

Contribution to the noctuid fauna of NE Iran: Noctuinae, Hadeninae and Plusiinae (Lepidoptera), with additions to the Iranian fauna

Mohammad Mahdi Rabieh, Ali Asghar Seraj & Mehdi Esfandiari

Abstract. A faunistic study on the family Noctuidae was carried out in the Khorasan-e-Razavi province, Northeastern Iran in 2010 and 2011. A total of 64 species of the subfamilies Noctuinae, Hadeninae and Plusiinae belonging to 25 genera were collected. Among them three species and one subspecies are reported for the first time from Iran: *Noctua fimbriata* (Schreber, 1795), *Euxoa sayvana* Varga & Ronkay, 1998, *Eicomorpha firyuza* Ronkay, Varga & Hreblay, 1998 and *Hadena compta armeriae* (Guenée, 1852). For these species, illustrations of adults and their genitalia are given with notes on the bionomy and distribution. Also, 21 species and subspecies were recorded for the first time from Khorasan-e-Razavi province. A list of the collected species is presented.

Samenvatting. Bijdrage tot de studie van de Noctuidae-fauna van Noordoost-Iran: Noctuinae, Hadeninae en Plusiinae (Lepidoptera), met nieuwe soorten voor de Iraanse fauna

In de provincie Khorasan-e-Razavi, Noordoost-Iran, werd een faunistische studie van de Noctuidae uitgevoerd in 2010 en 2011. In het totaal werden 64 soorten uit de subfamilies Noctuinae, Hadeninae en Plusiinae verzameld, behorend tot 25 genera. Drie soorten en één ondersoort worden voor het eerst uit Iran vermeld: *Noctua fimbriata* (Schreber, 1795), *Euxoa sayvana* Varga & Ronkay, 1998, *Eicomorpha firyuza* Ronkay, Varga & Hreblay, 1998 en *Hadena compta armeriae* (Guenée, 1852). Van deze taxa worden de adulten en genitalia afgebeeld en informatie over de bionomie en verspreiding gegeven. Eenentwintig soorten en ondersoorten worden voor het eerst uit de provincie Khorasan-e-Razavi vermeld. Een lijst van alle verzamelde soorten wordt bijgevoegd.

Résumé. Contribution à l'étude de la faune des noctuelles de l'Iran N.-E.: Noctuinae, Hadeninae et Plusiinae (Lepidoptera), et quelques espèces nouvelles pour l'Iran

Une étude faunistique de la famille des Noctuidae fut entreprise dans la province de Khorasan-e-Razavi, dans le nord-est de l'Iran en 2010 et 2011. Au total 64 espèces appartenant aux sous-familles Noctuinae, Hadeninae et Plusiinae furent observées. Trois espèces et une sous-espèce sont mentionnées ici pour la première fois de l'Iran: *Noctua fimbriata* (Schreber, 1795), *Euxoa sayvana* Varga & Ronkay, 1998, *Eicomorpha firyuza* Ronkay, Varga & Hreblay, 1998 et *Hadena compta armeriae* (Guenée, 1852). Ces taxa et leurs genitalia sont figurés et des informations sur leur bionomie et leur répartition sont données. Vingt-et-une espèces et sous-espèces sont mentionnées pour la première fois de la province de Khorasan-e-Razavi. Une liste de toutes les espèces observées est ajoutée.

Key words: Noctuinae – Hadeninae – Plusiinae – Noctuidae – fauna – Khorasan-e-Razavi – Iran.

Rabieh M. M.*, Seraj A. A. & Esfandiari M.: Department of Plant Protection, College of Agriculture, Shahid Chamran University of Ahvaz, Ahvaz, Iran.

*Corresponding author email: m.mahdi_rabie@yahoo.com

Introduction

Until now, about 1170 species of the family Noctuidae s.l. have been recorded from Iran. Recently, exploration of the Iranian noctuid fauna has become more intensive, due to several projects conducted by Iranian researchers along with foreign lepidopterologists' expeditions. These projects on the Iranian Noctuidae s.l. have resulted in the description of new species or reports of new records (see e.g. Zahiri & Fibiger 2006, Zahiri & Fibiger 2008, Shirvani *et al.* 2008, Esfandiari *et al.* 2010, Esfandiari *et al.* 2011).

The Khorasan-e-Razavi province in North-East Iran is situated between Khorasan-e-Shomali (North Khorasan) and Khorasan-e-Jonoubi (South Khorasan), and surrounded by the Semnan and Yazd provinces in the west, and the countries Turkmenistan and Afghanistan in the east. Mashhad County (ca. 992–1184 m above sea level) is the center of this province. Great Khorasan province (including Khorasan-e-Razavi, Khorasan-e-Shomali and Khorasan-e-Jonoubi) is believed to be a transitional province included in the Irano-Turanian

subregion of the Saharo-Gobian biogeographic region of the Palaearctic realm. Khorasan-e-Razavi province has two mountain ranges: Kopet-Dagh, in the North-East of the province and Binaloud, in the center of the province and some mountains scattered in central and southern parts as well. The province also has a part of the desert called "Dasht-e Kavir" in the South-West. The weather is changeable across the province: the temperature increases from north to south, but annual rainfall decreases in this respect. The presence of these different types of habitat promises a rich fauna of insects especially for the family Noctuidae s.l. The most prominent characteristics of the Khorasan flora and fauna are the presence of a large number of European, European-Mediterranean, and East Mediterranean species, and the combination of these elements with those of the Turanian region (the desert or eremic element of Middle Asian deserts) (Fet 1994). According to Heshmati (2007) a variety of fruit trees, medicinal, industrial, and edible plants is found in the mountain ecoregions of this zone. The plant species of these regions are: *Amigdallus* spp., *Onobrychis cornuta*

(Linnaeus, 1763), *Acantholimon* spp., *Astragalus* spp., *Artemisia* spp., *Alleum* spp., *Bromus* spp.

Based on our recent expeditions, we report three noctuid species, *Noctua fimbriata* (Schreber, 1795), *Euxoa sayvana* Varga & Ronkay, 1998, *Eicomorpha firyuza* Ronkay, Varga & Hreblay, 1998, and a subspecies, *Hadena compta armeriae* (Guenée, 1852) as new for the fauna of Iran. Illustrations of adult males and their genitalia (except *E. sayvana* of which we only caught a female) are given for these species. A list of 64 collected species belonging to Noctuidae, Hadeninae and Plusiinae is also presented. Species denoted with an asterisk (*) are recorded for the first time from the Khorasan-e-Razavi province, NE Iran. Results on *Eugnorisma* spp. and some *Chersotis* spp. (Noctuidae) were published recently (Rabieh *et al.* 2013a, b) and will not be treated here. A new species, *Anagrorisma chamrani* Gyulai Rabieh & Ronkay, has been also discovered during our expeditions and described by Gyulai *et al.* (2013).

Material and Methods

Collecting was carried out, once a week on the average, in the sampling localities during 2010–2011. Specimens were collected from Khorasan-e-Razavi province in North-East Iran (Fig. 1a). Sampling localities (Fig. 1b) were selected to cover different types of habitats across the province.

Sampling programs were carried out by using a generator driven mercury-vapour (MV) lamp (150 W) which was placed inside a white tent about 1.8 m high and/or a 8 W UVB tube light. Genitalia of the specimens were prepared for study according to Fibiger (1997) with some modifications. The specimens and slides of their genitalia were deposited in the Insect and Mite Collection of Ahvaz (IMCA), Plant Protection Department, Shahid Chamran University of Ahvaz, Ahvaz, Iran, except some which were deposited to P. Gyulai's private collection (Hungary) and this is mentioned in the text. Systematics and nomenclature are according to Lödl *et al.* (2012). Locality numbers (based on Fig.1b legend) are mentioned in parenthesis in the material examined.

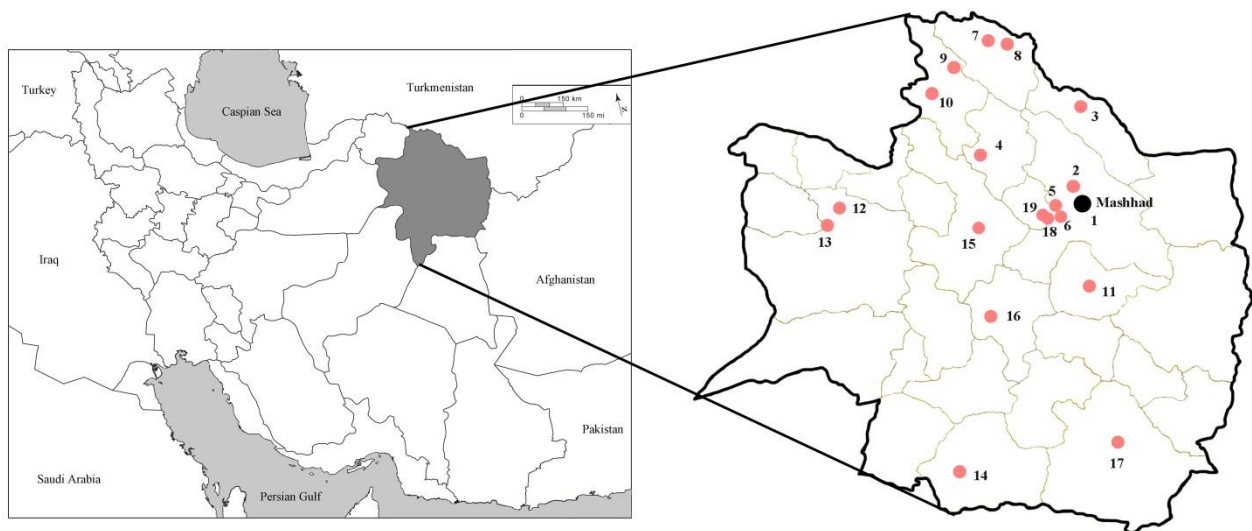


Fig. 1a. Map of the study area showing the position of the Khorasan-e-Razavi province in NE Iran (black area). 1b. Map of the Khorasan-e-Razavi province of Iran showing sampling localities; (1) Imam Reza Holy shrine: 974 m, 36°17'21"N 59°36'48"E; (2) Toos area: 1030 m, 36°29'58"N 59°31'11"E; (3) Kalat-e-Nader city: 1087 m, 36°58'48" N 59°44'46"E; (4) Akhlamad mountains: 1550 m, 36°35'52"N 58°55'07"E; (5) Binaloud mountains: 1558 m, 36°25'56"N 59°09'41"E; (6) Binaloud mountains: 1560 m, 36°09'03"N 59°27'20"E; (7) Chelmir: 1024 m, 37°23'34"N 58°51'22"E; (8) Dargaz city: 479 m, 37°26'N 59°06'E; (9) Ghuchan mountains: 1675 m, 37°14'52"N 58°28'37"E; (10) Ghuchan city: 1350 m, 37°06'N 58°30'E; (11) Fariman city: 1407 m, 35°43'56"N 54°41'01"E; (12) Sabzevar city: 950 m, 36°12'N 57°40'E; (13) Shirahmad: 985 m 36°07'09"N 57°51'08"E; (14) Gonabad city: 1706 m, 34°07'49"N 58°37'57"E; (15) Neyshabour city: 1250 m, 36°08'37"N 59°02'00"E; (16) Torbat-e-Heydariyeh: 1130 m, 35°13'30"N 59°10'17"E; (17) Khaf city: 1034 m, 34°33'17"N 60°07'57"E; (18) Binaloud mountains: 3100 m, 36°16'00"N 59°04'29"E; (19) Binaloud mountains: 3135 m, 36°16'00"N 59°04'18"E.

Results

List of species

Subfamily Plusiinae Boisduval, 1829

Abrostola clarissa (Staudinger, 1900); material examined: (4): 3♂, 01.ix.2011.

Trichoplusia ni (Hübner, 1803); material examined: (5): 1♂, 1♀, 29.vii.2010; 1♂, 27.v.2011; (11): 1♂, 3♀, 5.x.2010; (16): 1♀, 12.vii.2010; (17): 2♀, 22.vi.2010; (2): 12♂, 9♀, 11.vii.2010–27.vi.2011; (15): 1♂, 3♀, 11.ix.2010; (1): 4♂, 5♀, 12.v.2011–20.viii.2011.

Chrysodeixis chalcites (Esper, 1789) *; material examined: (11): 1♀, 5.x.2010; (2): 1♂ on 11.vii.2010 and 1♀ on 27.vi.2011; (16): 1♀, 12.vii.2010.

Note: This species was reported by Zahiri & Fibiger (2008) from various parts of Iran except from NE Iran. The larva is polyphagous on various herbivorous plants and in the Levante it is a pest of vegetables, garden flowers, coffee plants, cotton, and tomato fruits, and also observed on the leaves of an *Ulmus* tree (Kravchenko *et al.* 2007). Most of these plants can be found in the Khorasan-e-Razavi province.

Macdunnoughia confusa (Stephens, 1850); material examined: (2): 2♂, 2♀, 11.vii.2010–27.vi.2011; (16): 1♀, 12.vii.2010.

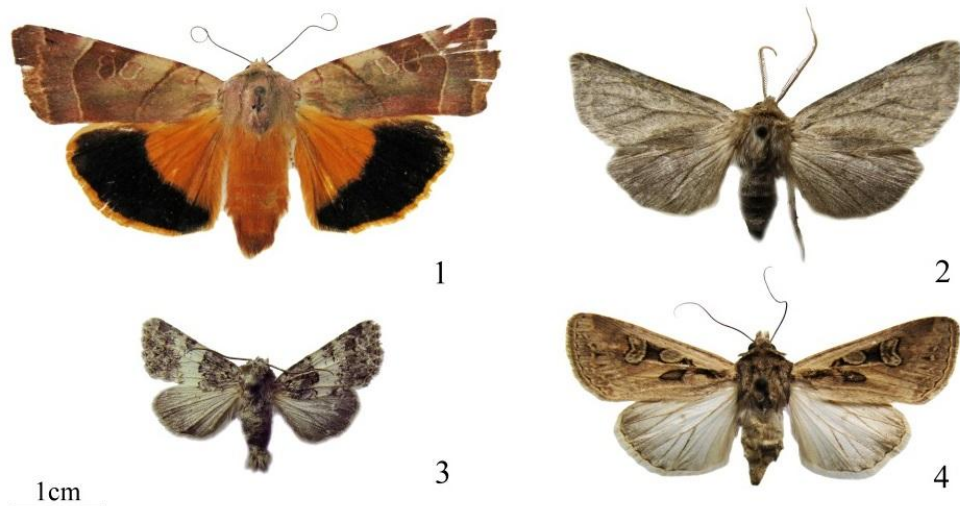


Fig. 2. Adults of new records for Iran:

- 1.– *Noctua fimbriata* (Schreber, 1795), ♂;
- 2.– *Eicomorpha firyuza* Ronkay, Varga & Hreblay, 1998, ♂;
- 3.– *Hadena compta armeriae* (Guenée, 1852), ♂;
- 4.– *Euxoa sayvana* Varga & Ronkay, 1998, ♀.

Subfamily Hadeninae Guenée, 1837

Tholera hylaris (Staudinger, 1901); material examined. (9): 1♀, 07.ix.2010.

Note: This species is an autumnal species and some of the imagines can also be found at the beginning of the winter in Europe (Hacker *et al.* 2002). We found it in early September.

Hadula dianthi (Tauscher, 1809); material examined. (9): 5♂, 07.ix.2010.

H. trifolii (Hufnagel, 1766); material examined. (5): 3♂, 2♀, 27.v.2011; (16): 2♂, 3♀, 12.vii.2010; (17): 1♂, 2♀, 22.vi.2010; (2): 38♂, 43♀, 11.vii.2010–27.vi.2011; (15): 3♂, 2♀, 11.ix.2010; (1): 2♂, 3♀, 12.v.2011–20.viii.2011; (13): 3♂, 2♀, 02.v.2011.

Lacanobia oleracea (Linnaeus, 1758); material examined.: (5): 2♂, 27.v.2011; (1): 1♂, 12.v.2011; (17): 1♀, 22.vi.2010; (15): 1♂, 11.ix.2010.

Conisania literata (Fischer de Waldheim, 1840) *; material examined. (7): 1♂, 10.v.2011. (coll. P. Gyulai).

Note: Previously, this species was only reported from parts of North Iran. The early stages and their food plants are unknown in Iran and elsewhere (Hacker *et al.* 2002).

Autographa gamma (Linnaeus, 1758); material examined: (5): 1♂, 27.v.2011; (2): 1♂, 3♀, 11.vii.2010–27.vi.2011; (15): 1♂, 1♀, 11.ix.2010; (1): 1♂, 12.v.2011; 1♀, 20.viii.2011.

Cornutiplusia circumflexa (Linnaeus, 1767); material examined: (5): 1♂, 1♀, 27.v.2011; (17): 1♂, 2♀, 22.vi.2010; (2): 3♂, 2♀, 11.vii.2010–27.vi.2011; (15): 2♀, 11.ix.2010; (1): 3♂, 4♀, 12.v.2011–20.viii.2011.

Hecatera dysodea (Denis & Schiffermüller, 1775) (= *faraulti* Rothschild, 1914); material examined. (4): 1♂, 01.ix.2011; (5): 1♂, 20.vii.2011.

Hadena (Hadena) compta armeriae (Guenée, 1852)

Adult male, fig. 2: 3; male genitalia, figs. 3: 5–6.

Material examined. (5): 3♂, 1♀, 27.v.2011.

Identification. Antenna in male shortly fasciculate, in female shortly ciliate. Forewing ground colour dark ash-grey with whitish-ivory median area and large white orbicular stigma. Reniform stigma encircled with blackish and white, its centre dark greyish; claviform stigma rounded-elliptical, inner area with blackish. Subterminal line white, sinuous, defined by a few short, blackish streaks; marginal area irrorated with fulvous and brown scales. Forewing fringes dotted black and white. Hindwing whitish, more or less fuscous, darker towards the border. This subspecies has a very broad and nearly uniform, pale whitish median field. With the exception of the width and the clean white colour of the median area, the differences between the two subspecies *compta* and *armeriae* are negligible. In male genitalia, valva broad, short; costa also broad, with small nose-like process. Cucullus broad, less separated with small corona; process of sacculus flat and broad. Aedeagus rather small and short, everted vesica with large, hook-like cornutus; a lateral patch of fasciculate cornuti also present. Female ovipositor very large, gonapophyses long and broad. Ductus bursae very short, broad; corpus bursae

membranous, globular with signum in proximal part; in distal part narrow, with strong lateral sclerotisation (Hacker *et al.* 2002). (Figs. 3: 5–6).

Bionomics. Univoltine in the northern parts of its range, flight period is from May to July. A partial second generation appears in late summer in the more southerly regions (Hacker *et al.* 2002). In Iran, adults are attracted to light in early summer in the Khorasan-e-Razavi province. The species inhabits various steppe biotopes, both in low-land plains and in medium-high and higher altitudes. We collected this moth in a mountainous area (1550 m) in Khorasan-e-Razavi province. The early stages were described by numerous authors such as Spuler (1908), Forster & Wohlfahrt (1971). The larvae feed on the flowers and seeds of Caryophyllaceae species, the main host plant is *Dianthus carthusianorum* (Linnaeus, 1753) (Hacker *et al.* 2002). There are four species of the genus *Dianthus* in the Khorasan-e-Razavi province (Jafari *et al.* 2009).

Distribution. Russia, Turkmenistan, Kirghizstan, Kazakhstan, Mongolia, China and Japan (Hacker 1996). All populations of *H. compta* from SE Russia belong to ssp. *armeriae* (Hacker *et al.* 2002). We collected three males and one female of this species from the Binaloud Mountains of Khorasan-e-Razavi province, NE Iran.

H. gueneei hostilis (Püngeler, 1806)*; material examined. (5): 5♂, 2♀, 27.v.2011. (coll. P. Gyulai).

Note: Muhabbet *et al.* (2007) mentioned this species in the list of Iranian noctuid species based on literature review. We couldn't find any of such record in the literature.

H. perplexa (Denis & Schiffermüller, 1775); material examined. (5): 1♂, 1♀, 27.v.2011; (7): 3♂, 2♀, 10.v.2011.

H. montana (Brandt, 1941); material examined. (19): 5♂, 7♀, 13.vii.2012.

Mythimna vitellina (Hübner, 1808); material examined. (3): 1♂, 2♀, 10.viii.2010; (7): 12♂, 7♀, 10.v.2011. (2): 6♂, 9♀, 11.vii.2010–27.vi.2011; (15): 1♀, 11.ix.2010.

M. unipuncta (Haworth, 1809); material examined. (1): 1♂, 20.viii.2011; (16): 1♀, 12.vii.2010; (2): 2♂, 3♀, 11.vii.2010–27.vi.2011; (15): 2♀, 11.ix.2010.

M. ferrago argyristis (Rambur, 1858)*; material examined. (3): 2♂, 10.viii.2010.

Note: This subspecies was reported for the first time from Elburz Mountains in North Iran (Ebert & Hacker 2002). This is the second report of this subspecies from Iran.

M. l-album (Linnaeus, 1767); material examined. (5): 1♂, 27.v.2011; (17): 1♀, 22.vi.2010. (2): 3♂, 4♀, 11.vii.2010–27.vi.2011; (15): 1♂, 1♀, 11.ix.2010; (1): 1♂, 12.v.2011–20.viii.2011; (3): 1♂, 1♀, 10.viii.2010.

Leucania punctosa (Treitschke, 1825)*; material examined. (9): 3♂, 4♀, 07.ix.2010.

L. loreyi (Duponchel, 1827)*; material examined. (5): 1♂, 27.v.2011; (1): 6♂, 4♀, 12.v.2011–20.viii.2011; (13): 1♂, 02.v.2011.

Subfamily **Noctuinae** Latreille, 1809

Hemiexarnis berezskii iuguma (Brandt, 1938); material examined. (18): 2♂, 2♀, 28.vii.2011.

Dichagyris grisescens Staudinger, 1878; material examined. (4): 1♀, 05.vii.2011; (5): 1♀, 29.vii.2010; (3): 1♀, 10.viii.2010.

D. leucomelas Brandt, 1941; material examined. (9): 1♀, 31.v.2011.

D. psammochroa (Boursin, 1940) *; material examined. (14): 2♂, 05.vi.2011; (18): 1♂, 28.vii.2011.

D. tyrannus (A. Bang-Haas, 1912); material examined. (14): 1♂, 05.vi.2011.

D. humilis (Boursin, 1940); material examined. (18): 2♂, 3♀, 28.vii.2011.

D. celebrata (Alphéraky, 1897) *; material examined. (13): 1♀, 02.v.2011.

D. candelisequa (Denis & Schiffermüller, 1775) *; material examined. (4): 1♂, 1♀, 01.ix.2011.

D. multicuspis (Eversmann, 1852); material examined. (13): 5♂, 7♀, 02.v.2011.

D. forficula (Eversmann, 1851); material examined. (7): 2♂, 1♀, 10.v.2011; (13): 5♂, 4♀, 02.v.2011.

D. amoena (Staudinger, 1891) *; material examined. (11): 1♀, 5.x.2010 (coll. P. Gyulai).

D. anastasia (Draudt, 1936) *; material examined. (19): 3♂, 13.vii.2012.

D. truculenta khorassana Brandt, 1941; material examined. (9): 1♂, 3♀, 07.ix.2010 (coll. P. Gyulai).

Note: This subspecies was described by Brandt (1941) from Binaloud Mountains in Khorasan-e-Razavi province of Iran. Our specimens were also collected from the type locality and it is the second report after Brandt (1941).

D. orientis (Alpheraky, 1882) *; material examined. (2): 1♂, 2♀, 11.vii.2010–27.vi.2011.

D. flammatra (Denis & Schiffermüller, 1775); material examined. (13): 2♂, 2♀, 02.v.2011.

Euxoa homicida (Staudinger, 1900); material examined. (5): 3♂, 27.v.2011.

E. conspicua (Hübner, 1827) *; material examined. (14): 2♂, 1♀, 05.vi.2011; (1): 1♂, 20.viii.2011 (coll. P. Gyulai).

E. aneucta binaloudica Brandt, 1941; material examined. (18): 1♂, 28.vii.2011.

Note: This subspecies was described from Binaloud Mountains in Khorasan-e-Razavi province by Brandt (1941) and until now, was only reported from the type locality. We collected it from the same place and about the same altitude (3100 m).

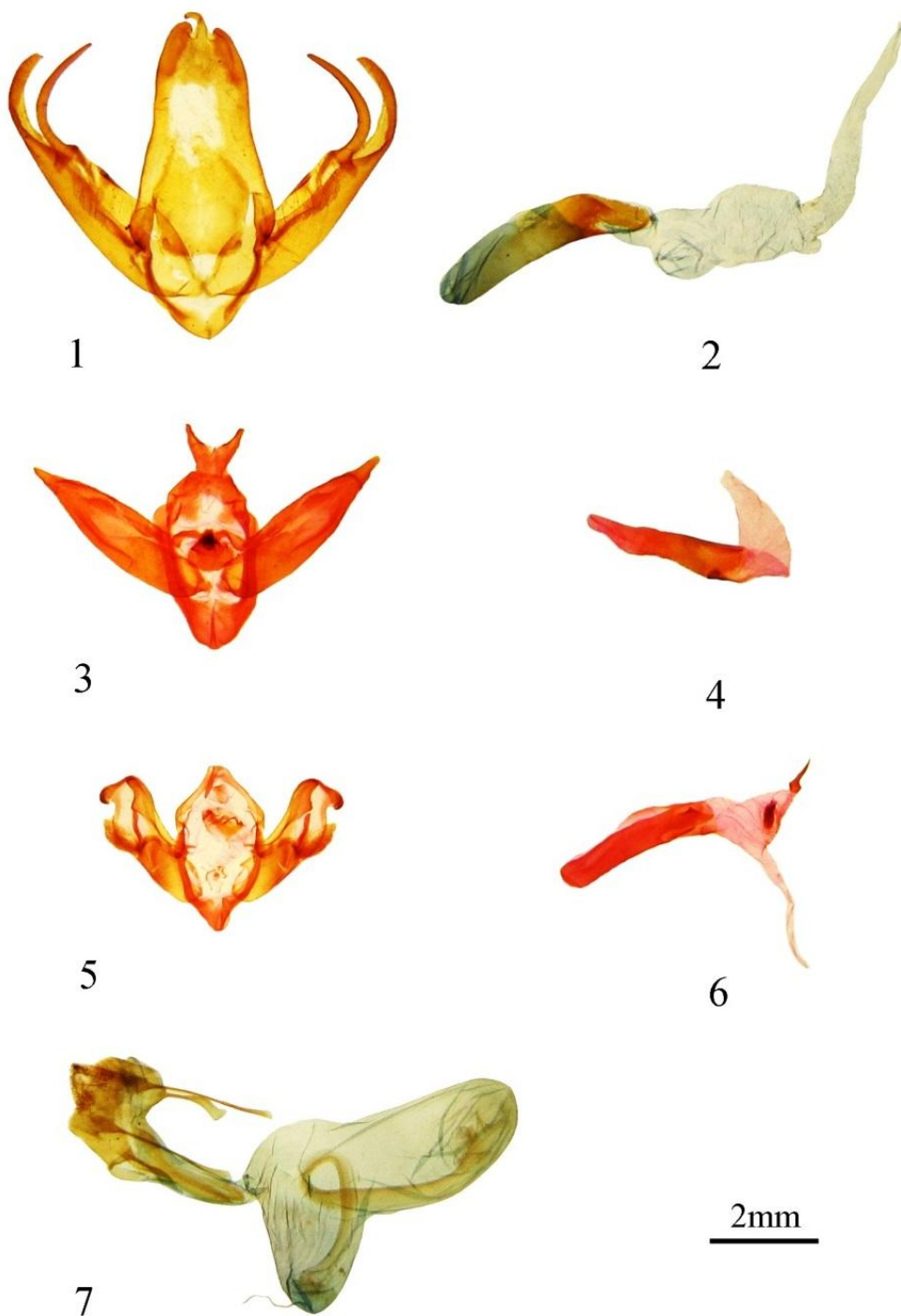


Fig. 3. Genitalia of new records for the Iranian fauna:

1–2. Male genitalia of *Noctua fimbriata*; 1. Valva, 2. aedeagus;

3–4. Male genitalia of *Eicomorpha firyuza*; 3. Valva, 4. aedeagus;

5–6. Male genitalia of *Hadena compta armeriae*; 5. Valva, 6. aedeagus;

7: Female genitalia of *Euxoa sayvana*.

E. sigmata Kozhanchikov, 1928; material examined. (9): 1♀, 07.ix.2010.

E. aquilina (Denis & Schiffermüller, 1775)*; material examined. (4): 1♀, 01.ix.2011; (14): 1♀, 05.vi.2011.

E. cos (Hübner, 1824)*; material examined. (5): 1♂, 1♀, 29.vii.2010.

E. basigramma hyrcana Corti, 1932; material examined. (9): 3♂, 07.ix.2010.

E. difficillima Draudt, 1937; material examined. (18): 5♂, 6♀, 28.vii.2011.

E. sayvana Varga & Ronkay, 1998

Adult female, fig. 2: 5; female genitalia, 3: 7. (coll. P. Gyulai).

Material examined. (6): 1♀, 15.vii.2010; (11): 1♀, 05.x.2010.

Identification. This species is a relatively large *Euxoa* species (wingspan 33–38 mm) with regular, contrasting markings and black and light grey-white general coloration. The male antenna, wing shape and wing pattern are generally reminiscent of *E. temera* (Hubner, [1808]), but *E. sayvana* is more contrasting in wing pattern and colouration. Its ground colour is lighter grey with a very delicate ochreous hue, the brownish colouration is practically reduced to the darker blackish-brown markings of the maculation and the transverse line; This species shows some external similarity also to three not very closely related *Euxoa* species. *E. adjemi* Brandt, 1941 is externally quite similar, but is more long-winged, the ground colour is more brownish and the pectination of the male antenna is much shorted. *E. dsheiron* Brandt, 1938, has similar bipectinated antenna but the pectination is more equal on both sides of antenna. It is shorter-winged and has a typical yellowish/brownish coloration. *E. emolliens* Warren, 1909 is also shorter-winged more ochreous-brownish in colouration and has shortly pectinated antennae (Ronkay et al. 1998). In male genitalia, uncus long, slender, apex finely pointed, tegumen rather low, penicular lobes small. Fultura inferior high, vinculum short, strong, V-shaped, valvae almost symmetrical, narrow, curved at middle, costa with rounded lobe at this curve. Cucullus short, slightly dilated, foot-shaped, corona long. Sacculus long, clavus reduced, harpe long, slender. Aedeagus short, cylindrical, carina with two long, sclerotized lateral bars. Vesica broadly tubular, everted forward, recurved dorsally; basal part with two small, semiglobular diverticula. Distal, recurved part inflated, finely scobinate, having large, curved diverticulum at inner arch of main tube. In Female genitalia, ovipositor medium-long, strong, conical, papillae anales covered with short setae; gonapophyses medium-long, strong, Ostium bursae calyculate, ductus bursae narrow, tubular, flattened, both surface with continuous sclerotized plates running from posterior end of ostium to proximal part of ductus bursae. Appendix bursae large, conical, pointed, projected laterally, corpus bursae elliptical-sacculiform, finely scobinate (Ronkay et al. 1998). (Fig. 3: 7).

Distribution. Turkmenistan (Ronkay et al. 1998). We collected one female of this species from the Binaloud Mountains and one female from agricultural fields of Khorasan-e-Razavi province, NE Iran.

E. clauda Püngeler, 1906; material examined. (9): 1♂, 31.v.2011.

Euxoa sp.; material examined. (11): 1♀, 05.x.2010 (coll. P. Gyulai).

Agrotis crassa (Hübner, 1803)*; material examined. (11): 4♂, 5♀, 05.x.2010.

A. exclamationis (Linnaeus, 1758); material examined. (2): 4♂, 6♀, 11.vii.2010–27.vi.2011.

A. segetum (Denis & Schiffermüller, 1775); material examined. (2): 2♂, 1♀, 11.vii.2010–27.vi.2011.

A. ipsilon (Hufnagel, 1766); material examined. (7): 1♂, 1♀, 10.v.2011; (11): 1♂, 05.x.2010; (2): 7♂, 12♀, 11.vii.2010–27.vi.2011; (15): 2♂, 3♀, 11.ix.2010; (13): 2♂, 1♀, 02.v.2011.

Eicomorpha firyuza Ronkay, Varga & Hreblay, 1998

Adult male, fig. 2: 2; male genitalia, figs. 3: 3-4.

Material examined. (7): 1♂, 10.v.2011.

Note: Two species of the genus *Eicomorpha* were previously reported from Iran (Ebert & Hacker 2002; Muhabbet et al. 2007).

Identification. Wingspan 40-43 mm. The forewing ground colour is more brownish grey and the crosslines and the stigmata are more sharply defined. Abdomen whitish grey. Antenna bipectinated, branches rather long. Orbicular and reniform stigmata present, although often diffuse, small, narrow and encircled by pale whitish-grey scales, filled with ground colour. Hindwing greyish brown, veins darker (Fig. 2:2). The male genitalia is generally smaller than that of *E. antiqua* Staudinger, 1888, which occurs in southern Iran, the cucullus is less elongated, more or less straight and the ventral margin of the sacculus is also more rounded. Genital capsula strongly sclerotized, Uncus bifurcate with deep median incision, tegument low, vinculum strong, rather short and U-shaped. Fultura inferior drop-shaped, dorsal part with stronger sclerotization. Valva elongated, distally tapering. Sacculus short, saccular plate present, harpe and ampulla absent. Aedeagus cylindrical, straight, carina strongly sclerotized, bearing well-developed spine. Vesica short and recurved near base (Figs. 3:3-4). In the female, ovipositor large, strongly sclerotized, more or less conical. Posterior apophyses long, slender, anterior ones rather short, stick-like. Ostium bursae short, broad, ductus bursae rather short, flattened, partly folded and heavily sclerotized (Ronkay et al. 1998).

Bionomics. Adults are on wing in mid-spring, from the second part of April to the middle of May and are strongly attracted by the artificial light. The early stages and bionomics are unknown (Ronkay et al. 1998).

Distribution. Turkmenistan, Uzbekistan, ?Kirghizia (Ronkay et al. 1998). We collected one male of this species from the Iranian part of the Kopet-Dagh Mountain in the Khorasan-e-Razavi province, NE Iran.

Rhyacia arenacea (Hampson, 1907); material examined. (13): 3♂, 3♀, 02.v.2011.

Chersotis kouros Varga & Ronkay, 1996; material examined. (9): 1♀, 07.ix.2010 (coll. P. Gyulai).

Note: This female was first identified with question mark as *Ch. ?juvenis* Staudinger, 1901 (Rabieh et al.

2013a), because the female genitalia of the two species are very similar. Herewith, we correct it as *Ch. kouros* which belongs to the *juvenis* species-group. According to Varga *et al.* (2013), *Ch. kouros* can be distinguished from *Ch. juvenis* by the deeper V-shaped incision of antrum, significantly broader sclerotized posterior part of ductus bursae, no such strong crests in medial section which are present in *Ch. juvenis*.

Noctua fimbriata (Schreber, 1759)

Adult male, fig. 2: 1; male genitalia, figs. 3: 1-2.

Material examined. (5): 1♂, 1♀, 29.vii.2010.

Identification. This species can be confused with the sister species, *N. tirrenica* Biebinger, Speidel & Hanigk, 1983 (which has been recorded from North Iran). These two closely similar sibling species are described together in order to compare the differences. Wingspan 45–61 mm (male 45–57 mm, female 49–61 mm) in both species, although in *N. tirrenica* is slightly larger. As in *N. pronuba* (Linnaeus, 1758) (which also occurs in North Iran), both species are sexually dimorphic and polymorphic; *N. fimbriata* has a darker ground colour. Superficial differences between the two species are as follows: on the upper side of the hindwing the inner side of the black band is straighter in *N. tirrenica*, more concave in *N. fimbriata*; on the underside of the forewing the black area is more extensive in *N. fimbriata*, because the black scaling extends from vein 1 to the dorsum, whereas in *N. tirrenica* the region between vein 1 and the dorsum is lighter, yellowish. Generally, the underside of the abdomen, the costal, terminal and dorsal areas of the underside of the of the forewing, and the costal region of the underside of the hindwing are whiter in *N. tirrenica* and more buff in *N. fimbriata* – features of sufficient clarity for one to be able to distinguish the two species with a fair degree of certainty as they approach a light. Correct determination needs examination of genitalia as follows: In the male genitalia, the uncus is narrower in *N. fimbriata* and has two tips on each side of the thin uncus-top; the juxta is smaller in *N. tirrenica* (Figs. 3:1-2). In the female, the ductus bursae is narrower in *N. tirrenica*, and in *N. fimbriata* there is a long peculiar finger-shaped projection arising from the antrum, which is lacking in *N. tirrenica* (Fibiger 1993).

Bionomics. The habitat is open areas or woodland in southern Europe up to 2000 m. This moth is recorded as a migrant (Fibiger 1993). The species occurs from July to September and is attracted to light and sugar. The early stages of *N. fimbriata* are described in e.g. Heath & Emmet (1979). In the Binaloud Mountains (altitude 1550 m), this moth was attracted to a light trap in late July.

Distribution. Outside Europe, *N. fimbriata* has been recorded in Turkey, the Caucasus and Transcaucasia, Armenia, Turkmenistan and Russia (Taganrog, Siberia: Novosibirsk) (Fibiger 1993). We collected a male and a female of this species from the Binaloud Mountains of Khorasan-e-Razavi province, NE Iran.

N. orbona (Hufnagel, 1766)*; material examined. (5): 1♀, 29.vii.2010.

Spaelotis ravidata (Denis & Schiffermüller, 1775)*; material examined. (14): 1♂, 05.vi.2011.

Note: This is the second record of this species from Iran, after Ebert & Hacker's (2002) report from Damavand.

S. deplorata (Staudinger, 1896)*; material examined. (5): 1♂, 1♀, 29.vii.2010.

Note: It is the second record of this species from Iran. It was firstly reported from Kerman province (Sirch) in SE Iran by Shirvani *et al.* (2008).

S. demavendi (Wagner, 1937); material examined. (18): 2♂, 1♀, 28.vii.2011.

S. senna (Freyer, 1829)*; material examined. (19): 1♂, 13.vii.2012.

Xenophysa junctimacula (Christoph, 1887)*; material examined. (18): 3♂, 28.vii.2011.

X. cacumena Brandt, 1938; material examined. (19): 3♂, 13.vii.2012.

Xestia c-nigrum (Linnaeus, 1758); material examined. (5): 2♂, 1♀, 29.vii.2010; (16): 1♂, 1♀, 12.vii.2010; (2): 3♂, 1♀, 11.vii.2010–27.vi.2011; (15): 1♀, 11.ix.2010.

Discussion

In this paper, 64 species of the subfamilies Noctuidae, Hadeninae and Plusiinae of the family Noctuidae belonging to 25 genera are reported from the Khorasan-e-Razavi province. Among them, three species *N. fimbriata*, *E. sayvana*, *E. firyuza* and a subspecies *H. compta armeriae* are new for Iran and 21 species and subspecies are new for the province's fauna. However, we do expect the species list of these subfamilies could be expanded by several species through future studies, both with the species occurring in the bordering countries to Khorasan as well as undescribed new species (for example *Dichagyris spintheropsis* Varga & Ronkay, 1996, which was described from the Kopet-Dagh Mts. in Turkmenistan, may possibly occurs in the Iranian Kopet-Dagh Mts.). The eastern, southeastern and semidesert parts of this province in the southwestern part are still very poorly studied and may also provide additional species for the fauna. Four of five species were collected from a mountainous area near to Gonabad city in the southwestern part of the province were new records for the province's fauna. Unfortunately, there is not any information about the early stages and their food plants of many of the collected species.

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