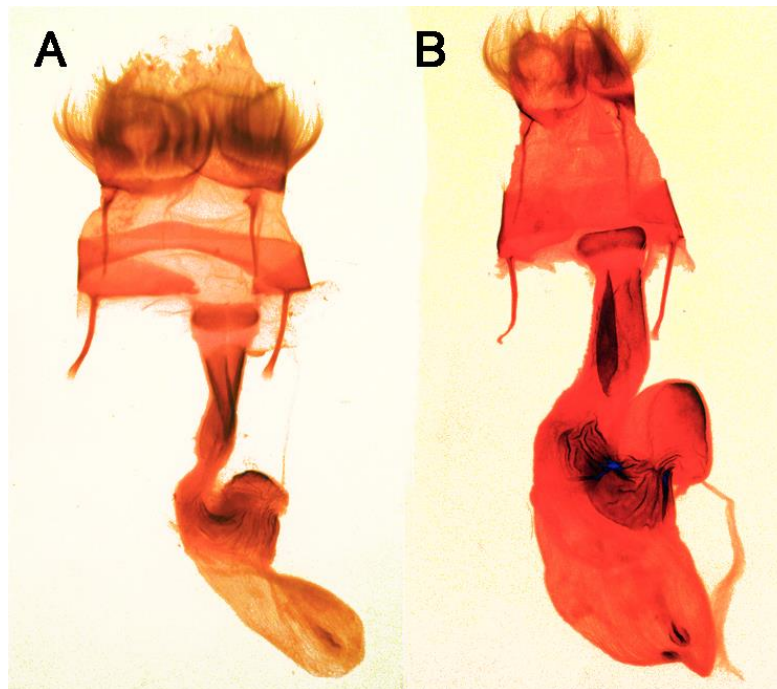


FIGURE 2. *Rhiza* spp., female genitalia. A. *R. schlumbergeri* Iran, Sistan & Balouchestan, Taftan; B. *R. stenoptera* Iran, Kerman, Sirch



FIGURE 3. Habitat of *R. stenoptera* Iran, Kerman, Sirch, S. Tunnel, 2681 m., 30°8'30''N 57°23'57''E, 25. May.2021.

Diagnosis: *R. stenoptera* differs from its close relative, *R. schlumbergeri* (figs. 1 A and 2 A), by its larger size, longer and less triangular forewing and in the female genitalia by the longer ovipositor, thinner and more sclerotized ostium bursae and shorter and thicker ductus bursae. The forewing ground color of *R. stenoptera* is pinkish light brown while that of *R. schlumbergeri* is olive light brown. The main difference, in the male genitalia, between these two species is the fully coiled vesica of *R. stenoptera* compared to the recurved vesica of *R. schlumbergeri*. Compared to *R. commoda*, *R. stenoptera* has larger

and narrower forewings, narrower ampulla, heavily sclerotized ostium bursae and fully coiled vesica. The differences among *R. stenoptera*, *R. schlumbergeri* and *R. commoda* are fully discussed by Fibiger and Hacker (2007).

Identification (fig. 1 B): female, wingspan 40 mm, forewing narrow. Antennae filiform, head small, eyes large, globular, palpi porrect, ventrally with long tufts. Head, collar, tegulae and forewing ground color light brown, that of wings softly pinkish. Forewing crosslines narrow, black basal dash present, noctuid maculation present, all outlined by dark brown, orbicular stigma doubled, fringes light brown. Hindwing light brown, basal two-third whitish, subterminal line fine, fringes white. Underside of forewing grey, that of hindwing whitish, subterminal line of both wings distinct.

Female genitalia (fig. 2 B). Ovipositor longer than wide, long apical setae present, gonapophyses slender, posterior apophyses longer than anterior ones. Ostium bursa narrow, rectangular, heavily sclerotized, ductus bursa short, posterior two-third heavily sclerotized, anteriorly rugulose, smoothly sclerotized. Corpus bursae ovoid, membranous, two short signum-bands present, appendix bursae short, ovoid-globular, heavily sclerotized, strongly rugulose basally.

Bionomics and distribution: This species was collected by a light trap in the foothills of a mountainous region. The plant coverage of its habitat (fig. 3) is constituted mainly by the bushes of *Artemisia* and scarcely by *Astragalus* species. The early stages and the larval food plants are unknown as yet. This species was previously reported from Kazakhstan, Russia (Boursin, 1970; Fibiger & Hacker, 2007).

Material examined: 1♀, Iran, Prov. Kerman, Sirch, S. Tunnel, 2681 m., 30°8'30"N 57°23'57"E, 25. May.2021, leg. Asghar Shirvani.

DISCUSSION

About 80 species and subspecies of Pseudohadenina are listed from Palearctic region. This subtribe is represented in Iran by 19 taxa (25% of all described taxa), of those, one genus (*Rezahiria*) and 10 species and subspecies have Iranian type locality. These eremic species have evolved in the desert, semi-desert and xeromontane biomes of Anatolia, Asia Minor, Central Asia and part of Himalaya (Fibiger and Hacker 2007).

Five members out of 18 *Rhiza* Palearctic taxa belonging to three subgenera (*Rhiza*, *Gryphadena* and *Graphantha*) are present in Iran, of those, *R. minuta sengana* has Iranian type locality. These species inhabit desert, semi-deserts and dry montane slopes. The distribution range of nominate *R. commoda* (Transcaucasia, Anatolia, Central Asia, and Himalaya) is the largest among the subgenus *Rhiza*, while *R. schlumbergeri* is distributed locally from Kazakhstan to west China eastward and to Iran southward. In contrast to the wide distribution range of *R. commoda*, *R. stenoptera* is restricted to the type locality (Uralsk), Kazakhstan and xerothermic rocky slopes of mountains in south of Iran. *R. laciniosa* populates arid biotopes of Turkmenistan, Afghanistan and Iran. The range of species is from northeast to southeast of Iran stretching from Khorasan-e-Jonobi to Kerman and Sistan-va-Balouchestan. Another Iranian species with local distribution range is *R. minuta sengana* reported from semi-desert habitats.

The biology of these univoltine species is poorly known. The early stages and the larval food-plants are unknown as yet. The information on their bionomics is restricted to the flight behavior that is, long summer diapause for the species inhabiting lower altitudes and active adults throughout the summer (Fibiger & Hacker, 2007) for those in high altitudes. The deficiency of information on the biology of this taxa, as well as most other noctuid moths, must be compensated by regulating expansive faunistic investigations in their habitats.

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