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Addendum to the Israeli Noctuoidea fauna (Lepidoptera: Noctuidae, Erebidae)

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ABSTRACT

Seventeen species of Noctuoidea (Lepidoptera) are newly recorded for Israel, bringing the owlet moth fauna to 565 species. Four species are new records for the Levant, others have been known from Cyprus, Jordan, Lebanon, and Syria. Most of new records are done in the northern and southern parts of the country. The 'southern' group is represented by the Afrotropical and Pan-Eremic species, which reached the northern limit of their distribution. The 'northern' group is represented by species on the southern border of their distribution, including Trans-Palearctic and Mediterranean elements at the forested medium elevations, the Mediterranean–Iranian species in the montane steppes, and the alpine and xeromontane species at elevations over 2000 m. The pattern of occurrence of the new records reflects the position of Israel in the region as a transitional area between a more humid Mediterranean part in the north and a more arid part in the south.

KEYWORDS: Erebidae, Noctuidae, owlet moths, Middle East, biogeography, new records.

INTRODUCTION

Since publication of two books on the Israeli noctuids that included 548 species (Kravchenko *et al.* 2007*a*, *b*), another 17 species were collected in Israel resulting the increase of the Israeli noctuid fauna to 565 species. Presently, the former family Noctuidae is divided into four distinct families, Erebidae, Euteliidae, Noctuidae and Nolidae (Fibiger & Lafontaine 2005).

MATERIALS AND METHODS

All specimens were collected by automatic light traps with black light UV lamps T5 BlB8w fed from domestic electricity supply. Containers of the traps were emptied once a month. The program of the light-trapping in Israel was described in Müller *et al*. (2005).

Classification of biogeographical categories applied in this survey follows that for the Lepidoptera of the Levant (Kravchenko *et al*. 2007*a*, *b*) and Saudi Arabia (Wiltshire 1990). The biogeographic term 'Eremic' is applied to species inhabiting

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the southern Palearctic desert belt from the African Atlantic coastal desert, through the Sahara to deserts of central Asia and northern India.

All studied material is deposited in collection of the Steinhardt Museum of Natural History and Research Center, Tel Aviv University, Israel.

ANNOTATED LIST OF SPECIES

Family Erebidae

Subfamily Hypeninae

1. *Hypena rostralis* (Linnaeus, 1758)

(Fig. 1)

Material: 1 specimen, Upper Galilee, Nahal Betzet, v.2010, V. Kravchenko & G. Müller.

Distribution: Trans-Palearctic, all over central and southern Europe and southern Siberia. In the Levant the species was recorded from Lebanon and Syria (Hacker 2001).

Habitat and phenology: In Europe the species occurs in humid shrubs, in Israel it was collected in May in a riverine forest. The species is bivoltine, in southern Europe flying in May–August, in the Levant probably univoltine.

Host plants: *Urtica* spp. (Urticaceae), *Humulus* spp. (Cannabaceae) and *Rubus* spp. (Rosaceae) (Fibiger *et al.* 2010).

Subfamily Catocalinae

2. *Hypotacha ochribasalis* (Hampson, 1896)

(Fig. 2)

Material: 2 specimens. Southern Negev, Nahal Shlomo, x.2010, V. Kravchenko & G. Müller.

Distribution: Afrotropical with penetration to Mediterranean: Burkina Faso, Ethiopia, Ghana, Kenya, Mauritania, Oman, Saudi Arabia, Sudan, Tanzania, Yemen, and Iraq. This is the first record of the species in the Levant.

Habitat and phenology: The species occurs in steppes and savannas. In Saudi Arabia it is flying in April and in September to October (Wiltshire 1990; Kühne 2005).

Host plants: Unknown. Probably *Acacia* spp. (Fabaceae) like for *Hypotacha indecisa* (Walker, 1858).

3. *Anumeta cestis* (Ménétriès, 1849)

(Fig. 3)

Material: 1 specimen. Southern Arava, Yotvata, iv.2010, V. Kravchenko & G. Müller.

Distribution: (Pan-)Eremic. The range of the species extends from Morocco and Mauretania throughout all over the Palearctic desert belt to Central Asia and Mongolia. In the Levant it has been recorded from Jordan (Hacker 2001).

Habitat and phenology: The species occurs in stony and sandy deserts. In Jordan it was collected in April (Fabiano & Zilli 2001).

Host plants: Probably *Calligonum* spp. (Polygonaceae) like for other congeners.

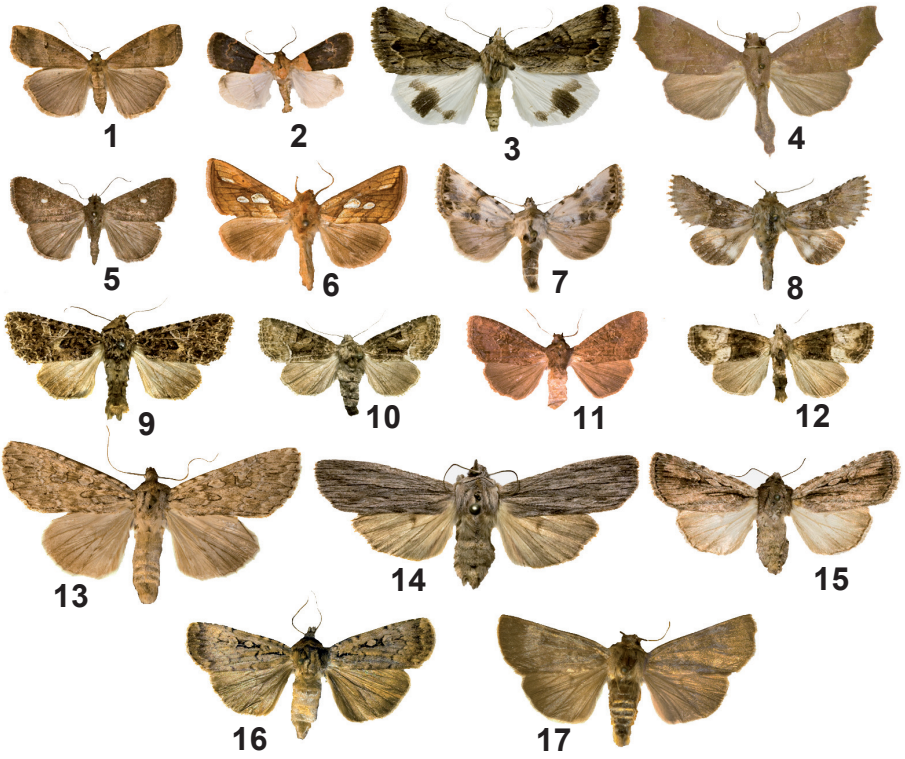
Subfamily Scoliopteryginae

4. *Anomis leona* (Schaus & Clements, 1893)

(Fig. 4)

Material: 1 specimen. Central Coastal plain, Rishon LeZion, v.2010, V. Kravchenko & G. Müller.

Distribution: Afrotropical: all over Sub-Saharan Africa, penetrates to Arabian Peninsula (Yemen and Saudi Arabia). This is the first record of the species in the Levant.



Figs 1–17: New Noctuoidea from Israel: (1) *Hypena rostralis*, (2) *Hypotacha ochribasalis*, (3) *Anumeta cestis*, (4) *Anomis leona*, (5) *Amyna axis*, (6) *Plusia festucae*, (7) *Calophasia opalina*, (8) *Omphalophana durnalayana*, (9) *Hadena capsincola*, (10) *Oligia latruncula grisescens*, (11) *Mesapamea secalis*, (12) *Mesoligia furuncula*, (13) *Eremohadena (Pseudohadena) chenopodiphaga*, (14) *Lithophane merckii*, (15) *Dichagyris signifera*, (16) *Spaelotis senna iranica*, (17) *Standfussiana lucernea*.

Habitat and phenology: In Ethiopia the species occurs in gardens and lush grasslands, flying all over the wet season from April to October.

Host plants: Polyphagous. Moths are found mainly on plants of the family Malvaceae, but are also known as a serious pest of tomato, cocoa, mango and corn.

Subfamily Boletobiinae

5. *Amyna axis* Guenée, 1852

(Fig. 5)

Material: 1 specimen. Southern Negev, Nahal Shlomo, x.2010, V. Kravchenko & G. Müller.

Distribution: Afrotropical: All over Sub-Saharan Africa, penetrates to Arabian Peninsula (United Arab Emirates, Yemen, Saudi Arabia). This is the first record of the species in the Levant.

Habitat and phenology: Grassland species. In Africa probably multivoltine.

Host plants: Amaranthaceae: *Chenopodium alba*, *Beta vulgaris*.

Family Noctuidae

Subfamily Plusiinae

6. *Plusia festucae* (Linnaeus, 1758)

(Fig. 6)

Material: 3 specimens. Foothills of Hermon Mt., Tel Dan Nature Reserve, iv.2010, V. Kravchenko & G. Müller.

Distribution: Trans-Palearctic: from Morocco across southern and central Europe to Korea and Japan. This is the first record of the species in the Levant.

Habitat and phenology: In Europe, and probably in Israel, the species occurs in wet meadows or similar habitats. Bivoltine, in Europe flying from April to September in two partly overlapping generations.

Host plants: *Iris* spp. (Iridaceae), *Carex* spp. (Cyperaceae), *Alisma* spp. (Alismataceae) and *Typha* spp. (Typhaceae). Probably polyphagous (Goater *et al.* 2003).

Subfamily Oncocnemidinae

7. *Calophasia opalina* (Esper, 1794)

(Fig. 7)

Material: 1 specimen. Golan Heights, Majdal Shams, iv.2010, V. Kravchenko & G. Müller.

Distribution: Mediterranean–Iranian: Southern Europe, Turkey, Iran, Kazakhstan, Turkmenistan, Afghanistan, Mongolia. In the Levant there is an old record from Lebanon (Ellison & Wiltshire 1939).

Habitat and phenology: In Europe, this is a xerothermic species of stony steppes and grasslands. Bivoltine, in Europe the adults are on the wings in April–June and July–September.

Host plants: *Linaria* spp. (Plantaginaceae), *Antirrhinum* spp. (Plantaginaceae) and *Delphinium* spp. (Ranunculaceae) (Ronkay & Ronkay 1995).

8. *Omphalophana durnalayana* Osthelder, 1933

(Fig. 8)

Material: 1 specimen. Golan Heights, Majdal Shams, v.2010, V. Kravchenko & G. Müller.

Distribution: Anatolian–Iranian species, with eastern Anatolian core area: Turkey, Iraq and Iran. In the Levant it has been recorded in Syria (Ronkay & Ronkay 1995).

Habitat and phenology: Montane steppes. Univoltine, flying in April, May.

Host plants: Unknown. Probably species of the family Dipsacaceae like other *Omphalophana* spp.

Subfamily Hadeninae

9. *Hadena capsincola* (Denis & Schiffermüller, 1775)

(Fig. 9)

Material: 1 specimen. Mt. Hermon, 2000 m a.s.l., vi.2010, V. Kravchenko & G. Müller.

Distribution: Trans-Palearctic: from Europe to Turkey, Middle East, Levant, the Urals, Turkmenistan, Tajikistan, and China. In the Levant it is recorded in Lebanon (Hacker 2001).

Habitat and phenology: In Europe, the species occurs on forest edges, slopes of hills, whereas in Israel, it has been collected in tragacanth belt. Univoltine, in Europe flying from April to June.

Host plants: *Silene* spp. (Caryophyllaceae).

Subfamily Xyleninae

10. *Oligia latruncula grisescens* (Heydemann, 1932)

(Fig. 10)

Material: 2 specimens. Golan Heights, Majdal Shams, v.2010, V. Kravchenko & G. Müller.

Distribution: Mediterranean–Iranian: from northern and southern Europe to the Urals, Iran and Middle East. In the Levant the species has been recorded in Lebanon and Syria (Hacker 2001).

Habitat and phenology: In Europe, the species occurs in steppes; in Israel, it has been collected in grasslands. Univoltine, in Europe occurring from May to July (Fibiger & Hacker 2007).

Host plants: Larvae bore into tip of hibernating grass shoots (Wagner 2005–2018), particularly affecting *Dactylis glomerata* (Poaceae) (Hacker 2001).

11. *Mesapamea secalis* (Linnaeus, 1758)

(Fig. 11)

Material: 1 specimen. Meron Nature Reserve, forest glade, v.2010, V. Kravchenko & G. Müller.

Distribution: Mediterranean–Turanian: Morocco, Algeria, all over central and southern Europe to central Asia. In the Levant the species has been recorded in Lebanon (Hacker 2001).

Habitat and phenology: In Europe, the species occurs in wet grasslands; in Israel, it probably prefers the same type of habitat. Univoltine, in Europe flying in May–August (Fibiger & Hacker 2007).

Host plants: Different species of the Poaceae.

12. *Mesoligia furuncula* (Denis & Schiffermüller, 1775)

(Fig. 12)

Material: 2 specimens. Upper Galilee, Nahal Keziv, v.2010, V. Kravchenko & G. Müller.

Distribution: Trans-Palearctic: from central and southern Europe to China. In the Levant, the species has been recorded in Lebanon (Hacker 2001).

Habitat and phenology: In Europe, the species occurs in grasslands and steppe species; in Israel, it has been collected in meadows. Univoltine, in Europe flying in May–August (Fibiger & Hacker 2007).

Host plants: Different species of the Poaceae.

13. *Eremohadena (Pseudohadena) chenopodiphaga* (Rambur, 1932)

(Fig. 13)

Material: 1 specimen. Golan Heights, El Room, v.2010, V. Kravchenko & G. Müller.

Distribution: Mediterranean–Iranian: Morocco, Tunisia, Corsica, Spain, Italy, Turkey, Georgia, Iraq, Iran, and Turkmenistan. In the Levant, it has been recorded in Lebanon and Syria (Hacker 2001).

Habitat and phenology: In Europe, as well as in Israel, the species occurs in steppes. Univoltine, in Europe flying from March to May.

Host plants: Amaranthaceae: *Chenopodium fruticosum*, *Atriplex portulacoides* and *Salsola soda*.

14. *Lithophane merckii* (Rambur, 1832)

(Fig. 14)

Material: 2 specimens. Foothills of Hermon Mt., Tel Dan Nature Reserve, i.2010, V. Kravchenko & G. Müller.

Distribution: Generally (North-)Mediterranean: Spain, France, Switzerland, Italy, Greece, Serbia, Romania, Bulgaria, Turkey, Cyprus. In the Levant, it is recorded in Cyprus.

Habitat and phenology: In Europe, the species occurs in deciduous and mixed forests: in Israel, it has been collected in the riverine forest. Univoltine, in Europe flying in October–November, overwintering and flying again from January until May.

Host plants: In Europe *Alnus glutinosa* (Betulaceae), in Israel probably *A. orientalis* (Fibiger & Hacker 2007).

Subfamily Noctuinae

15. *Dichagyris signifera* (Denis & Schiffermüller, 1775)

(Fig. 15)

Material: 1 specimen. Mt. Hermon, 1600 m a.s.l., vi.2010, V. Kravchenko & G. Müller.

Distribution: Mediterranean–Iranian, oromontane: from southern France, Italy, Greece to the Urals, and toward the south to Turkey, Iraq, Iran. In the Levant, the species has been recorded in Lebanon (Fibiger 1990).

Habitat and phenology: In the Alps, the species occurs in rocky and steppe habitats; in eastern Europe, in forest steppes; in Israel, in the montane steppe of Mt. Hermon. Univoltine, in Europe flying all over summer.

Host plants: Different species of the Poaceae.

16. *Spaelotis senna iranica* (Draudt, 1938)

(Fig. 16)

Material: 1 specimen. Mt. Hermon, 2000 m a.s.l., vi. 2010, V. Kravchenko & G. Müller.

Distribution: *Spaelotis senna* (Freyer, 1829) is Mediterranean–Iranian oromontane species and is known from Morocco, Spain, Switzerland, Italy, Germany, Greece, Albania, Turkey, Iran (Elburz Mts), Armenia and Azerbaijan (Aliev 1984). In Lebanon, Iran and Turkey, it is represented by the subspecies *S. s. iranica*. In Lebanon, the subspecies is recorded in Bsharri at 1900–2000 m (Hacker 2001).

Habitat and phenology: In Europe, moths dwell in open, rocky areas at altitudes up to 2550 m (Fibiger 1993); in Israel, it is an alpine species. In Europe, it flies from late June to mid-September.

Host plants: In Europe, the larvae feed on *Artemisia* spp. (Asteraceae) (Fibiger 1993).

17. *Standfussiana lucernea* (Linnaeus, 1758)

(Fig. 17)

Material: 4 specimens. Mt. Hermon, 2000 m a.s.l., vi.2010, V. Kravchenko & G. Müller.

Distribution: Mediterranean–Iranian, oromontane: Central and South Europe and the Middle East. In the Levant the species has been recorded from Lebanon (Fibiger 1990).

Habitat and phenology: In Spain, these moths dwell in open, rocky areas up to 3000 m; in northern Europe, also on rocky coasts (Fibiger 1993); in Israel, this is an alpine species. In Europe the moths are flying from June to September, being most common in July (Fibiger 1993).

Host plants: *Campanula* spp. (Campanulaceae), *Sedum* spp. (Crassulaceae), *Saxifraga* spp. (Saxifragaceae), *Chamaenerium* spp. (Onagraceae), *Primula veris*

Fig. 2: Distribution of the new records in Israel. The number on the map corresponds to the ordinal number of species in the text.

(Primulaceae), *Stellaria media* (Caryophyllaceae), *Cerastium* spp. (Caryophyllaceae) and *Artemisia* spp. (Asteraceae) (Fibiger 1993).

DISCUSSION

Seventeen species of the Noctuoidea (Lepidoptera) are newly recorded for Israel, thus bringing the owlet moth fauna of the country to 565 species. Four species are new records for the Levant: *Anomis leona*, *Plusia festucae*, *Hypotacha ochribasalis*, and *Amyna axis*. Other species have been known from others countries of the Levant: Cyprus, Jordan, Lebanon, and Syria. Despite extensive light-trap collecting all over the country (Müller *et al.* 2005), most of new records concentrate in the north and in the south (Fig. 18). Only *Anomis leona* has been recorded in a park zone on the Coastal Plain in central Israel. The 'southern' group is represented by Afrotropical (*H. ochribasalis*, *A. axis*) and Pan-Eremic species (*A. cestis*), which reached the northern limit of their distribution. The 'northern' group is composed of species at the southern limit of their distribution. In forested areas at medium elevations in the north, these are Trans-Palearctic (*H. rostralis*, *P. festucae*, *H. capsincola*, *M. furuncula*) and Mediterranean (*L. merckii*), elements; in the montane steppe zone, Mediterranean–Iranian species (*C. opalina*, *O. latruncula*, *P. chenopodiphaga*, *D. signifera*, *S. senna*, *S. lucernea*, *M. secalis*) with one Anatolian–Iranian species *O. durnalayana*; at higher elevations (>2000 m) alpine and xeromontane species are collected.

The pattern of occurrence of the newly recorded species reflects the position of Israel in the region as a transitional area between a more humid Mediterranean part in the north and a more arid part in the south.

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