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On the winter and spring aspect of the Macrolepidoptera fauna of Jordan with remarks on the biology of some species

(Lepidoptera: Tineoidea, Cossoidea, Bombycoidea, Papilionoidea, Geometroidea, Noctuoidea)

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Abstract

The results of two lepidopterological expeditions to Jordan from December 20 to December 30, 2008 (provinces of Irbid, Karak, Tafila und Ma'an) and March 19 to March 25, 2009 (provinces: Zarqa, Tafila, Irbid and Balqa) are presented. A total of 166 species of Macrolepidoptera could be recorded, among them 21 species new for Jordan. *Desertobia heloxylonia lawrencei* **subsp. n**. is described.

The female genitalia of *Odontopera jordanaria* (STAUDINGER, 1898) **comb. n**., are figured for the first time. The larvae of *Odontopera jordanaria* STAUDINGER, 1898, *Minucia wiskotti* (PÜNGELER, 1902), *Allophyes benedictina* (STAUDINGER, 1892), *Agrochola pauli* (STAUDINGER, 1892), *Agrochola scabra* (STAUDINGER, 1892), *Agrochola staudingeri* RONKAY, 1984, *Conistra acutula* (STAUDINGER, 1892), *Polymixis apora* (STAUDINGER, 1898) and *Polymixis juditha* (STAUDINGER, 1898) are described and figured.

Introduction

Our knowledge of the winter aspect of the macrolepidoptera fauna of the southwestern Palaearctic region is still lower compared to other seasons. It has been shown during expeditions that in countries with subtropical-mediterranean climate an interesting macrolepidoptera fauna with numerous poorly known or even new species could be ascertained, in the eremic as well as in the steppe and mediterranean zone. The focus of this communication is on the Noctuidae family, because Noctuid species dominate the species composition in winter (e.g. DE FREINA & BEHOUNEK 1996; FIBIGER 1993, 1997; LEHMANN & SALDAITIS 2006). Good experiences of the authors, despite weather risks, during trips to Tunisia (publication of the results in preparation) and South Iran (LEHMANN et al. 2009) at the end of December and the fact that the lepidopterous fauna of Jordan is still not as well known as that of neighboring Israel/Palestine led to this December trip. Animated by the authors and their interesting results Steffen SCHELLHORN (Halle/Saale) travelled to Jordan in March 2009 and could record interesting species on four locations. We heartily thank him for allowing us to use his dates and material for evaluation. The results with 166 recorded macrolepidoptera species are presented here.

As a basis for the analysis of the material, the following current literature was used: for the butterflies KATBEH-BADER et al. (2003), Nolidae MÜLLER et al. (2010), Noctuidae HACKER (2001) and KRAVCHENKO et al. (2007, 2008), Geometridae HAUSMANN (1991) as well as relevant standard literature (also for the "Bombycids", see references). The weather conditions of the winter trip made collecting with light traps and sugar baits possible in the first three nights in the northern Mediterranean oak and upper steppe zone (600-1000m). There were maximum temperatures with just under 20°C and night temperatures of 11-14°C during the approximately three to four hours of light trapping. Then, afterward, a nationwide dropping of temperatures around approx. 5-7°C occurred, so that a satisfactory moth trapping was possible only below 400-600m.

[1] deceased in October 14, 2011

Methods and Material

The focus of our interest was again on all macrolepidoptera groups, especially to get a better knowledge of the biology of different species by breeding them. Therefore, we tried to achieve ovipositions from as many females as possible in order to breed the species in Germany. Two different light trap facilities (with HQI-, HWL, and black light lamps), four portable, electronic light traps and sugar baits (only at the North Jordan localities in December) were used as collecting methods for the nocturnal moths. As far as permitted by weather and time, butterflies were observed during the day and we also searched for caterpillars and eggs. The material is deposited in the collections of the authors and Steffen SCHELLHORN, voucher specimens in ZSM and private collections.

List of the visited Jordan localities (see also Fig. 8 and 9) and explanation of its abbreviations:

First trip (STADIE & LEHMANN)

Ajlun	JORDAN, Prov. Irbid, Ajlun Forst Reserve,1km E Ajlun, N 32°42’43’’, E 35°45’18’’, 950m, 20. XII. 2008.
Ajlun-Hotel	JORDAN, Prov. Irbid, western outskirts of Ajlun, Ajlun-Hotel, ca. 900m, 20.-21. XII. 2008.
Awsarah	JORDAN, Prov. Irbid, near road Ba’un-Awsarah, 1km N Awsarah, NW Ajlun, N 32°22’55’’, E 35°42’51’’, ca. 500-600m, 21. XII. 2008.
Sulay	JORDAN, Prov. Irbid, street Sulaykhat-Kirbet al-Wahadna, ca. 100m, 22. XII. 2008.
Wadi Rayyan	JORDAN, Prov. Irbid, canyon of Wadi Rayyan, next to Ba’un(Judayta), N 32°23’31’’, E 35°42’46’’, ca. 600-650m, 22. XII. 2008.
Wadi Mujib	JORDAN, Prov. Karak, above Wadi Mujib, above Mujib Dam, near King’s Highway, N 31°26, E 35°48, ca. 350m, 23. XII. 2008 and 30. XII. 2008.
RahmaJ	ORDAN, Prov. Ma’an, Arava Valley, ca. 37km N Aqaba, S Rahma, N 29°51, E 35°07, ca. 50-100m, 24.-25. XII. 2008.
Wadi Rum	JORDAN, Prov. Ma’an, Wadi Rum area, E Aqaba, 2km N Tourist Information (Visitor) Centre, N 29°40’18’’, E 35°28’30’’, ca. 830m, 26. XII. 2008.
Wadi Rum II	JORDAN, Prov. Ma’an, Wadi Rum area, E Aqaba, 3km W Tourist Information (Visitor) Centre, N 29°40’59’’, E 35°25’12’’, ca. 920m, 26. XII. 2008.
Gharandal I	JORDAN, Prov. Ma’an, road Dilagha-Gharandal, ca. 10km E Gharandal, N 30°03’14,5’’, E 35°17’04’’, ca. 400m, 27. XII. 2008.
Gharandal II	JORDAN, Prov. Ma’an, road Dilagha-Gharandal, ca. 13km E Gharandal, ca. 500m, 27. XII. 2008.
Fayfa	JORDAN, Prov. Tafila, SE Fayfa, towards Al Tafila, Wadi, N 30°53’16’’, E 35°29’10’’, ca. 50m, 28. XII. 2008
Al Tafila	JORDAN, Prov. Tafila, road Al Tafila-Fayfa, 16,5km W Al Tafila, ca. 300m, 28. XII. 2008.
Afra	JORDAN, Prov. Tafila, NE Al Tafila, 2km SE (above) Afra, N 30°51’36’’, E 35°31’06’’, ca. 650-700m, 29. XII. 2008.

second trip (SCHELLHORN)

Al Azraq	JORDAN, Prov. Zarqa’, Qa Al Azraq, oasis, lakeside, ca. 400-500m, 19. III. 2009.
Dana Nature R.	JORDAN, Prov. Tafila, Dana Nature Reserve, Hamra Valley, 900m, 20. III. 2009.
Shaubak	JORDAN, Prov. Ma’an, Shaubak [al-Shawbak/ Ash Shawbak], castle, 1000-1200m, 21. III. 2009.
N Ajlun	JORDAN, Prov. Irbid, Ajlun Forst Reserve, 8km N Ajlun, 1000m, 22. III. 2009.
Ajlun-Khirbet	JORDAN, Prov. Irbid, between Ajlun and Khirbet al-Wahadna, 800-900m, 23. III. 2009.
Fayfa	JORDAN, Prov. Tafila, SE Fayfa, Richtung Al Tafila, Wadi, N 30°53’16’’, E 35°29’10’’,ca. 50m, 23. III. 2009.
Al Rumaymin	JORDAN, Prov. Balqa, Al Rumaymin, vicinity of Suwaylih, ca. 600m, 25. III. 2009.

Results

The nomenclature and systematics follows the above-mentioned current standard literature, concerning the Geometridae mainly VIIDALEPP (1996). The frequency given in brackets refers to the observed number of specimens, not necessarily on the number of caught specimens. The abbreviation 'GU' refers to the number of the genital preparation (= Genitaluntersuchung).

Tineoidea

Psychidae

***Amicta murina* KLUG, 1832**
Wadi Mujib (1 bag).
On account of the construction method of the bag it is probably this species (SOBCZYK pers. comm.).

Cossoidea

Cossidae

***Dyspessa kabylaria* BANG-HAAS, 1907**
Fayfa 23. III. 2009 (1)
Reported for Jordan and Israel by YAKOVLEV (2010).

***Phragmataecia castaneae* (HÜBNER, 1790)**
Al Azraq (4); Fayfa 23. III. 2009 (15).

Papilionoidea

Pieridae

***Pieris rapae leucosoma* SCHAWERDA, 1905**
Wadi Rayyan (6); Sulaykhat (1).

***Pontia edusa* (FABRICIUS, 1777)**
Umg. Sakka, SW Al-Karak, 23. XII. 2008 (1).

***Elphinstonia charlonia* (DONZEL, 1842)**
Sulaykhat (1).

***Euchloe melanochloros aegyptiaca* (VERITY, 1911)**
Ajlun-Khirbet (3).
Nomenclature after BACK et al. (2008).

***Euchloe belemia* (ESPER, 1799)**
Ajlun-Khirbet (1).

Lycaenidae

***Lycaena phlaeas timeus* (CRAMER, 1777)**
Ajlun-Khirbet (1).

***Lampides boeticus* (LINNAEUS, 1767)**
Shaubak (1).

Nymphalidae

***Vanessa atalanta* (LINNAEUS, 1758)**
Ajlun-Khirbet (1).

***Vanessa cardui* (LINNAEUS, 1758)**
Aqaba, 24. XII. 2008 (1).

Bombycoidea

Lasiocampidae

***Chondrostega palaestrana* STAUDINGER, 1891**
Ajlun-Khirbet (larvae common); Al Rumaymin (larvae common).

***Trichiura stroehlei carmelea* ZOLOTUHIN, 2007**
Wadi Rayyan (1).

***Bufoidia ledereri* (KOÇAK, 1981)** (Fig. 2A)
Awsarah (1M, 1W); N Ajlun (1).

***Stoermeriana nabataea* DE FREINA, 2002** (Fig. 2B)
Dana Nature Reserve (4).
This species was described recently (DE FREINA 2002) from the surroundings of Petra on material, accumulated in the middle of March, 1999 and in 2000.

***Streblote acaciae* (KLUG, 1829)**
Rahma (2).

Sphingidae

***Daphnis nerii* (LINNAEUS, 1758)**
Wadi Mujib (1).

***Hyles livornica* (ESPER, 1779)**
Wadi Mujib (2); Al Tafila (1), Al Azraq (4); Fayfa 23. III. 2009 (6).

***Hippotion celerio* (LINNAEUS, 1758)**
Fayfa (1) Fayfa 23.III. 2009 (4).

Geometroidea

Geometridae

***Neromia pulvereisparsa jodisata* STAUDINGER, 1898**
Wadi Mujib (1); Rahma (3); Gharandal I (5); Fayfa (7); Al Tafila (2); Fayfa 23. III. 2009 (20).

***Microloxia ruficornis* (WARREN, 1897)**
Wadi Mujib (1); Fayfa 23. III. 2009 (1).

***Hemidromodes sabulifera hessa* PROUT, 1935**
Rahma (6).

***Idaea allongata sublongaria* (STAUDINGER, 1899)**
N Ajlun (1); Fayfa 23. III. 2009 (1).

***Oar pratana mortuaria* (STAUDINGER, 1898)** (Fig. 1G)
Fayfa 23. III. 2009 (1)
New for Jordan!
HAUSMANN (1991) notes the remarkable absence of this species in the rich material of KLAPPERICH from Jordan, although the species is not rare in Israel, especially around the Dead Sea. The validity of a ssp. *mortuaria* STAUDINGER for the Middle East is disputed.

***Scopula decolor flaccata* (STAUDINGER, 1898)**
Fayfa 23. III. 2009 (1)
New for Jordan!

***Scopula marginepunctata* (GOEZE, 1781)**
Wadi Rayyan (1).

***Scopula luridata* (ZELLER, 1847)** (Fig. 4A)
Awsarah (3); Wadi Rayyan (8); Gharandal I (4); Gharandal II (1).
From a female from Wadi Rayyan we could obtain eggs and breed the moth in winter in Germany with hibernating leaf roses of *Onobrychis viciifolia*.

***Scopula chalcographata sinaica* (REBEL, 1948)**
Gharandal I (2); Fayfa (1).

***Scopula sacraria semitata* (PROUT, 1913)**
Gharandal I (1).

***Pseudosterrha rufistrigata* (HAMPSON, 1896)**
Rahma (8); Gharandal I (2); Fayfa 23. III. 2009 (3).

***Rhodometra sacraria* (LINNAEUS, 1767)**
Wadi Mujib (1); Fayfa (1); Afra (1).

***Aplocera plagiata* (LINNAEUS, 1758)**
Awsarah (1).

***Nycterosea obstipata* (FABRICIUS, 1794)**
Wadi Rayyan (1); Fayfa (1); Al Azraq (1).

***Xanthorhoe fluctuata* (LINNAEUS, 1758)**
Wadi Rayyan (1).

***Catarhoe hortulanaria palaestinensis* (STAUDINGER, 1894)**
Ajlun (7); Awsarah (8); Wadi Rayyan (21)
New for Jordan!

For the separation from *C. cupreata* (HERRICH-SCHÄFFER, 1838) see HAUSMANN (1995). ELLISON & WILTSHIRE (1939) discussed the occurrence and the high variability of the species in Lebanon, the same also applies for Israel. However, HAUSMANN (1991) does not mention it for Jordan.

We could breed the species from eggs laid by a female caught in Wadi Rayyan. The larvae (Fig.4B) were fed with completely cut out, potted and advanced *Galium mollugo* plants.

***Catarhoe mosulensis* (SCHAWERDA, 1923)** (= *Euphyia sandosaria cinneretharia* AMSEL, 1935)
Wadi Rayyan (1); Dana Nature Reserve (2); Fayfa 23. III. 2009 (1).

***Larentia clavaria pallidata* STAUDINGER & REBEL, 1901**
Wadi Rayyan (1); Wadi Mujib (1).

***Nebula ablutaria* (BOISDUVAL, 1840)**
N Ajlun (1).

***Nebula ibericata numidiata* (STAUDINGER, 1892)**
Wadi Mujib (3); Al Tafila (1); Afra (2 KF.+16 LF.) (GU LL 27/09).
New for Jordan and Israel!

The specimens are rather small and pale, but similar specimens can sometimes be found in the Iberian subspecies of *N. ibericata ibericata* (STAUDINGER, 1871) and also in the Northwest African ssp. *numidiata*, especially in the autumn generation (Fig. 2H). In the male genitalia (Fig. 7A) there are no really distintive features like in most species-groups of *Nebula*. Although not reported from the Levant region before, there are three specimens in the STAUDINGER-collection (in ZMH Berlin) from "Jerusalem, Palästina and Jordanthal". The taxonomic status of the different populations can only be revealed by intensive investigations of all relevant morphological features and DNA barcoding from the whole distribution range (Iberian Peninsula, Canary Islands, North Africa and Near East) which was beyond the scope of this work.

***Gymnoscelis rufifasciata* (HAWORTH, 1809)**
Wadi Rayyan (2); Afra (1).

***Eupithecia ultimaria* BOISDUVAL, 1840**
Al Azraq (1) (GU LL 23/10); Fayfa 23. III. 2009 (1) (GU LL 24/10).
New for Jordan!

***Eupithecia minusculata* ALPHÉRAKY, 1881**
Rahma (1).

***Eupithecia schiefereri* BOHATSCH, 1893**
Dana Nature Reserve (15)
New for Jordan!

***Eupithecia dubiosa* DIETZE, 1910** (Fig. 1E)
N Ajlun (1)
New for Jordan?

***Eupithecia reisserata levarii* HAUSMANN, 1991**
Dana Nature Reserve (20).

The male genitalia are figured (Fig. 7B).

***Eupithecia maerkerata* SCHÜTZE, 1961** (Fig. 3F)
Fayfa (3).

***Eupithecia subextremata* SCHÜTZE, 1959** (Fig. 1D)
Dana Nature Reserve (10) (GU LL 22/10).
New for Jordan!
SCHÜTZE (1959) described from Jefren (Tripolitania) in Libya (February and March 1935/1936) *E. subextremata*, a species very closely related to *E. extremata* (FABRICIUS, 1787). It is distinguished from *E. extremata*, apart from the female genitalia (Fig. 7C), by the light yellow cream-coloured ground colour, the earlier flight-time and the, as far as known, allopatric distribution (Tunisia, Libya and Levant region, from the latter here reported for the first time).

***Eupithecia quercetica* PROUT, 1938** (Fig. 1F)
N Ajlun (1).

***Eupithecia jizlensis muelleri* HAUSMANN, 1991** (Fig. 3E)
Afra (1).

***Eupithecia irriguata staudingeri* BOHATSCH, 1893**
N Ajlun (3).

***Oulobophora externaria* (HERRICH-SCHÄFFER, 1848)**
N Ajlun (10).

***Coenina paulusi* (REBEL, 1906)**
Gharandal I (3); Fayfa (1).

***Pseudopanthera syriacata* (GUENÉE, 1857)**
N Ajlun (1).

***Odontopera jordanaria* (STAUDINGER, 1898) comb. nov.** (Fig. 3G, 3H)
Gharandal I (1); Al Tafila (1).
The larvae differ from the known larvae of *Crocallis* from which we could breed different species.
Larvae (Fig. 4C, 4D): Last instar (L5) 50mm long with typical bark markings. Patterning similar to *O. bidentata* (CLERCK, 1759) (only compared with a lateral view in STEINER 2003). Ground colour pure grey, no brownish tinge as in *bidentata*. Dorsale split, inconspicuously contrasting in a darker shade of grey, repeatingly enlarged in characteristic manner on each segment. Paramedian especially on segments 6 to 9 very characteristic, dark grey, crescent-shaped curvatures which, segmentally repeating, form an hour-glass-like pattern. Epistigmatale also furcated, caudad at first running straight without dilatation; the median sub-lines converge on the penultimate segment and fuse in the greyish black arrow spot on the apex of the protuberance. Spiracles pale yellow. Stigmatale indistinct, slightly paler than ground colour. Ventral area alternating mottled light and dark grey.
The caterpillars were reared from eggs (female from 10km east of Gharandal) with twigs of advanced florescences of *Prunus cerasifera* and *Lonicera tatarica*. According to characteristics of the larvae and genitalia (Fig. 7D) the species ought to be placed in the genus *Odontopera* STEPHENS, 1831, related to African species like *O. erebaria* GUENÉE, [1858]. A breeded male of *O. jordanaria* (Female from At Tafila) is figgured here (Fig. 4E).

***Dasycorsa modesta* (STAUDINGER, 1879)**
Awsarah (4); Wadi Rayyan (3); Afra (1).

***Perigune jordanaria* (STAUDINGER & REBEL, 1901)**
Awsarah (1).

***Zamarada torrida* FLETCHER, 1974**
Rahma (4); Gharandal I (1).

Aleucis spec. (nec *orientalis* (STAUDINGER, 1892)
Awsarah (5); Wadi Rayyan (1); N Ajlun (1).
This species, occurring in the Near East, is different from the Anatolian *A. orientalis* (STAUDINGER, 1892). The description of it is in preparation (STÜNING and HAUSMANN pers. comm.).

***Acanthovalva inconspicuaria* (HÜBNER, [1819])** (= *A. pumicaria* LEDERER, 1853)
Ajlun-Hotel (1); Awsarah (1); Dana Nature Reserve (2).

***Isturgia exustaria* (STAUDINGER, 1897)** (Fig. 1H)
Wadi Rayyan (1); Gharandal I (3); Fayfa (2); Afra (2); Fayfa 23. III. 2009 (2).

***Isturgia disputaria* (GUENÉE, [1858])**
Gharandal I (1).

***Isturgia perviaria* (LEDERER, 1855)**
Rahma (1).

***Chiasmia syriacaria* (STAUDINGER, 1871)**
Fayfa 23. III. 2009 (3).

***Biston achyra* WEHRLI, 1936** (Fig. 1C)
N Ajlun (1).

***Apochima flabellaria* (HEEGER, 1838)** (Fig. 7E)
Ajlun (1); Awsarah (8); Wadi Rayyan (3); Wadi Mujib (7); Afra (1).

***Agriopis bajaria* ([DENIS & SCHIFFERMÜLLER], 1775)**
Wadi Rayyan (2).

***Desertobia heloxylonia lawrencei* ssp. n.** (Fig. 3A-C)

Holotype: ♂ JORDAN, Prov. Ma'an, Wadi Rum area, E Aqaba, 2km N Tourist Information (Visitor) Center, N 29°40'18'', E 35°28'30'', ca. 830m, 26. XII. 2008, leg. L. LEHMANN & D. STADIE (coll. ZSM)

Paratypes: 1♂ JORDAN, Prov. Ma'an, Wadi Rum area, E Aqaba, E Tourist Information (Visitor) Centre, N 29°40, E 35°25, ca. 830m, 26. XII. 2008, leg. L. LEHMANN & D. STADIE; 2♂ JORDAN, Prov. Ma'an, Wadi Rum area, E Aqaba, 3km W Tourist Information (Visitor) Centre, N 29°40'59'', E 35°25'12'', ca. 920m, 26. XII. 2008, leg. L. LEHMANN & D. STADIE (paratypes in coll. STADIE & LEHMANN).

Description. Wingspan 19-20 mm, forewing length 11-12.5 mm. Head. Vertex and frons pale yellowish-grey, with a patch of brown scales in the middle. Antenna ciliate, pale yellowish-grey, darker on the underside.

Thorax and abdomen yellowish grey-brown. Underside of abdomen grey-white. Legs long and slender, hindtibia with two pairs of spurs. Forewing elongated with straight costa and rounded apex. Ground colour pale yellowish grey-brown, densely irrorated with brown scales. Three nearly parallel, mostly straight lines. Antemedial line diffuse near costa and bent toward wing base. Postmedial line with a diffuse dark shadow of brown scales on the inner side, reaching apex. Discal spot a thin line of black-brown scales, fused with medial line. Hindwing grey-white, sprinkled with brown scales at anal margin where antemedial and postmedial line begin. One specimen with a brown discal spot. Fringes very long, yellowish, dusted grey-brown except for the tips. Underside dull white, yellowish diffused mainly on forewing costa and apex, less densely irrorated with brown scales. Lines barely visible, specimens without discal spots nearly immaculate.

Male genitalia (Fig. 7F). Uncus triangular, sclerotized. Gnathos sclerotized. Valva broad, tapering, with a triangular, sclerotized process at the end of sacculus, and with a sclerotized patch of spines subapically. Juxta rounded, with a pair of long, band-like, strongly sclerotized processes. Saccus developed, rounded. Aedeagus with a sclerotized, pointed process at the apex.

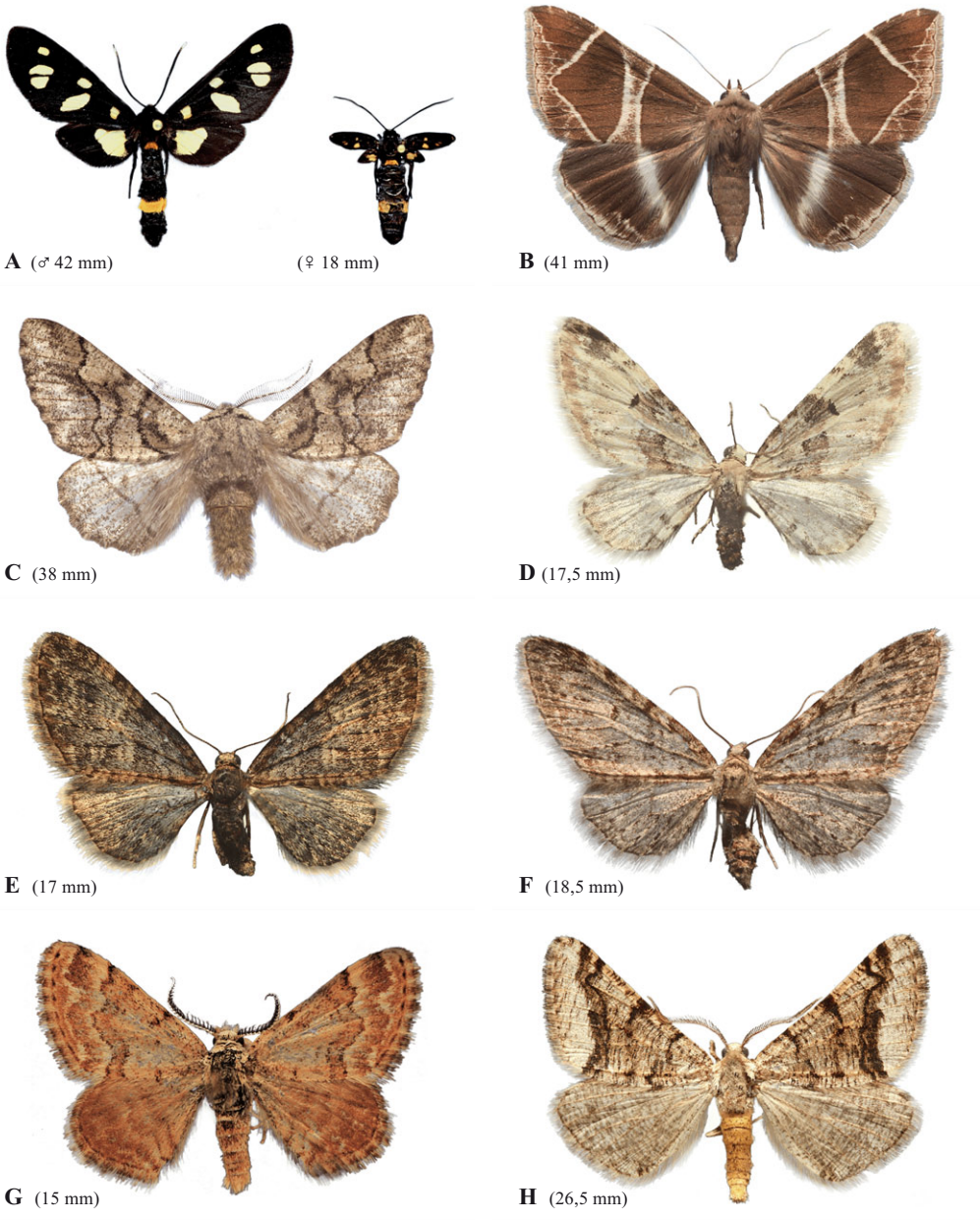
Female. Unknown. The females of *Desertobia nocturna* VIIDALEPP, 1989 (Fig. 3D, bottom left) and *Desertobia heloxylonia heloxylonia* XUE, SHUE, XING, HAN & LI, 2006 are wingless.

Diagnosis. *Desertobia heloxylonia lawrencei* **ssp. n.** is easily distinguished in male genitalia from *Desertobia nocturna* VIIDALEPP, 1989 and *Desertobia kozlovae* VIIDALEPP, 1989 by having a sclerotized, pointed process at the posterior end of the aedeagus. Externally it differs from both species by the paler yellowish grey-brown ground colour and the straighter postmedial line of the forewing.

The new subspecies surprisingly proofed to be very similar to the recently described *Desertobia heloxylonia* XUE, SHUE, XING, HAN & LI, 2006 from Xinjiang, China. Head, thorax, abdomen and wing pattern are not different from *D. heloxylonia heloxylonia*. Both wings stronger and more evenly diffused yellowish. All wings on upper and underside more densely irrorated with brown scales. Only one of the four specimens with a discal spot on the hindwing. Male genitalia also nearly indistinguishable from *D. heloxylonia*. Sclerotized patch of spines subapically, ampulla longer with stronger spines. The pair of long, sclerotized processes of the juxta with the same width in the main part, not slightly expanded in the middle. Saccus appears more rounded. Aedeagus straighter at the posterior end and slightly arcuated towards apex.

Distribution. Only known from the type locality in South Jordan. It is separated from the type locality of *D. heloxylonia* by a distance of more than 5000km and from the nearest known population of *D. heloxylonia* in Afghanistan by more than 2700km.

Remark. The species was described just recently and was only reported from Northwest China (XUE et al. 2006, LI et al. 2007). In the collections of the Staatliches Museum für Naturkunde Karlsruhe (SMNK) we could find ten specimens from Afghanistan which proofed to belong to *heloxylonia*.



A (♂ 42 mm) (♀ 18 mm) **B** (41 mm)

C (38 mm) **D** (17,5 mm)

E (17 mm) **F** (18,5 mm)

G (15 mm) **H** (26,5 mm)

Fig 1: Imagines (mm = wing span)
A: ♂ and ♀ of *Amata mestralii* (BUGNION, 1837), Prov. Balqa, Al Rumaymin, vicinity of Suwaylih, 600m, ex ovo
B: ♂ of *Dysgonia rogenhoferi* (BOHATSCH, 1880), Prov. Tafila, SE Fayfa, Richtung Al Tafila, 50m, 23.III., 2009
C: ♂ of *Biston achyra* WEHRLI, 1936, Prov. Irbid, Ajlun Forst Reserve, 8km N Ajlun, 1000m, 22. III. 2009
D: ♀ of *Eupithecia subextremata* SCHÜTZE, 1959, Prov. Tafila, Dana Nature Reserve, Hamra Valley, 900m, 20. III. 2009
E: ♀ of *Eupithecia dubiosa* DIETZE, 1910, Prov. Irbid, Ajlun Forst Reserve, 8km N Ajlun, 1000m, 22. III. 2009
F: ♀ of *Eupithecia quercetica* PROUT, 1938, Prov. Irbid, Ajlun Forst Reserve, 8km N Ajlun, 1000m, 22. III. 2009
G: ♂ of *Oar pratana mortuaria* (STAUDINGER, 1898), Prov. Tafila, SE Fayfa, towards Al Tafila, 50m, 23. III. 2009
H: ♂ of *Isturgia exustaria* (STAUDINGER, 1897), Prov. Tafila, SE Fayfa, towards Al Tafila, 50m, 23. III. 2009

All specimens collected and photographed by Steffen SCHELLHORN.

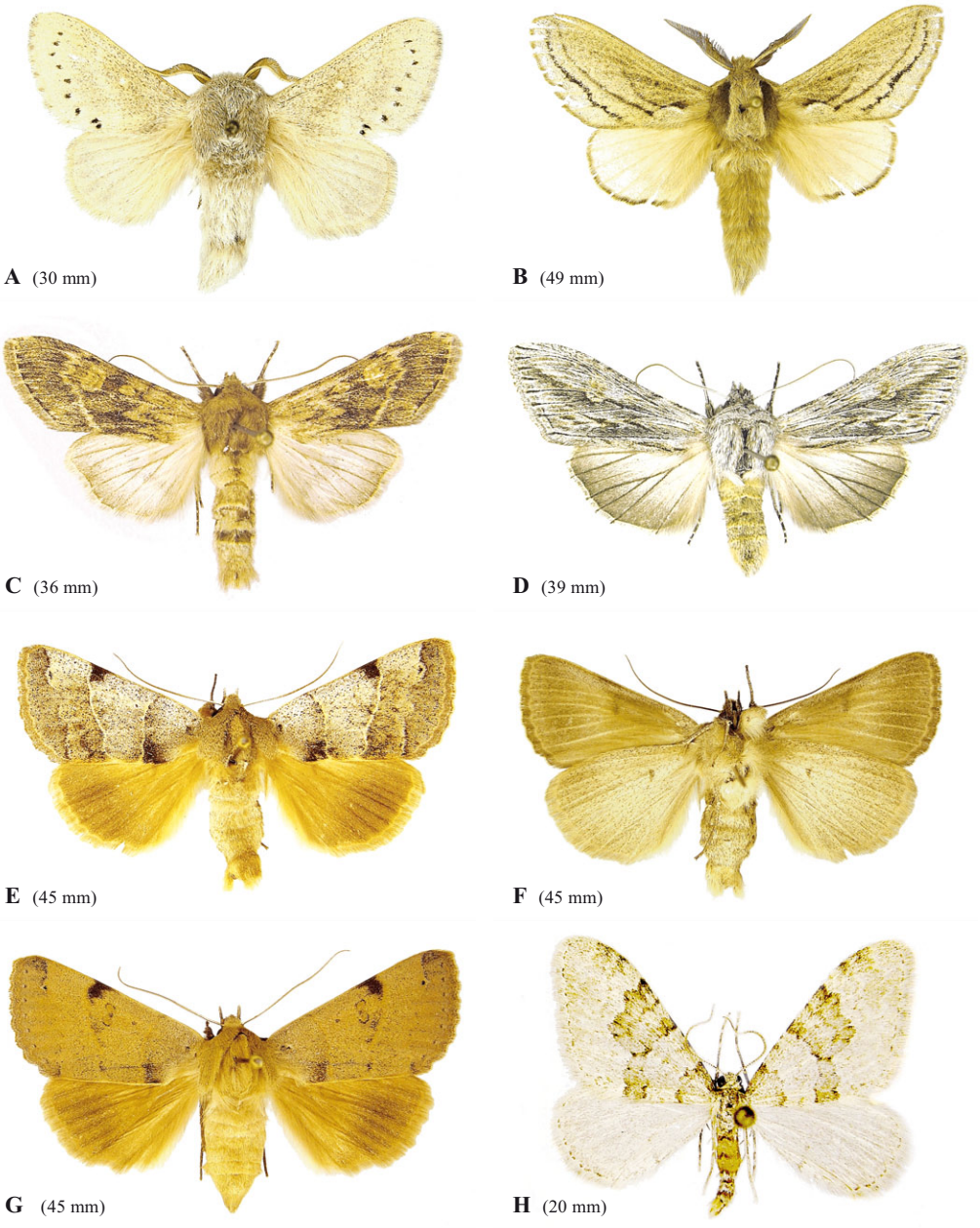


Fig. 2: Imagines (mm = wing span)
A: ♂ of *Bufoidia ledereri* (KOÇAK, 1981), Prov. Irbid, Ajlun Forst Reserve, 8km N Ajlun, 1000m, 22. III. 2009
B: ♂ of *Stoermeriana nabataea* DE FREINA, 2002, Prov. Tafila, Dana Nature Reserve, Hamra Valley, 900m, 20. III. 2009
C: ♂ of *Cucullia macara* REBEL, 1947, Prov. Tafila, SE Fayfa, towards Al Tafila, 50m, 28. XII. 2008
D: ♂ of *Cucullia syrtana* MABILLE, 1888, Prov. Tafila, SE Fayfa, towards Al Tafila, 50m, 28. XII. 2008
E: ♂ of *Minucia wiskotti* (PÜNGELER, 1902),Prov. Tafila, Dana Nature Reserve, Hamra Valley, 900m, 20. III. 2009
F: same specimen, underside
G: ♀ of *Minucia wiskotti* (PÜNGELER, 1902), Prov. Tafila, Dana Nature Reserve, Hamra Valley, 900m, 20. III. 2009
H: ♂ of *Nebula ibericata numidiata* (STAUDINGER, 1892), Prov. Tafila, NE Al Tafila, 2km SE Afra, 650-700m, 29. XII. 2008

Specimens of *Bufoidia ledereri*, *Stoermeriana nabataea* and *Minucia wiskotti* collected by Steffen SCHELLHORN, all other specimens collected by Dirk STADIE & Lutz LEHMANN. Photos by Hans LÖBEL.

Collecting dates: 6♂ Afghanistan, Ainak, Ghaz, 13. 1. 1971, leg. C. NAUMANN; 1♂ S-Afghanistan, Pr. Helmand, Registan, 50km sdl. [south of] Dishu, Haloxilon-Steppe, 22. 1. 1971, alt. 1000 Meter, leg. C. NAUMANN and 3♂ S-Afghanistan, Pr. Helmand, Registan, 30km sdl. [south of] Dishu, Haloxilon-Steppe, 23. 1. 1971, alt. 1000 Meter, leg. C. NAUMANN (GU 3308/4 and 3308/5 U. RATZEL).

This interesting series considerably enlarges the known distribution and also the knowledge of the variability of the species. There aren't two specimens exactly alike. They especially differ in the irroration with dark scales and the development of the antemedial and postmedial line. All specimens have more or less recognizable discal spots on the hindwings. There is a single male *Desertobia* from NE Iran in the collection of the ZSM Munich (HAUSMANN pers. comm.).

Life history. The type series was collected at the end of the December at two close places in the Wadi Rum desert on stony ground with patches of sand dunes. Nothing else is known about the biology of the new subspecies. *D. heloxylonia* is reported to feed on *Haloxylon persicum* BUNGE EX BOISS. ET BUHSE, *H. ammodendron* (C.A.MEY.) BUNGE, *Calligonum leucocladum* (SCHRENK) BUNGE and *C. mongolicum* TURCZ., causing damage to its main hostplant *Haloxylon persicum* (XUE et al. 2006; LI et al. 2007). Potential hostplants for *Desertobia heloxylonia lawrencei* **ssp. n.** are most likely, according to the reports on *D. heloxylonia heloxylonia* (XUE et al. 2006; LI et al. 2007) *Haloxylon persicum* BUNGE EX BOISS. ET BUHSE, *Haloxylon salicornicum* (MOQ.) BUNGE EX BOISS. and *Calligonum comosum* L'HER.. These plants are very typical for the winter humid, northern and central sand deserts of the Arabian Peninsula. They are dominant plants of the *Haloyxlon persicum-Artemisia monosperma-Stipagrostis darii*-plant society (Red Sand Community) and of the *Calligonum comosum-Artemisia monosperma-Scrophularia hypericifolia*-plant community, the prevailing vegetative ecotypes of these areas. They are distributed in The Great Nafud, The Dhana, Central Sand Seas and The Jafurah (MANDAVILLE 1998). An occurrence of *Desertobia heloxylonia lawrencei* on the Arabian Peninsula up to 25° northern latitude, the southern limit of the distribution of these plant communities (MANDAVILLE l.c.), would be possible.

Derivatio nominis. The subspecies is named after the famous British officer T.E. LAWRENCE, known as Lawrence of Arabia, who stayed several times in the area of the type locality where also parts of the film (1962) based on his life were taken.

Taxonomic remark. The genus *Desertobia* VIIDALEPP, 1989 consists of the following three species *D. nocturna* VIIDALEPP, 1989 (Fig. 3D, left), *D. kozlovae* VIIDALEPP, 1989 (Fig. 3D, right) and *D. heloxylonia* XUE, SHUE, XING, HAN & LI, 2006. VIIDALEPP (1989), when describing the genus, also erected a new monotypic tribe Desertobiini as sister taxon to the tribe group Bistonini+Boarmiini. In his description of the new genus and species *Semidesertobia ubinica* BELJAEV (2000) proofed the cladistic arguments for a separate tribe and eventually sunk Desertobiini into synonymy of Boarmiini in a broad concept.

***Kemtrognophos onustarius eugonius* WEHRLI, 1953**
N Ajlun (1).

***Euchrognophos sacraria* (STAUDINGER, 1894)**
Awsarah (1); ?Fayfa (1).

***Cnestrognophos luticiliatus claytoni* (WILTSHIRE, 1949)**
Fayfa 23. III. 2009 (1).

Noctuoidea

Nolidae

***Garella nilotica* (ROGENHOFER, 1882)**
Wadi Mujib (1).
Just recently reported as new for Jordan (MÜLLER et al. 2010).

***Earias insulana* (BOISDUVAL, 1833)**
Fayfa (3).

Arctiidae

***Eilema muscula* (STAUDINGER, 1899)**
Fayfa 23. III. 2009 (2).

***Amata mestralii* (BUGNION, 1837)** (Fig. 1A)
Al Rumaymin (20).
The species was reared by feeding the caterpillars (Fig. 4F) with leaves of *Taraxacum* cf. *officinale* and *Lactuca sativa* in Germany.

***Ocnogyna loewii* (Zeller, 1846)**
Wadi Mujib (1); Afra (1); Ajlun-Khirbet (larvae common); Al Rumaymin (larvae common).

***Creataloum arabicum* (Hampson, 1896)**
Fayfa 23. III. 2009 (15).

***Utetheisa pulchella* (Linnaeus, 1758)**
Gharandal I (1); Fayfa 23. III. 2009 (1).

Lymantriidae

***Euproctis fasciata susanna* (Staudinger, 1895)**
Gharandal I (2)
Wiltshire (1990) provisionally treated *E. fasciata* (Walker, 1855) described from South Africa and *E. susanna* Staudinger (1895) described from Palestine as subspecies, geographically separated on the Arabian Peninsula. Both are externally rather different. As we have material of both forms from the same area (South Oman, vicinity of Salalah) the taxonomic status of *E. susanna* has to be re-evaluated.
New for Jordan?

***Casama innotata* (Walker, 1855)**
Rahma (6); Gharandal I (7); Fayfa 23. III. 2009 (6).

Noctuidae

***Eublemma cochylioides* (Guénée, 1852)**
Afra (1).

***Eublemma ostrina* (Hübner, [1808])**
Wadi Rayyan (1); Fayfa (1); Dana Nature Reserve (4); Fayfa 23. III. 2009 (1).

***Eublemma parva* (Hübner, [1808])**
Fayfa (1); Fayfa 23. III. 2009 (1).

***Metachrostis velocior deserta* (Amsel, 1935)**
Fayfa 23. III. 2009 (2).

***Tathorhynchus exsiccata* (Lederer, 1855)**
Gharandal II (1).

***Autophila pauli* Boursin, 1940**
Rahma (1); Gharandal I (1); Fayfa (1); Al Azraq (1); Dana Nature Reserve (1).

***Scodionyx mysticus* Staudinger, 1900**
Rahma (1); Gharandal I (3).

***Tytroca dispar* (Püngeler, 1904)**
Rahma (9); Fayfa 23. III. 2009 (1).

***Tytroca leucoptera* (Hampson, 1896)**
Rahma (3#W).

***Gnamptonyx innexa* (Walker, 1858)**
Rahma (1).

***Pandesma robusta* Walker, 1858**
Wadi Rum I (1); Fayfa (1); Fayfa 23. III. 2009 (6).

***Ophiusa tirhaca* (Cramer, 1777)**
Al Azraq (1).

***Minucia wiskotti* (Püngeler, 1902)** (Fig. 2E-G)
Dana Nature Reserve (150).
Larvae (Fig. 4G): Head: Bp P1 at the acute cephalad tip of the whitish coronal stripe, P2 at its ventral margin; areas between the coronal stripes and between the coronal stripe and the yellowish-white gena violet-brown (inconspicuously netted darker). A longitudinal white stripe in the frontal area from the level of the basis of the adfrontalia (=AF) to AF-tip, width ½ to 1 AF2-AF2 (AF2 is the caudad bristle of the two AF-bristles); a further less striking and blurred-edged longitudinal stripe from A1, A2 (the two bristles in the zone anterior ventrolateral from AF, approximately on the F1-level, both on a longitudinal line) caudad to transversal line/AF2. AF plain whitish. All these whitish stripes narrowly and blurred-

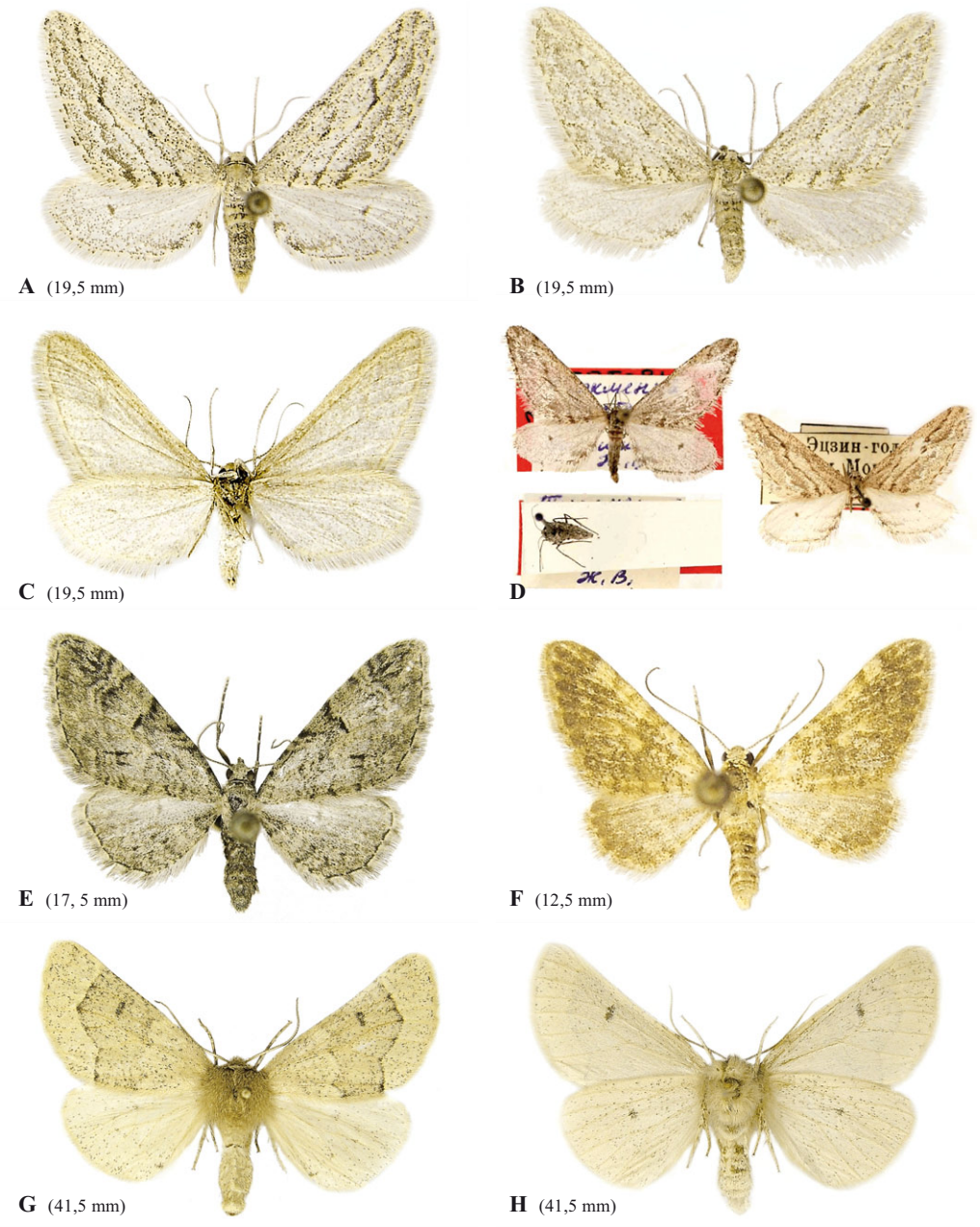


Fig. 3: Imagines (mm = wing span)

A: ♂ paratype of *Desertobia heloxylonia lawrencei* LEHMANN & STADIE, 2011, Prov. Maan, Wadi Rum area, E Aqaba, 3km W Tourist Information (Visitor) Centre, 920m, 26. XII. 2008
B: ♂ paratype of *Desertobia heloxylonia lawrencei* LEHMANN & STADIE, 2011, dto., 2km N, 830m, 26. XII. 2008,
C: same specimen, underside
D: *Desertobia nocturna* VIIDALEPP, 1989, top left ♂ type, bottom left ♀ paratype; *Desertobia kozlovae* VIIDALEPP, 1989, right ♂ type , (ZISP) (photo Dieter STÜNING)
E: ♀ of *Eupithecia jizlensis muelleri* HAUSMANN, 1991, Prov. Tafila, NE Al Tafila, 2km SE Afra, 650-700m, 29. XII. 2008
F: ♀ of *Eupithecia maerkerata* SCHÜTZE, 1961, Prov. Tafila, SE Fayfa, towards Al Tafila, 50m, 28. XII. 2008
G: ♀ of *Odontopera jordanaria* (STAUDINGER, 1898), Prov. Tafila, SE Fayfa, towards Al Tafila, 50m, e.o., 28. XII. 2008
H: same specimen, underside
All specimens collected by Dirk STADIE & Lutz LEHMANN. Photos by Hans LÖBEL, except photo D (by D. STÜNING).

edged margined violet-brown; as a whole the frontal area of the head is bright; Frons pale, centrally longitudinal and caudad to transversal line/AF1 with dark elements.

Body: primary lines (the marginal stripes of the split dorsal line) all of the same width (1/3D1-D1,S1) whitish with one to two series of orange-brown P-, L-elements, bordered by the dark, blackish zones (at the dorsal line by the dark central stripe); ground colour of the zones greyish-beige, densely packed with black disordered L-elements (in the dorsal zone up to 7 elements side by side), contrary to *Minucia bimaculata* OSTHELDER, 1933 the two marginal stripes of the dorsal line contact in the S-center, forming one 'X'/S. On S1, the whitish eye-spot (between D1 and D2) is ventrally bordered rectangular compact black by the dorsal zone. Visible to the naked eye the dorsal zone bears intersegmentally enlarged blackish stripes (from 'X' to 'X') which together with the opposite zone enclose one pale greyish rhomb/S (centrally split by the dark dorsal line), most striking on S1/S2, S2/S3, S6/S7 and S7/S8. Spiracles above the stigmatal line and touching this line.

Concerning the used terminology compare BECK (1991, 1999, 2000). **Abbreviations**: S1-S10 = abdominal segments; SI-SIII = thoracic segments; Bp/Bps = bristle-point(s), D = dorsal bristles; L = lateral bristles. Ns = neck-shield (or prothoracic shield on SI). D1-D1,SI: terms the caudad bps on Ns, closest to the dorsal line and the distance of these to which the width of the dorsal line and subdorsal line on Ns are referred to. As =anal-shield (on S10). D1 is the cephalad Bp, closest to the dorsal line; the width of the dorsal line or subdorsal line on S10 are refered to the distance D1-D1, S10.

The larvae were reared on advanced *Quercus* twigs in Germany in spring 2008. Although reported by WILTSHIRE (1952) as feeding on *Pistacia mutica* in Southwest Iran (Fars), larvae of the species *Minucia bimaculata* OSTHELDER, 1933 were found on *Quercus* by us in South Turkey and the species was also bred successfully on *Quercus* in Germany.

***Clytie sancta* (STAUDINGER, 1898)**
Fayfa 23. III. 2009 (12).

***Clytie scotorrhiza* HAMPSON, 1913**
Fayfa 23. III. 2009 (1)
New for Jordan!

***Dysgonia rogenhoferi* (BOHATSCH, 1880)** (Fig. 1B)
Fayfa 23. III. 2009 (1).

***Grammodes boisdeffrii palaestinensis* (STAUDINGER, 1898)**
Fayfa 23. III. 2009 (1).

***Trichoplusia ni* (HÜBNER, 1803)**
Wadi Mujib (1); Gharandal I (2); Fayfa (1); Al Azraq (1); Dana Nature Reserve (1).

***Thysanoplusia circumscripta* (FREYER, 1831)**
Wadi Rayyan (2).

***Chrysodeixis chalcites* (ESPER, [1789])**
Wadi Rayyan (1); Wadi Mujib (4); Gharandal I (1); Fayfa (1); Fayfa 23. III. 2009 (2).

***Autographa gamma* (LINNAEUS, 1758)**
Ajlun-Hotel (1); Awsarah (2); Wadi Mujib (5); Fayfa (1).

***Cornutiplusia circumflexa* (LINNAEUS, 1767)**
Gharandal I (1).

***Simyra dentinosa* FREYER, 1839**
1km W Swami'a, E Al-Tafila, 1200m, 28. XII. 2008, a nest of gregarious L1-larvae on *Euphorbia* (reared, (Fig. 4H); Afra (4).

***Cucullia santolinae* RAMBUR, 1834**
Al Tafila (2); Afra (4); Dana Nature Reserve (10).
The taxon *C.amoenissima* OBERTHÜR, 1918 (= *C.amaenissima*), formerly treated as subspecies, distributed from Algeria to the Near East, was considered as synonym by RONKAY & RONKAY (2009).

***Cucullia calendulae* TREITSCHKE, 1835**
Wadi Rayyan (1).

***Cucullia syrtana* MABILLE , 1888** (Fig. 2D)
Gharandal I (2); Fayfa (2).

***Cucullia macara* REBEL, 1947** (Fig. 2C)

Wadi Mujib (1); Fayfa (5); Al Tafila (2).
The taxon *benderi* BOURSIN, 1963, formerly treated as subspecies, was considered as synonym by RONKAY & RONKAY (2009).

***Cleonymia chabordis* (OBERTHÜR, 1876)**
Fayfa 23. III. 2009 (2).

***Xylocampa hethitica* KOBES & PINKER, 1976**
Awsarah (1); N Ajlun (5).
After recent studies the taxon merrits species rank (RONKAY & RONKAY 2011).

***Metalopha gloriosa ingloria* DRAUDT, 1933**
Al Rumaymin (1).

***Rhabinopteryx subtilis* (MABILLE, 1888)**
Fayfa 23. III. 2009 (1).

***Allophyes benedictina* (STAUDINGER, 1892)**
Ajlun (3); Awsarah (1); Wadi Rayyan (7).

Larvae (Fig. 6A): Appearance very close to the other taxa of the genus (see BECK 2000, B257, B258x-y). Possible differences are herewith to described, examining only one larva. Similar to *A. alfaroi* AGENJO, 1951, the whole lateral area from transversal line/D2,S3 to the S6 caudad margin is pale greyish-brownish, otherwise the body is (orange) medium greyish-brown. Ns-cephalad-edge not black, there the white Bp-spots of XD1 and XD2, diameter of each 1/3-1/2 D1-D1,SI; on the level of the epistigmatal line also a bristleless white spot on the cephalad S-margin, three times the width of the XD1- and XD2-base-spots on SI. D1- and D2-wart on S1 in size, diameter and height each 1/6 D1-D1,S1 (in the other *Allophyes*-spp. the D1-wart is smaller than the D2-wart). The hump on S8 pyramid-stump-like, its height up to wart-D1, this wart is not larger than wart-D1,S1; wart-S8,D2 two-three times larger than wart D1, S8. The white diagonal ribbon on S1,S2 starts at MD1,S2, running cephalad to wart D2,S1, this one including and then vertically to the stigma and L2; on the stigma-level and on the levels of the subdorsal line and the epistigmatal line it is cephalad and caudad rectangularly enlarged. On S7 a blackish connection from D2 to SD1 (as in *A. oxyacanthae* LINNAEUS, 1758). On S7, S8 the ventral border-line (on the L2-level) of the centrally ground colored stigmatal line is black double-edged and filled blackish in between. Prolegs with black base-spots of SV1, SV2.

The caterpillars were reared from eggs (female from 1km east of Ajlun) with twigs of advanced blossoms of *Crataegus monogyna* and *Prunus cerasifera*.

***Heliothis peltigera* ([DENIS & SCHIFFERMÜLLER], 1775)**
Wadi Rayyan (1); Fayfa (1).

***Heliothis nubigera* HERRICH-SCHÄFFER, 1851**
Wadi Mujib (1 on sugar baits); Fayfa (1); Al Azraq (3); Dana Nature Reserve (20); Fayfa 23. III. 2009 (15).

***Helicoverpa armigera* (HÜBNER, [1808])**
Wadi Mujib (4); Rahma (1); Fayfa (3); Dana Nature Reserve (1); Fayfa 23. III. 2009 (8).

***Condica viscosa* (FREYER, 1831)**
Afra (2).

***Callopistria latreillei* (DUPONCHEL, 1827)**
Wadi Rayyan (4)
New for Jordan!

***Spodoptera exigua* (HÜBNER, [1808])**
Awsarah (1); Wadi Rayyan (4); Wadi Mujib (29); Rahma (11); Gharandal I (3); Fayfa (ca. 55); Afra (15); Al Azraq (1); Dana Nature Reserve (15); Fayfa 23. III. 2009 (20).

***Spodoptera cilium* (GUENÉE, 1852)**
Awsarah (1); Wadi Rayyan (1).

***Spodoptera littoralis* (BOISDUVAL, 1833)**
Wadi Mujib (3); Rahma (1).

***Caradrina ingrata* STAUDINGER, 1897**
Fayfa (4); Afra (1).

***Caradrina flava* Oberthür, 1876**
Dana Nature Reserve (20); Fayfa 23. III. 2009 (40).

***Caradrina bodenheimeri* (Draudt, 1934)**
Wadi Mujib (1); Dana Nature Reserve (1); Fayfa 23. III. 2009 (1).

***Caradrina flavirena* Guénée, 1852**
N Ajlun (1) (GU LL 21/10).

***Eremotrachea bacheri* (Püngeler, 1902)**
Wadi Mujib (7); Rahma (1); Gharandal II (1); Fayfa (9); Al Tafila (4); Afra (1).

***Sesamia cretica* Lederer, 1857**
Fayfa (1)

***Spudaea castanea* Osthelder, 1933** (= *pontica* Klyuchko, 1968)
Ajlun (1)
New for Jordan!

***Agrochola lychnidis* ([Denis & Schiffermüller], 1775)**
Ajlun (ca.80 on sugar baits+40 at light); Ajlun-Hotel (8); Awsarah (25 on sugar baits+35 at light); Wadi Rayyan (14 on sugar baits +20 at light); Wadi Mujib (1); Afra (7).

***Agrochola pauli* (Staudinger, 1892)** (Fig. 5B)
Ajlun (3); Ajlun-Hotel (1); Awsarah (8 on sugar baits +18 at light); Wadi Rayyan (1 on sugar baits +21 at light).

Larvae (Fig. 5A): Very similar to a reddish-brown form of *A. lychnidis* from Crete. Differences: The large (width 1/4-1/3 D1-D1,S1) dark stripe, equally on both sides of the subdorsal line, touches the whitish D2-full-spot (diameter 1/10-1/8); within the dark stripe the dull whitish, drizzled-punctured subdorsal line (1/20) is hardly visible. Dorsal line like the subdorsal line but more distinct (1/15), on both sides bordered dark, each side 1/15-1/10. Dorsal zone with less distinct, blurred-edged rhombic pattern (1/S), zones homogeneously, but irregularly netted dark red brown, mashes pale whitish-beige.

In *A. lychnidis* (compared with the reddish-brown larva from Crete) the zones are homogeneously set by longitudinals and alternating red-brown and whitish LI-Elem; rhombes are absent in the dorsal zone. The dark ribbon in position of the subdorsal line is distant from the white D2-fullspots (diameter each 1/8) in the width of these. In both taxa there is a similar black cap (on SII, SIII dorsal from L3) above the white L1-Bp-base-spot.

Remark: Ronkay & et al. (2001) put *A. pauli* and *A. scabra* into the '*kindermanni (wolfschlägeri)*'-species-group. *A. pauli* differs from *A. kindermanni* (Fischer von Röslerstamm, 1838) by the dark rhombic pattern in the dorsal zone which is lacking in *A. kindermanni*.

***Agrochola scabra* (Staudinger, 1892)** (Fig. 5E, 7G)
Wadi Mujib (2); Afra (7 on sugar baits +45 at light).

Larvae (Fig. 5C,D): The description of the larvae of *Agrochola kindermanni* (Fischer von Rössler-stamm, 1838) by Wiltshire in Seitz Supplement (1938, p. 258) probably refers to *A. scabra* (Beck, pers. comm.). All forms of *A. scabra* show a greenish ventral zone (ventral of the basis of the prolegs) or in the greenish form the greenish ventral region. Similar to the description by Wiltshire (1938) there are greenish (Fig. 5D) und reddish-brown (Fig. 5C) forms. The reddish-brown form is very similar to the larvae of *Agrochola helvola* (Linnaeus, 1758) but differs by the completely plain white (to pale yellowish) stigmatal line (width 1 L1-L2,S1) which is sharp-edged on both sides, whereas in the latter the ventral region is completely reddish-brown and merges into the Stigmatale up to its stigmatal suture (that is about half the height of L1-L2). In both taxa the Bp-base-spots are plain white and large, diameter 1/7-1/6. The black cap of L1-Bp-base-spot is conspicuous, more in the greenish-greyish form, but always missing in the larvae of *A. helvola*.

This and the preceding species were reared in Germany (females from Wadi Rayyan) with twigs of advanced florescence of *Prunus cerasifera*. Contrary to *A. pauli* and *A. staudingeri*, breeding of *A. scabra* proofed to be very difficult and failed completely in the last instar. Perhaps the offered food was too distantly related to the natural unknown food plant.

***Agrochola macilenta rubrescens* (Wiltshire, 1939)**
Ajlun (8 on sugar baits +3 at light)
New for Jordan!

Fig 4: Larvae, reared and living moths

A: *Scopula luridata* (ZELLER, 1847) reared ♂, Prov. Irbid, canyon of Wadi Rayyan
B: *Catarhoe hortulanaria palaestinensis* (STAUDINGER, 1894) larvae, reared from egg, last instar L5, Prov. Irbid, dto.
C: *Odontopera jordanaria* (STAUDINGER, 1898) larvae, reared from egg, instar L3, Prov. Ma'an, road Dilagha-Gharandal, ca. 10km E Gharandal
D: *Odontopera jordanaria* (STAUDINGER, 1898) larvae, reared from egg, last instar L5, dto.
E: *Odontopera jordanaria* (STAUDINGER, 1898) reared ♂, Prov. Ma'an, road Dilagha-Gharandal, ca. 10km E Gharandal
F: *Amata mestralii* (BUGNION, 1837) larvae, reared from egg, last instar L5, Prov. Balqa, Al Rumaymin, vicinity of Suwaylih
G: *Minucia wiskotti* (PÜNGELER, 1902) larvae, reared from egg, last instar L5-1, Prov. Tafila, Dana Nat. Res., Hamra Valley
H: *Simyra dentinosa* FREYER, 1839 L5 larvae, Prov. Tafila, 1km W Swami'a, E Al-Tafila, 1200m, 28. XII. 2008

All leg. cult. & photos D. STADIE (except *Amata mestralii* and *Minucia wiskotti*: leg. S. SCHELLHORN).

Fig 5: Larvae, reared and living moths

A: *Agrochola pauli* (STAUDINGER, 1892) larvae, reared from egg, last instar L5, Prov. Irbid, canyon of Wadi Rayyan
B: *Agrochola pauli* (STAUDINGER, 1892) reared ♂, Prov. Irbid, canyon of Wadi Rayyan
C: *Agrochola scabra* (STAUDINGER, 1892) larvae (brown form), reared from egg, last instar L5-1, Prov. Tafila, 2km SE Afra
D: *Agrochola scabra* (STAUDINGER, 1892) larvae (green form), reared from egg, last instar L5-2, Prov. Tafila, 2km SE Afra
E: *Agrochola scabra* (STAUDINGER, 1892) reared specimen, Prov. Tafila, 2km SE Afra
F: *Agrochola staudingeri* RONKAY, 1984 larvae, reared from egg, instar L4, Prov. Irbid, canyon of Wadi Rayyan
G: *Agrochola staudingeri* RONKAY, 1984 larvae, reared from egg, last instar L5, Prov. Irbid, canyon of Wadi Rayyan
H: *Agrochola staudingeri* RONKAY, 1984 reared ♂, Prov. Irbid, canyon of Wadi Rayyan

All leg., cult. & photos D. STADIE

***Agrochola staudingeri* Ronkay, 1984** (Fig. 5H)

Ajlun (1); Awsarah (5 on sugar baits +6 at light); Afra (1 on sugar baits +2 at light).

Larvae (Fig. 5F, 5G): L1- to L3-instars pale green, very striking is the large, whitish D2-base-spot (diameter twice the diameter of the large D1-base-spot), which is completely united on SII and SIII ventral with the subdorsal line and which on S1 to S6 extends into the subdorsal line. L4: Zones pale greyish-includes greenish, the primary lines (dorsal line 1/15-1/10, caudad S3 1/10-1/8, subdorsal line 1/10-1/8 and the margins of the stigmatal line, each ¼ of the width L1-L2) whitish, drizzled-punctured. epistigmatal line absent. Diameter of the Bp-base-spots: D1 ¼-1/3, D2 1 1/3 to 1 ½ of the D1-diameter.

LL-(and VL-) instar: appearance blackish-brown to lilac-grey-brown. Ns: Bp-base-spots XD1,D1 dull whitish, diameter 1/5 D1-D1,SI. Most striking is the large (1/2-3/5) plain white subdorsal line, starting cephalad of the pale greyish-greenish D2-base-spot; D2 on the mid-level of the subdorsal line (in Noctuidae normally above the subdorsal line).

Body: on S1-S8 the large, plain white D2-base-pots are prominent, dorsocephal bordered in black, extended to D1 and beyond D1 to the cephal margin of S; on S1 the transversal diameter of the D2-base-spot is ½, the longitudinal diameter ¼ D1-D1, S1; D1-base-spot, contrary to *A. mansueta* (Herrich-Schäffer, 1850), inconspicuous, dull whitish, diameter 1/20-1/15. Subdorsal line on As vague, dull whitish, 1/6 D1-D1, S10, from cephal margin of S to D1 longitudinal straight (or further, to SD1). Bp-base-spots SD1, L1 (on S1-S8) as D1, L2 longitudinal-oval, plain white, length twice the diameter of D1. Stigmatal line, especially dorsally, whitish edged, ventrally margined by the dark P-zone, between the transversal line/L1 and /stigmatal line more or less darkened, without pale elements. Subdorsal line drizzled to punctured (from cephal margin of S to D2), on F6 with transverse L-Elem.

As compared with *A. mansueta* most striking is the construction of the D2-base-spot which includes the subdorsal line in *A. staudingeri* and which is separated from this in *A. mansueta*.

The species was bred in Germany (female from Wadi Rayyan) with twigs of advanced blossoms of *Prunus cerasifera*.

***Conistra veronicae* (Hübner, [1813])**

Wadi Rayyan (2 on sugar baits); N Ajlun (1)

New for Jordan!

***Conistra acutula* (Staudinger, 1892)** (Fig. 6C)

Ajlun (1); Awsarah (6 on sugar baits +3 at light); Wadi Rayyan (11 on sugar baits +1 at light).

This is the sister-species of *Conistra pseudopolitina* Hacker, 1990. According to Fibiger et al. (2010), who examined the unique female holotype, *Conistra metria* Boursin, 1940 is synonymous with *C. veronicae* (Hübner, [1813]). So the species known as *C. metria* has to be called *Conistra pseudopolitina* Hacker, 1990. In male genitalia (Fig. 7H) and larvae *C. acutula* shows only minor differences to *C. pseudopolitina*.

Larvae (Fig. 6B): Appearance typical for *Conistra*-species (black Ns and As with bright white, broad subdorsal line). The larvae is very similar to its sister-species *Conistra* pseudopolitina Hacker, 1990 (compare Lehmann et al. 2009). Contrary to *C.* pseudopolitina *the orange (yellowish) Dorsal line is flecklike* enlarged in the caudad half of the anterior segments (up to S3), diameter 1/3-3/5, but from S4 continuously of the same width. The whitish-beige subdorsal line and epistigmatal line are less distinct in the last instar, width each 1/12-1/10, both fragmented to LI-Elem, epistigmatal line at SD1 in the midst between subdorsal line and SD1. Bp-base-fullspots plain white, diameter each 1/8.

We could rear the species from eggs (female from Wadi Rayyan) with twigs of advanced florescence of *Prunus cerasifera*.

***Lithophane lapidea* (Hübner, 1808)**

Awsarah (1)

New for Jordan!

A caterpillar was found on a *Juniperus* tree and tried to breed in Germany by feeding the ornamental *Juniperus scopulorum* "Skyrocket" but the larvae died in the fourth instar.

***Xylena exsoleta* (Linnaeus, 1758)**

Ajlun (1)

New for Jordan!

***Dryobota labecula* (Esper, [1788])**

Ajlun (ca.100 on sugar baits +35 at light); Ajlun-Hotel (6); Awsarah (6 on sugar baits +6 at light); Wadi Rayyan (4 on sugar baits +6 at light)

New for Jordan!

***Dryobotodes carbonis* (F.WAGNER, 1931)**

Ajlun (ca.200 on sugar baits +40 at light); Awsarah (5 on sugar baits +1 at light); Wadi Rayyan (4 on sugar baits +4 at light).

***Dryobotodes tenebrosa* (ESPER, 1789)**

Ajlun (2)
New for Jordan!

***Aporophyla nigra* (HAWORTH, 1809)**

Awsarah (1); Wadi Rayyan (1)
New for Jordan!

***Aporophyla australis* (BOISDUVAL, 1829)**

Dana Nature Reserve (1 pupa, imago emerged late October in Germany)

***Polymixis lea* (STAUDINGER, 1898)**

Gharandal I (1); Fayfa (10); Al Tafila (2).

***Polymixis rufocincta flavidior* (WARREN, 1911)**

Ajlun (12 on sugar baits +6 at light); Ajlun-Hotel (1); Awsarah (2).

***Polymixis trisignata* (MÉNÉTRIÉS, 1847)** (Fig. 6E)

Ajlun (5 on sugar baits+5 at light); Ajlun-Hotel (1); Awsarah (3); Wadi Rayyan (4 on sugar baits +7 at light); Wadi Mujib (1); Afra (3 on sugar baits +7 at light).

Reared from eggs (female from Wadi Rayyan), larvae (Fig. 6D) fed with twigs of advanced florescence of *Prunus cerasifera*.

***Polymixis apora* (STAUDINGER, 1898)**

Wadi Rayyan (2 larvae).

Larvae (Fig. 6F): Clearly belonging to subgenus *Bischoffia* HACKER & RONKAY, 1992. There are only small differences to *P. bischoffii* (HERRICH-SCHÄFFER, 1850)/ *P. culoti* (SCHAWERDA, 1921). In *P. culoti* (see BECK, B473a) the subdorsal line on Ns is enlarged to a white spot cephalad, and L1 (caudad of Stigma) is on the abdominal segments in a white corona, caudad bordered black; these features apply to *P. bischoffii* (and *P. cretica* RONKAY & VARGA, 1986) in the same way. In *P. apora* the subdorsal line on Ns is even throughout and inconspicuous, whitish; L1 (caudad of stigma) is in a black corona, which dorsal merges into a whitish stripe which leads to bristle SD1 (above the stigma).

We found two small larvae in crevices on *Marrubium* and breeding was carried out in Germany with hibernating leaf roses of *Geum urbanum*.

***Polymixis juditha* (STAUDINGER, 1898)**

Gharandal I (3); Fayfa (23); Al Tafila (3); Afra (1 on sugar baits).

Larvae (Fig. 6G): Easily recognizable as belonging to subgenus *Bischoffia* HACKER & RONKAY, 1992 by the black rectangular triangles in the dorsal zone. Contrary to the already known larvae of other species of this group (*P. bischoffii/culoti* and *P. apora*), the body of the larva of *P. juditha* is very unicoloured, in the dorsal region (above the position of the stigmatal line) unicoloured pale (reddish-)brownish-beige, only with some dark elements as margins of the dorsal line and dorsad rim of the subdorsal line and stigmatal line and therefore in heavy contrast to the plain black rectangular triangles, the ventrocephal sector of the dorsal zone, dorsocaudad margined by the straight line through D1 and D2 (both whitish base-spots little distinct), and cephalad bordered transversally, touching the base-spot of MD1; these triangles on SIII to S8, on SIII and S8 half as large. The dull whitish dorsal line very narrow, distinct intersegmentally cephalad of D1 and caudad of D2, 1/20 (intersegmentally) to 1/40 (caudad). Subdorsal line inconspicuous, marked only by some dark elements at the dorsal border. Stigmatal line with more or less visible whitish Elem, integrated in the pale whitish-beige ventral region.

Ns without distinct pattern, head with little distinct positive pattern (stripes and reticulation somewhat darker than the ground colour).

In general larval pattern match remarkably better to that of subgenus *Simplitype* Berio, 1980. The taxonomic position of *Polymixis juditha* (STAUDINGER, 1898) should be proved. For comparison a L5-instar larva of *P. rungsi* (PLANTE, 1975) from Morocco (Montes de Beni Snassen, Umg. Ain Almou 1209m, 13.10.2010 LF, N 34°49`46" W 02°11`09", leg. STADIE & DRECHSEL) is figgured (Fig. 6H).

We tried to rear the species in Germany (female from Fayfa) with twigs of advanced blossoms of *Prunus cerasifera* and *Lonicera tatarica*. Breeding was very difficult and the larvae had big problems pupating.

Fig 6: Larvae, reared and living moths

A: *Allophyes benedictina* (STAUDINGER, 1892) larvae, reared from egg, instar L5, Prov. Irbid, canyon of Wadi Rayyan
B: *Conistra acutula* (STAUDINGER, 1892) larvae, reared from egg, last instar L5, Prov. Irbid, canyon of Wadi Rayyan
C: *Conistra acutula* (STAUDINGER, 1892) reared ♂, Prov. Irbid, canyon of Wadi Rayyan
D: *Polymixis trisignata* (MÉNÉTRIÉS, 1847) larvae, reared from egg, last instar L5, Prov. Irbid, canyon of Wadi Rayyan
E: *Polymixis trisignata* (MÉNÉTRIÉS, 1847) reared ♀, Prov. Irbid, canyon of Wadi Rayyan
F: *Polymixis apora* (STAUDINGER, 1898) reared larvae, last instar L5, Prov. Irbid, canyon of Wadi Rayyan
G: *Polymixis juditha* (STAUDINGER, 1898) larvae, reared from egg, last instar L5, Prov. Tafila, SE Fayfa
H: *Polymixis rungsi* (PLANTE, 1975) larvae, reared from egg, last instar L5, Maroc Montes de Beni Snassen, Umg. Ain Almou

All leg., cult. & photos D. STADIE

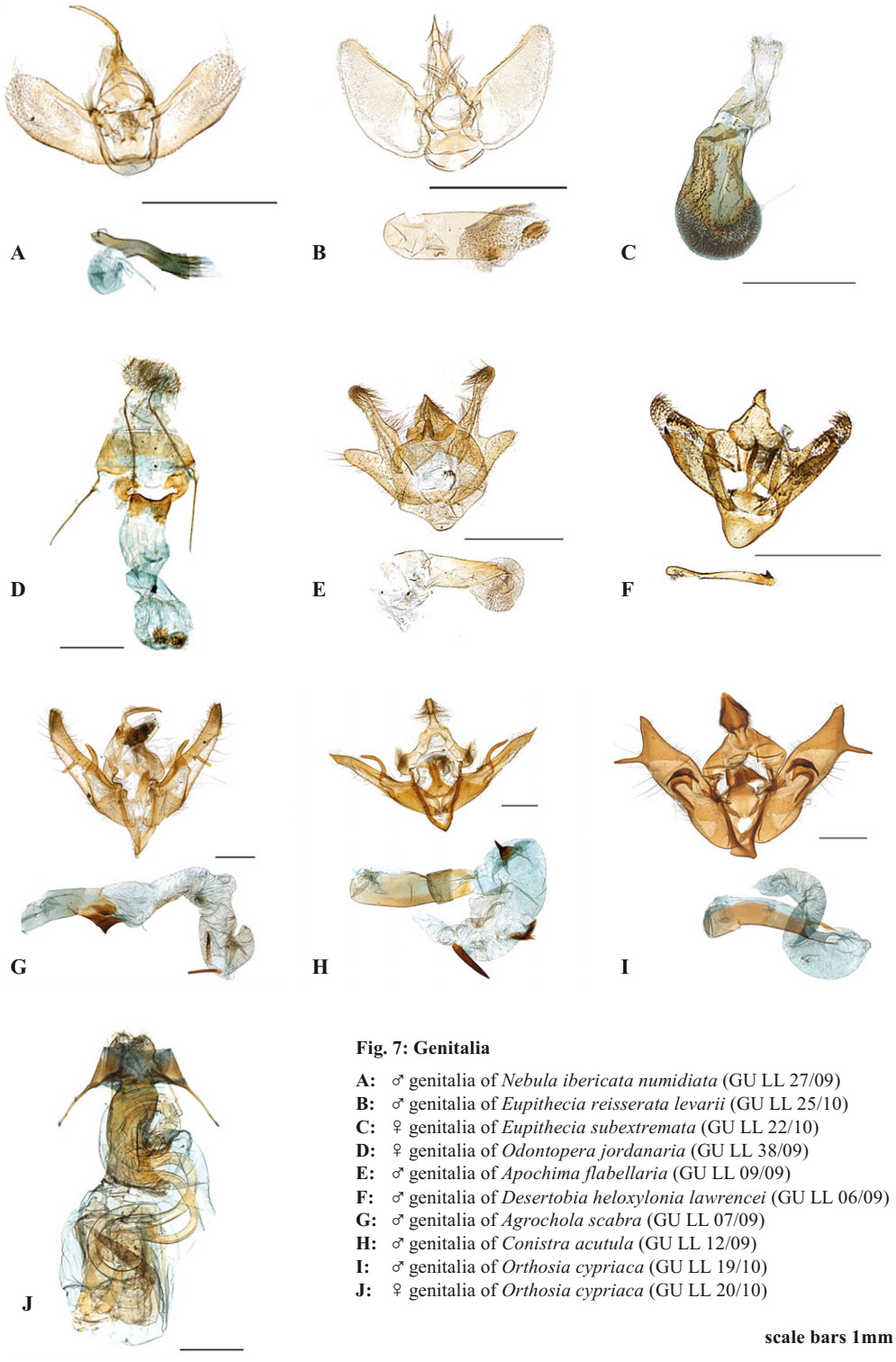


Fig. 7: Genitalia

A: ♂ genitalia of *Nebula ibericata numidiata* (GU LL 27/09)
B: ♂ genitalia of *Eupithecia reisserata levarii* (GU LL 25/10)
C: ♀ genitalia of *Eupithecia subextremata* (GU LL 22/10)
D: ♀ genitalia of *Odontopera jordanaria* (GU LL 38/09)
E: ♂ genitalia of *Apochima flabellaria* (GU LL 09/09)
F: ♂ genitalia of *Desertobia heloxylonia lawrencei* (GU LL 06/09)
G: ♂ genitalia of *Agrochola scabra* (GU LL 07/09)
H: ♂ genitalia of *Conistra acutula* (GU LL 12/09)
I: ♂ genitalia of *Orthosia cypriaca* (GU LL 19/10)
J: ♀ genitalia of *Orthosia cypriaca* (GU LL 20/10)

scale bars 1mm

***Polymixis ancepsoides* POOLE, 1989**
Awsarah (1); Wadi Rayyan (2 on sugar baits +6 at light)
New for Jordan!

***Orthosia cypriaca* HACKER, 1996**
N Ajlun (20).
The male and female genitalia (Fig. 7I, 7J) are figured.

***Orthosia cruda illustris* HREBLAY, 1993**
N Ajlun (10).

***Anarta trifolii* (HUFNAGEL, 1766)**
Fayfa 23. III. 2009 (3).

***Cardepia affinis* (ROTHSCHILD, 1913)**
Wadi Mujib (1).

***Hecatera fixseni* (CHRISTOPH, 1883)**
Fayfa 23. III. 2009 (6).
New for Jordan!

***Mythimna alopecuri* (BOISDUVAL, 1840)**
N Ajlun (1).

***Mythimna languida* (WALKER, 1858)**
Wadi Rayyan (2).

***Leucania palaestinae* STAUDINGER, 1897**
Fayfa 23. III. 2009 (8).

***Leucania loreyi* (DUPONCHEL, 1827)**
Ajlun (1); Awsarah (1); Wadi Rayyan (1); Wadi Mujib (1).

***Euxoa canariensis diamondi* BOURSIN, 1940**
Dana Nature Reserve (1).

***Agrotis segetum* ([DENIS & SCHIFFERMÜLLER], 1775)**
Wadi Mujib (1); Dana Nature Reserve (2).

***Agrotis trux* (HÜBNER, [1824])**
Ajlun (1); Awsarah (1).

***Agrotis puta* (HÜBNER, [1803])**
N Ajlun (10).

***Agrotis catalaunensis* (MILLIÉRE, 1873)**
Dana Nature Reserve (1).
According to FIBIGER et al. (2010), the species known as *A. syricola* CORTI & DRAUDT, 1933 has to be called *A. catalaunensis* and has a Holomediterranean distribution.

***Agrotis herzogi* REBEL, 1911**
Rahma (2); Fayfa 23. III. 2009 (1).

***Agrotis ipsilon* (HUFNAGEL, 1766)**
Ajlun (1); Awsarah (1); Wadi Rayyan (4); Wadi Mujib (1); Rahma (3); Wadi Rum I (1); Gharandal I (1); Fayfa (5); Al Tafila (1); Al Azraq (2); Dana Nature Reserve (4).

***Agrotis spinifera* (HÜBNER, [1808])**
Fayfa 23. III. 2009 (1).

***Eicomorpha antiqua ammonitica* HACKER, 2001**
Dana Nature Reserve (1 pupa, imago emerged mid April in Germany).
This species is distributed from East Turkey to Afghanistan and has its main distribution area in Central Asia. Surprisingly, seven males and two females from Shaubak (April and May 1968/1969) were found in the material, accumulated by KLAPPERICH in Jordan, which were described as ssp. *ammonitica* (HACKER & SCHREIER 2001). HACKER (2001) described this record as "… one of the most fascinating new records from the Levante". We can confirm the occurrence in Jordan. Steffen SCHELLHORN obtained one specimen in April from a pupa found mid March.

***Noctua pronuba* (LINNAEUS, 1758)**
Wadi Mujib (2).

Discussion

The Macrolepidoptera species of the winter/early spring fauna, collected during both trips, show once again that Jordan as part of the Levante is a meeting point of different faunal elements (Mediterranean, Irano-Turanian, Saharo-Arabian/Saharo-Sindhian, Palaeotropical, Afrotropical and Endemic). The endemic species and subspecies reported here are related either to Mediterranean, Irano-Turanian, Saharo-Arabian/Saharo-Sindhian or Afrotropical species. Some interesting examples should be mentioned here. *Perigune jordanaria* is an off-shoot of the North African populations of the West-Mediterranean *P. binaevata* (MABILLE, 1869). *Allophyes benedictina* belongs to the Mediterranean group of species of this genus as shown by us by the larval morphology. *Agrochola staudingeri* is the sister-species of the East Mediterranean *A. mansueta* (HERRICH-SCHÄFFER, 1850). *Agrochola pauli* and *Agrochola scabra* are members of the Ponto-Mediterranean *A. kindermanni*-group. But *A. scabra* is only distributed in the Irano-Turanian steppe zone of the Near East and more distantly related to the other three species of the group. A similar situation can be found in the subgenus *Bischoffia* HACKER & RONKAY, 1992 of *Polymixis* HÜBNER, 1820. The species are distributed in the eastern Mediterranean, like *P. apora* in the Mediterranean part of the Levante, except the species pair *P. juditha* (STAUDINGER, 1898)/*P. carolina* HACKER & LEGRAIN, 1999 which occurs in the eremic zone of the Levante and the SW Arabian Asir Mountain system, respectively.

Minucia wiskotti which we could rear from egg for the first time only occurs in oak habitats (like the two congeners) of the Irano-Turanian zone of Jordan and Israel. *M. lunaris* ([DENIS & SCHIFFERMÜLLER]], 1775) is a Holomediterranean species, while *Minucia bimaculata* OSTHELDER, 1933 to which *M. wiskotti* is probably more related is Irano-Turanian. Although *Conistra acutula* is spread in the northern Mediterranean part of the Near East (from southern Turkey to Jordan) it belongs to a species-group within *Conistra* HÜBNER, 1821 of Irano-Turanian origin. Examples of endemic Levante subspecies of Irano-Turanian species are *Trichiura stroehlei carmelea* and *Eicomorpha antiqua ammonitica*.

Polymixis lea is the easternmost member of the subgenus *Eumichtis* HÜBNER, 1821 of *Polymixis* of which two species are Mediterranean elements, *P. lichenea* (HÜBNER, 1821) and *P. variabile* (STERTZ, 1915) while the others are of Saharo-Arabian origin, distributed through North Africa with *P. lea* as the endemic Near East representative. *Grammodes boisdeffrii palaestinensis* is the Syro-Eremic subspecies of an Afro-Eremic species distributed in the northern Sahara from Mauretania to Egypt.

The most astonishing result of the trip was the discovery of *Desertobia heloxylonia lawrencei* **ssp. n.**

The species was described just recently from deserts of Northwest China. The specimens from Afghanistan found by us in the Staatliches Museum für Naturkunde Karlsruhe together with our record show the species to be of Saharo-Sindhian distribution bound to plant communities with *Haloxylon*. The lack of more records within the huge distribution area, despite of suitable habitats, is probably due to the unusual flight-time in winter in cold nights.

Examples of Levant endemics recorded during our trips with Afrotropical relations are e.g. *Stoermeria nabataea* and *Euproctis fasciata susanna*. *Odontopera jordanaria* (STAUDINGER, 1898) **comb. n.** is not as closely related to species of the genus *Crocallis* TREITSCHKE, 1825 in which it was listed up to now as thought. Morphological characteristics assume a relationship to Afrotropical members of *Odontopera* STEPHENS, 1831.

As shown by the extensive exploration of the lepidopterous fauna of Israel, also the fauna of Jordan will reveal more interesting results and surprises when investigated more thoroughly, especially in winter.

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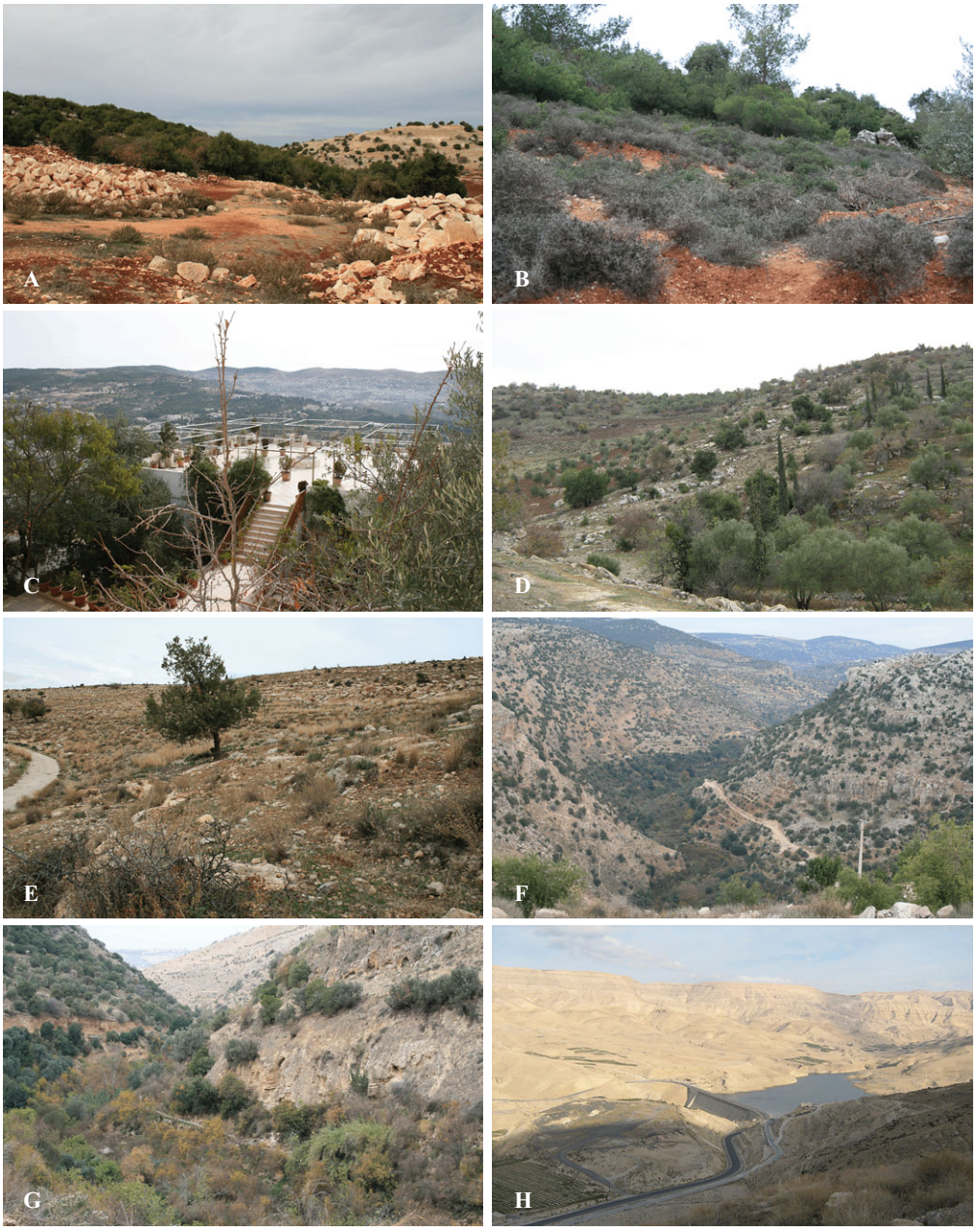

Fig. 8: Biotopes

A: Provinz Irbid, Ajlun Forest Reserve, 950m, 20. XII. 2008
B: Provinz Irbid, Ajlun Forest Reserve, 950m, 20. XII. 2008
C: Prov. Irbid, western outskirts of Ajlun, Ajlun-Hotel, 900m, 20.-21. XII. 2008
D: Prov. Irbid, near road Ba'un-Awsarah, 1km N Awsarah, 500-600m, 21. XII. 2008
E: Prov. Irbid, near road Ba'un-Awsarah, 1km N Awsarah, 500-600m, 21. XII. 2008
F: Prov. Irbid, canyon of Wadi Rayyan, next to Ba'un (Judayta), 600-650m, 22. XII. 2008
G Prov. Irbid, canyon of Wadi Rayyan, next to Ba'un (Judayta), 600-650m, 22. XII. 2008
H: Prov. Karak, above Wadi Mujib, above Mujib Dam, 350m, 23. XII. 2008 and 30. XII. 2008

all photos: Dirk Stadie and Lutz Lehmann

Fig. 9: Biotopes

A: Prov. Karak, above Wadi Mujib, above Mujib Dam, 350m, 23. XII. 2008 and 30. XII. 2008
B: Prov. Ma'an, Arava Valley, ca. 37km N Aqaba, S Rahma, 50-100m, 24.-25. XII. 2008
C: Prov. Ma'an, Arava Valley, ca. 37km N Aqaba, S Rahma, 50-100m, 24.-25. XII. 2008
D: Prov. Ma'an, Wadi Rum area, E Aqaba, near Tourist Information Centre, 830m, 26. XII. 2008
E: Prov. Tafila, SE Fayfa, towards Al Tafila, Wadi, 50m, 28. XII. 2008
F: Prov. Tafila, road Al Tafila-Fayfa, 16,5km W Al Tafila, 300m, 28. XII. 2008
G: Prov. Tafila, NE Al Tafila, 2km SE Afra, 650-700m, 29. XII. 2008
H: Prov. Tafila, NE Al Tafila, 2km SE Afra, 650-700m, 29. XII. 2008

all photos: Dirk STADIE and Lutz LEHMANN

Legends of biotope figures

Fig. 8

A: Provinz Irbid, Ajlun Forest Reserve, 950m, 20. XII. 2008, Mediterranean Kermes Oak (*Quercus calliprinos* WEBB.) - woodland mixed with *Pinus halepensis* MILLER, *Crataegus aronia* (L.) DC and overgrazed low vegetation composed of dwarf shrub communities e.g. *Thymus*-, *Phlomis*- and *Cistus*-spec.

B: Provinz Irbid, Ajlun Forest Reserve, 950m, 20. XII. 2008, (same).

C: Prov. Irbid, western outskirts of Ajlun, Ajlun-Hotel, 900m, 20.-21. XII. 2008, edge of *Quercus calliprinos* WEBB. - forest with some *Pistacia atlantica* DESF., ruderal and synanthropic vegetation.

D: Prov. Irbid, near road Ba'un-Awsarah, 1km N Awsarah, 500-600m, 21. XII. 2008, Tabor Oak (*Quercus ithaburensis*) - park forest with some *Crataegus aronia* (L.) DC - bushes mixed with extensive sweet almond (*Amygdalus communis* L.) - orchards and herb-rich Mediterranean steppe vegetation, e.g. with *Stipa*-, *Ononis*-, *Lotus*-, *Phlomis*-, *Majorana* and *Gypsophila*-spec.

E: Prov. Irbid, near road Ba'un-Awsarah, 1km N Awsarah, 500-600m, 21. XII. 2008, Prov. Irbid, near road Ba'un-Awsarah, 1km N Awsarah, 500-600m, 21. XII. 2008, Tabor Oak (*Quercus ithaburensis*) - park forest with some *Crataegus aronia* (L.) DC - bushes mixed with extensive sweet almond (*Amygdalus communis* L.) - orchards and herb-rich mediterranean steppe vegetation, e.g. with *Stipa-, Ononis-, Lotus-, Phlomis-, Majorana and Gypsophila*-spec.

F: Prov. Irbid, canyon of Wadi Rayyan, next to Ba'un (Judayta), 600-650m, 22. XII. 2008, deep gorge with permanent water flow, very old Olive (*Olea europaea* L.) trees, extensive Pomegranate (*Punica granatum* L.) - orchards; rich riverine vegetation, e.g. *Clematis cirrhosa* L., *Populus-, Rubus- and Rubia*-spec.; bushy steppe vegetation, e.g. *Quercus calliprinos* WEBB., *Crataegus aroina* (L.) DC, *Marrubium-, Gypsophila-, Thymus*-spec.

G: Prov. Irbid, canyon of Wadi Rayyan, next to Ba'un (Judayta), 600-650m, 22. XII. 2008, deep gorge with permanent water flow, very old Olive (*Olea europaea* L.) trees, extensive Pomegranate (*Punica granatum* L.) - orchards; rich riverine vegetation, e.g. *Clematis cirrhosa* L., *Populus*-, *Rubus*- and *Rubia*-spec.; bushy steppe vegetation, e.g. *Quercus calliprinos* WEBB., *Crataegus aroina* (L.) DC, *Marrubium*-, *Gypsophila*-, *Thymus*-spec.

H: Prov. Karak, above Wadi Mujib, above Mujib Dam, 350m, 23. XII. 2008 and 30. XII. 2008, overgrazed small irano-turanian steppe fragment (afforestation with *Pinus halepensis* MILLER) with scattered *Artemisia herba-alba* ASSO and ruderal vegetation.

Fig. 9

A: Prov. Karak, above Wadi Mujib, above Mujib Dam, 350m, 23. XII. 2008 and 30. XII. 2008, overgrazed small irano-turanian steppe fragment (afforestation with *Pinus halepensis* MILLER) with scattered *Artemisia herba-alba* ASSO and ruderal vegetation.

B: Prov. Ma'an, Arava Valley, ca. 37km N Aqaba, S Rahma, 50-100m, 24.-25. XII. 2008, patch-like rich desert vegetation on different kinds of soil with nubo-sindian influence, scattered *Acacia tortilis* (FORSSK.) HAYNE -stands on gravel, sand dunes with *Calligonum*-spec., single date palms (*Phoenix dactylifera* L.) and small saline flats (Inland Sabkha-vegetation) on muddy ground.

C: Prov. Ma'an, Arava Valley, ca. 37km N Aqaba, S Rahma, 50-100m, 24.-25. XII. 2008. (same)

D: Prov. Ma'an, Wadi Rum area, E Aqaba, near Tourist Information Centre, 830m, 26. XII. 2008, desert on stony ground with patches of sand dunes, *Haloyxlon persicum-Artemisia monosperma-Calligonum comosum Stipagrostis darii*-plant society (Red Sand Community).

E: Prov. Tafila, SE Fayfa, towards Al Tafila, Wadi, 50m, 28. XII. 2008, eremic wadi vegetation with *Tamarix*-bushes, *Arundo donax* L. and scattered trees of *Populus euphratica* OLIVER in contact with semi-desert vegetation (*Launea*- spec., *Fagonia arabica* L. and others) on calcarous soil.

F: Prov. Tafila, road Al Tafila-Fayfa, 16,5km W Al Tafila, 300m, 28. XII. 2008, rocky slope on calcarous ground in the contact-zone between semi-desert and irano-turanic steppe-zone with *Retama raetam* (FORSSK.) WEBB & BERTHEL. and *Artemisia herba-alba* ASSO with low anthropogenic influence.

G: Prov. Tafila, NE Al Tafila, 2km SE Afra, 650-700m, 29. XII. 2008, rocky slope covered mainly with *Artemisia herba-alba* ASSO , partly orchards with *Amygdalus communis* trees and ruderal vegetation.

H: Prov. Tafila, NE Al Tafila, 2km SE Afra, 650-700m, 29. XII. 2008. (same)

Zusammenfassung

Die Ergebnisse von zwei lepidopterologischen Sammelreisen nach Jordanien vom 20.12. bis 30.12. 2008 (Provinzen: Irbid, Karak, Tafila und Ma'an) und 19.03. bis 25.03. 2009 (Provinzen: Zarqa, Tafila, Irbid und Balqa) werden präsentiert. Dabei konnten 166 Großschmetterlingsarten festgestellt werden, darunter 21 Arten neu für Jordanien. *Desertobia heloxylonia lawrencei* **ssp. n.** wird beschrieben. Das weibliche Genital von *Odontopera jordanaria* (STAUDINGER, 1898) **comb. n.**, wird erstmals abgebildet. Die Raupen von *Odontopera jordanaria* STAUDINGER, 1898, *Minucia wiskotti* (PÜNGELER, 1902), *Allophyes benedictina* (STAUDINGER, 1892), *Agrochola scabra* (STAUDINGER, 1892), *Agrochola staudingeri* RONKAY, 1984, *Conistra acutula* (STAUDINGER, 1892), *Polymixis apora* (STAUDINGER, 1898) und *Polymixis juditha* (STAUDINGER, 1898) werden beschrieben und abgebildet.

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