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The Lepidoptera of Israel

Faunistic data on Geometridae : I. Orthostixinae and Geometrinae

Axel Hausmann

Zoologische Staatssammlung, Münchhausenstraße 21, D-81247 München, Germany

Summary

Faunistic data on 20 species of Orthostixinae and Geometrinae (family Geometridae) occurring in Israel are presented. About 2.800 examined specimens have been taken into account. Data from all available literature citations are included. Distribution pattern, ecology and phenology of each species are discussed. Threatened species are compiled in a "Red List" for the first time.

Zusammenfassung

Faunistische Daten von 20 in Israel vorkommenden Arten der Unterfamilien Orthostixinae und Geometrinae (Geometridae) werden vorgelegt. Das untersuchte Material umfaßt ca. 2.800 Exemplare. Unter zusätzlicher Berücksichtigung aller verfügbarer Literaturangaben werden Verbreitungsmuster, Ökologie und Phänologie einer jeden Art eingehend diskutiert. Die in ihren Beständen gefährdeten Arten werden erstmals in einer „Roten Liste Israels" zusammengestellt.

Résumé

Des données faunistiques sur 20 espèces d'Orthostixinae et de Geometrinae (famille Geometridae) existant en Israel sont présentées. Le matériel examiné comporte environ 2.800 exemplaires. La répartition, l'écologie et la phénologie de chaque espèce est discutée, en tenant compte des données complètes existant dans la littérature. Pour la première fois, les espèces menacées sont énumérées dans une «Liste rouge».

Introduction

This paper is the first part of the third of three series of publications :

1) Systematic list of species occurring in the Levantine basin and its

neighbouring countries ; first part already published (Hausmann, 1996b).
2) Morphology of species occurring in the Levantine basin and its neighbouring countries ; first part already published (Hausmann, 1996a).
3) Faunistic data on the species occurring in the state of Israel within the political borders of 1990.

Therefore the present paper can omit detailed nomenclatorial or morphological information and concentrate on faunistics and ecology.

The fauna of Israel includes twenty species belonging to the subfamilies Orthostixinae and Geometrinae. This includes two pairs of sister species (*Victoria plantei / eremita* ; *Microloxia herbaria / ruficornis*), which are closely related to each other respectively. At present they have to be considered vicariant allopatric species pairs. Further studies are necessary to discover whether some gene-flow (rarely occurring interbreeding) is taking place or whether separation is complete.

The present publication is based on the (database-)recorded data on about 25.000 specimens of Geometridae from Israel, 2837 specimens belonging to the subfamilies Orthostixinae and Geometrinae, all of these examined and identified by the author. The major part of this material (17 species, about 2700 specimens) was collected in the course of the project "The Lepidoptera of Israel : a study of the taxonomy and distribution of the entire fauna with the aim of determining conservation needs" by the Zoologische Staatssammlung, Munich, the Nature Reserve Authority, Jerusalem and the Tel Aviv University.

The resulting data are grouped for each species into the following sections :

Scientific name and references. References are mentioned when containing information about the distribution of the species in Israel.

Material examined. The total number of specimens examined by the author is mentioned, based mainly on material caught in the course of the project "The Lepidoptera of Israel", but also including material stored in various collections. Localities in which the species was found are grouped according to the 31 zoogeographical zones of the study area. They will be discussed extensively in a separate publication.

Abbreviations used in this paper :

LI — Specimens from the project "The Lepidoptera of Israel..." (number specified) ; CI — Specimens stored in the entomological collections in Israel (number specified) (cf. Hausmann, 1997) ; ZSM — Specimens

stored in the Zoologische Staatssammlung München (number specified) ; ZMK — Specimens stored in the Zoologisk Museum København (number specified) ; NHMW — Specimens stored in the Naturhistorisches Museum Wien (number specified) ; Am — recorded by Amsel (1935) (number specified) ; Ha — recorded by Hausmann (1991) (number specified) ; St — recorded by Staudinger (1892 ; 1897/8) (abundance specified) ; Ka — recorded by Kalchberg (1897) (abundance specified) ; H&S — recorded by Halperin & Sauter (1992) ; r — rare ; c — common.

Distribution pattern. Zoogeographical patterns are described considering the whole area of distribution of the species or subspecies respectively. Zoogeographical categories ("chorotypes") after Parenzan (1994), who bases his system on the studies of La Greca (1963) and Vigna Taglianti *et al.* (1992). This system needs to be slightly modified in the southeastern part of the W. Palaearctic Region (abbreviations and modifications see below). The local distribution patterns revealed by the examination of the material from within the study area are discussed.

Abbreviations of zoogeographical categories used in this paper (cf. Parenzan, 1994) :

1) Species widely distributed in the Holarctics : TUM — Turanian-Mediterranean ; 2) Species with European distribution : EUR — European (or Central-South-European) ; 3) Species with Mediterranean distribution : MED — (Holo-)Mediterranean, MEE — E. Mediterranean ; 4) Afrotropical and Oriental species partly ranging into the W. Palaearctics : AIM — Afrotropical-Indian-Mediterranean, AFM — Afrotropical-Mediterranean, AWA — Afrotropical-W.Arabian (Rift Valley distribution), *newly introduced category*, 5) Species widely distributed in marginal areas of the W. Palaearctics : SAS — Saharo-Sindian, SAA — Saharo-Arabian (SA in Wiltshire, 1990), *newly introduced category*, SAH — Saharian, ARA — Arabian, ARS — Arabian-Sindian (Eastern Eremic, EE in Wiltshire, 1990), *newly introduced category*.

Supplementary range in marginal areas of one of the categories given above : 2 — Anatolian ; 4 — Iranian ; 13 — Illyric ; 14 — Levantine ; 15 — Libyan.

Ecology. Habitat preference (ecotype, vertical distribution) is described for adult stages according to data collected during the project "The Lepidoptera of Israel" (rarely using bibliographic citations). Larval foodplant spectrum is characterized ; the latter data often obtained from literature citations, preferably from authentic field observations rather than data resulting from rearing experiments. Life-history strategy of species is determined or estimated by considering all the available data, e.g. the phenological patterns (cf. Hausmann, 1990 :

Plate 1. Geometrid moth habitats in Israel.
Above : Nahal Ammud, N. Israel. View over the valley from the trapping site, habitat of *M. shohami*, *P. coronillaria*, *H. pruinosata*, *A. ononaria*, *P. pulmentaria*, *P. faustinata*.
Below : Hula Reserve, N. Israel, surroundings of the light trap operated in the project "Lepidoptera of Israel" (in the background the Golan Heights) ; habitat of *M. shohami*, *H. pruinosata*, *A. ononaria*, *P. neriaria*, *X. olympiaria*, *E. indigenata*, *P. pulmentaria*, *P. faustinata*, *M. herbaria*.

Plate 2. Geometrid moth habitats in Israel.
Above : Jerusalem, En Kerem, C. Israel, typical habitat in the surroundings. There are many literature citations from this locality : habitat of *M. shohami*, *H. pruinosata*, *M. pulchra*, *X. olympiaria*, *E. indigenata*, *C. prouti*, *P. pulmentaria*, *M. herbaria*, *H. semitaria*.
Below : Enot Zuqim, Dead Sea area, C. Israel, swamp vegetation surrounding the light trap operated in the project "Lepidoptera of Israel", habitat of *M. shohami*, *P. faustinata*, *N. pulvereisparsa*, *M. ruficornis*, *A. micra*, *H. sabulifera*.

104) : the r-K-continuum is abstracted into three groups : r-strategy, intermediate strategy, K-strategy (cf. e.g. Rejmanek & Spitzer, 1982).

Abbreviations used in this section :

m — meters above Sea Level ; FP1 — Flora Palaestina, Part 1 : Zohary (1966) ; FP2 — Flora Palaestina, Part 2 : Zohary & Feinbrun-Dothan (1972) ; FP3 — Flora Palaestina, Part 3 : Zohary & Feinbrun-Dothan (1978) ; FP4 — Flora Palaestina, Part 4 : Feinbrun-Dothan (1986).

Phenology. Flight periods of adult stages are characterized, as far as possible, from various localities (when sample size is sufficient). The phenology is compared with literature citations from neighbouring countries. Flight seasons are shown on diagrams for species with enough available data. However, the patterns on these diagrams can often be distorted by an uneven seasonal distribution of collecting efforts at a locality. An interpretation is given in the text part. Information about ♀-rate and possible protandrous emergence is sometimes based on small sample sizes and therefore has to be considered as preliminary.

Abbreviations used in this section :

B — beginning, M — mid, E — end of the month (numbers 1-12) respectively.

Red List category. Degree of threat to the species and degree of habitat isolation are estimated. The system of "Red List Categories" are defined as in IUCN Red List of Threatened Animals (1988). The categories I (indeterminate) and K (insufficiently known) are not used in this paper. The term T (threatened) is used according to the IUCN Red List as E + V + R. The classification into categories is made as a preliminary proposal ; the quantity of faunistic data is still insufficient to allow for a definitive judgement.

Abbreviations of categories :

Ex — extinct ; E — endangered ; V — vulnerable ; R — rare.

Maps. Examined records (spots of different size) and unexamined literature citations (asterisks) are presented on small maps ; in addition a hypothetical distribution area within Israel is generalized from the available data. It should be taken into account that collecting efforts are not the same for all parts of the country. Therefore a lack of spots does not necessarily means that a species is absent from the area.

Meaning of symbols :

* — literature reference ; • — 1-5 specimens ; ◉ — 6-20 specimens ; ● > 20 specimens.

Systematic Part

Orthostixinae

Myinodes shohami Hausmann, 1994

Pseudotagma Stgr. *interpunctaria* HS. : Staudinger, 1892 : 168.
Pseudotagma (*Eusarca*) *interpunctaria* HS. : Kalchberg, 1897 : 182.
Eusarca interpunctaria H.-S. : Amsel, 1933 : 109.

Material examined. 33 specimens : **1b** : Hula Reserve (LI : 11) ; Sede Nehamya (CI : 4) ; Neot Mordekhai (CI : 1). — **2** : Nahal Ammud (LI : 9) ; Gazit (CI : 1). — **3** : Haifa (NHMW : 1 ; Ka : c). — **9a** : Tel Aviv (NHMW : 1). — **11** : Jerusalem (St : 1 ♂. — **13b** : En Gedi (LI : 4) ; Enot Zuqim (LI : 1).

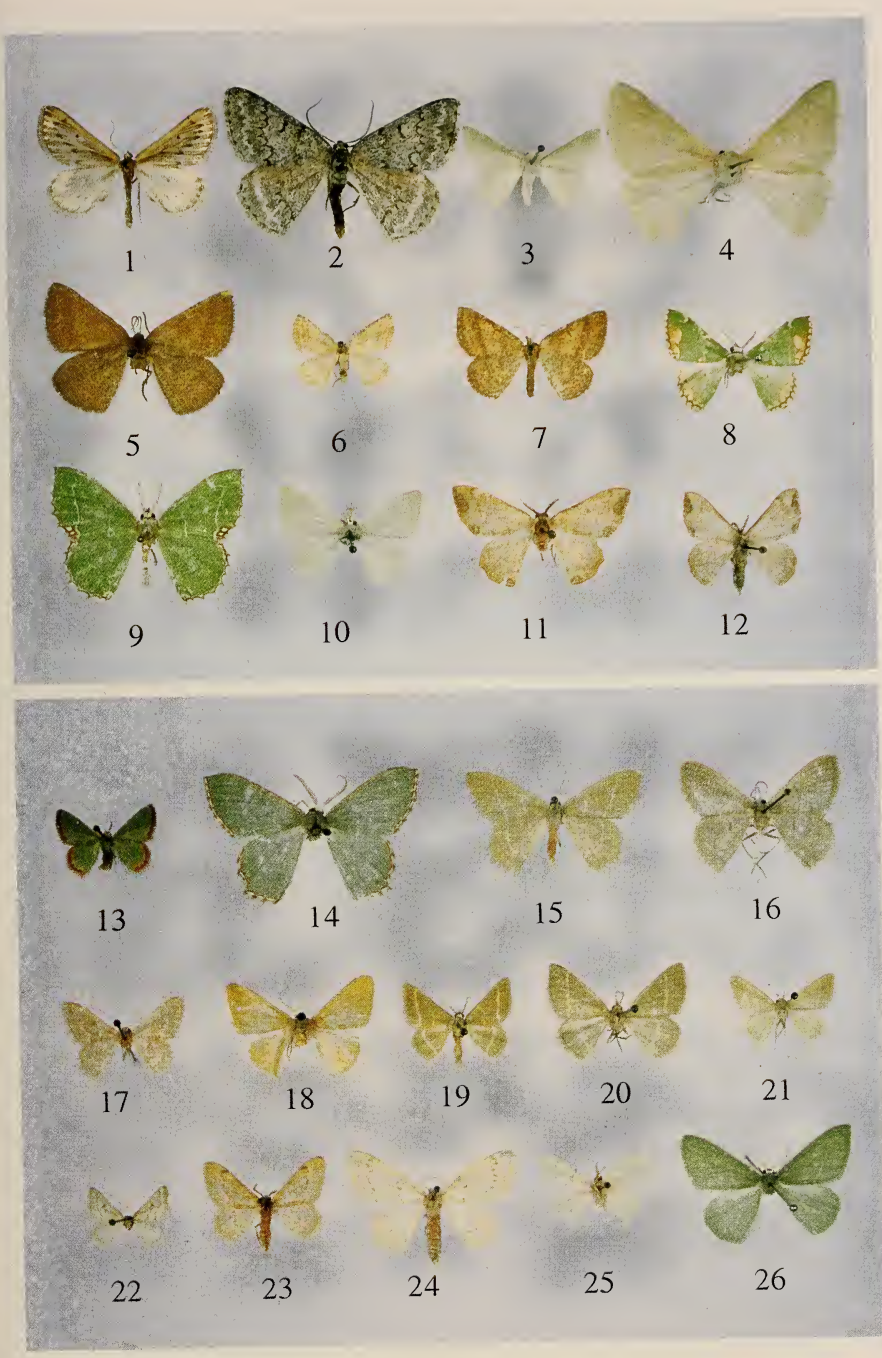
Distribution pattern (Map 1) : MEE, 2, 4, 15. In Israel probably widely distributed all over the northern and central parts. Populations nevertheless small, presumably quite isolated from each other.

Ecology. From – 400 up to 300 m (in S. Turkey, Jordan and N. Iraq up to 900 m). Probably K-strategy, females according to external appearance and ♀-rate at light seem to be inactive flyers. Larval foodplant unknown. Caterpillars of the closely related *Myinodes interpunctaria* (Herrich-Schäffer, 1839) in Italy perhaps feed on *Rhamnus cathartica* (cf. Parenzan, 1994 : 109 ; Spada, 1893).

→

Plate 3. Geometridae of the Levant, natural size (figs. 1-12).
1 — *Myinodes shohami* Hausm., ♂ ; 2 — *Pseudoterpna coronillaria halperini* Hausm., ♂ (holotype) ; 3 — *Holoterpna pruinosata* Stgr., ♂ (lectotype) ; 4 — *Holoterpna pruinosata* Stgr., ♀ ; 5 — *Aplasta ononaria* Fuessly, f. *berytaria* Stgr., ♀ (1st brood) ; 6 — *Aplasta ononaria* Fuessly, f. *faecataria* Hbn., ♀ (2nd brood) ; 7 — *Aplasta ononaria* Fuessly, f. near *berytaria* Stgr., ♀ (1st brood) ; 8 — *Microbaena pulchra* Stgr., ♂ (holotype) ; 9 — *Proteuchloris neriaria* H.-S., ♂ ; 10 — *Xenochlorodes olympiaria cremonaria* Stgr., ♂ ; 11 — *Victoria plantei* Herbulot, ♂ ; 12 — *Victoria eremita* Hausm., ♂ (paratype).

Plate 4. Geometridae of the Levant, natural size (figs. 13-26).
13 — *Eucrostes indigenata* Vill., ♂ ; 14 — *Culpinia prouti* Th.-Mieg, ♂ ; 15 — *Phaiogramma pulmentaria* Gn., ♂ ; 16 — *Phaiogramma faustinata* Mill., ♂ ; 17 — *Neromia pulvereisparsa jodisata* Stgr., ♂ ; 18 — *Kuchleria gisisi* Hausm., ♂ (holotype) ; 19 — *Microloxia herbaria* Hbn., ♂ ; 20 — *Microloxia herbaria* Hbn., ♀ ; 21 — *Microloxia ruficornis* Warr., ♂ ; 22 — *Acidaliastis micra* Hmps., ♂ ; 23 — *Hemidromodes sabulifera hessa* Prt., ♂ ; 24 — *Hemidromodes sabulifera hessa* Prt., ♀ ; 25 — *Hemidromodes sabulifera hessa* Prt., green form, ♂ ; 26 — *Hierochthonia semitaria* Pglr., ♂ (holotype).



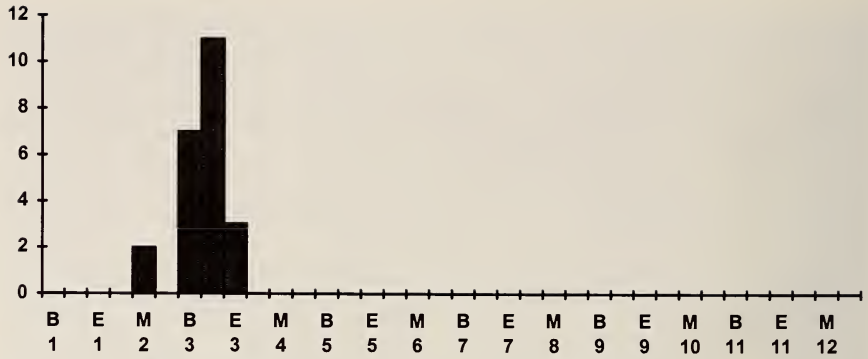


Fig. 27. *Myinodes shohami* : phenology in N. Israel ; n = 23.

Phenology (Fig. 27). Univoltine M2-E3, one specimen in "January". Larval development probably in April-May (no authentic data available). ♀-ratio at light rather low (9%). Not protandrous.

Red List category. Not threatened.

Remarks. For some closely related Mediterranean species see Hausmann (1994).

Geometrinae

Pseudoterpnini Warren, 1893

***Pseudoterpna coronillaria halperini* Hausmann, 1996**

Pseudoterpna coronillaria Hb. : Kalchberg, 1897 : 179.
Pseudoterpna coronillaria Hb. : Amsel, 1933 : 107.

Material examined. 44 specimens : **1a** : Mt. Meron (CI : 1) ; Shetula (LI : 2). — **1b** : Sede Nehamya (CI : 12) ; Banyas (LI : 4). — **2** : Nahal Ammud (LI : 10). — **3** : Haifa (CI : 2 ; ZMK : 1 ; Ka). — **4a** : Nahal Bezet (LI : 1) ; Nahal Keziv (LI : 6). — **7a** : N. Lake Kinneret (LI : 1). — **11** : Jerusalem (LI : 1). — **18** : (Qibbuz) Senir (LI : 3).

Distribution pattern (Map 2). MED, distribution of species disjunct ; subspecies endemic, constituting a "MEE-complex" with the closely related ssp. *axillaria* Guenée, 1857 from Lebanon. This complex is geographically quite isolated from the other populations of *Pseudoterpna coronillaria*. In Israel restricted to the Mediterranean Zone in the North and some higher and rather isolated localities in the Judean Mountains (C. Israel). Typical *P. c. halperini* in the Mt. Hermon area. Genital morphology of northwestern populations slightly different (Hausmann, 1996a).

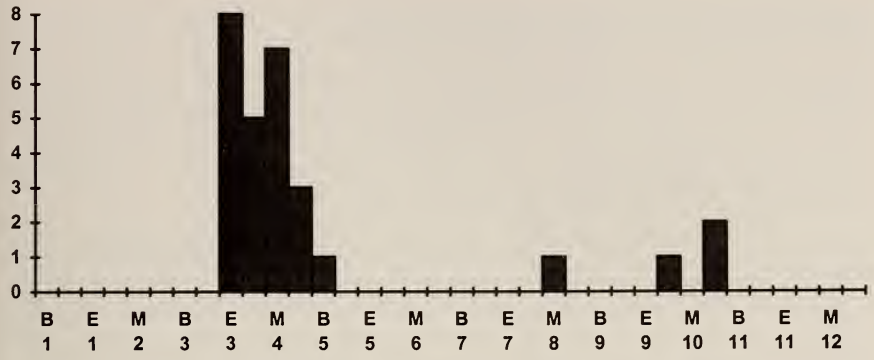


Fig. 28. *Pseudoterpna coronillaria halperini* : phenology in N. Israel ; n = 28.

Ecology. From – 200 up to 1000 m with preference for ca. 200-500 m. Species of the shrubland Mediterranean. In Israel presumably K-strategy. Larval foodplants in Israel probably *Gonocytisus pterocladus* in Upper Galilee (FP2 : 47) and *Genista fasselata* on Mt. Carmel and its adjacent coastal hills (FP2 : 46). *P. c. coronillaria* (in S. Europe) feeds on *Ulex*, *Genista* and *Cytisus* (Culot, 1919 : 8 ; Rebel, 1903 : 2).

Phenology (Fig. 28). E3-E4 ; M8-E10 ; exceptionally B5 (Haifa, one specimen), M6 (Jerusalem, one specimen). Second generation not fully developed, only single specimens, which emerge as small "hunger-forms". In Cyprus from April to May (Wiltshire, 1948 : 82). One male recorded from Jordan (Hausmann, 1991 : 115) in M6. In the Lebanon (*P. c. axillaria*) however regularly "from June to December" (Ellison & Wiltshire, 1939 : 43)! ♀-ratio at light low (12%). Not protandrous.

Red List category. Not threatened.

Remarks. Specimens from Jerusalem and Nahal Ammud genitalically (♂♀) corresponding well to the type series of *P. c. halperini*. Two specimens from E10 (Nahal Ammud) with forewing length of 12 mm only ; length of antennal branches (♂) 0.35 mm only (twice width of flagellum at same point).

"*Pseudoterpna pruinata* Hufn.", erroneously mentioned by Bodenheimer (1937 : 86) as occurring in Israel, has not been recorded from there and has to be deleted from the list.

Holoterpna pruinosata (Staudinger, 1898)

Eucrostis (?) *pruinosata* Stgr. : Staudinger, 1898 : 303.
Holoterpna pruinosata Stgr. : Amsel, 1933 : 107.

Holoterpna pruinosata Stgr. : Amsel, 1935 : 240.
Holoterpna pruinosata Stgr. : de Bros, 1993 : 95.

Material examined. 30 specimens : **1a** : Mapal Ha Tanur (IC : 1). — **1b** : Hula Reserve (LI : 2) ; Sede Nehamya (IC : 10). — **2** : Nahal Ammud (LI : 10) ; Gazith (IC : 1). — **5** : Megiddo (IC : 1). — **6a** : Daliyya (IC : 1). — **9a** : Ashqelon (de Bros 1993 : 1 ♀). — **11** : Jerusalem (IC : 2 ; St : c ; MNHU : 2 — types) ; Qiryat Anavim (Am : 1) ; En Kerem (Am : 1).

Distribution pattern (Map 3). Typical Levantine species (MEE, 13*, occurrence in NE. Italy anthropogenous, probably introduced by ship). Within Israel restricted to the mediterranean influenced North and the eastern part of C. Israel. Absent from the South, the Dead Sea area and the Lower Jordan Valley. Outside Israel known from the Lebanon.

Ecology. From 0 up to 700 m. Species of open grassland. Intermediate strategy? Oviposition on *Ferulago galbanifera* (Umbelliferae) in NE. Italy (Rebel, 1924 : 6), larva "feeding on its flowers". According to Staudinger (1898 : 303 ; data from Israel) caterpillars "lived on *Foeniculum* sp." (Umbelliferae). In Israel, *Foeniculum vulgare* is common all over the Northern and Central parts including the Dead Sea area (FP2 : 440) ; *Ferulago syriaca* is uncommon in Upper Galilee, Mt. Carmel and the Judean Mts. (FP2 : 432).

Phenology. B4-B6 ; B8-B11. In August only single specimens. In Israel apparently bivoltine! First generation in the mountains somewhat later (E4-B6) than at lower level ; second generation earlier. Lebanese records from July and September (Ellison & Wiltshire, 1939 : 43). Larva in July, pupa overwinters, sometimes twice (NE. Italy ; Rebel, 1924 : 6). ♀-ratio at light 50%. Not protandrous.

Red List category. R. In the last thirty years recorded from only three localities.

Aplasta ononaria (Fuessly, 1783)

Aplasta ononaria Fuesl. var. *faecataria* Hb. : Kalchberg, 1897 : 182.
Aplasta ononaria Fuesl. : Amsel, 1933 : 107.

Material examined. 51 specimens : **1a** : Nahal Iyon (LI : 12). — **1b** : Banyas (LI : 2) ; Tel Dan (LI : 1) ; Hula Reserve (LI : 17) ; Sede Nehamya (IC : 13) ; Lahavot Ha-Bashan (IC : 1). — **2** : Nahal Ammud (LI : 1). — **3** : Haifa (Ka : not rare). — **7a** : Jordan Park (LI : 1) ; Buteiha (LI : 2). — **19** : Hermon (IC : 1).

Distribution pattern (Map 4). EUR, 2, 4, 14. In Israel restricted exclusively to the Mediterranean Zone of the North. Possibly there are two taxonomic entities : "f. *faecataria*" until now being the only form

in the Mt. Hermon area, while e.g. in Nahal Iyon only "f. *berytaria*" has been recorded. Both forms fly sympatrically in the Hula Valley. The solution of this problem must await more extensive material and rearing data becoming available. Compare taxonomical and morphological notes in Hausmann (1996a).

Ecology. From – 200 up to ca. 1000 m. Species of Mediterranean scrubland, hygrophilous according to Dannehl (1927 : 403 : "reproduction in wet localities", N. Italy). According to Koçak & Seven (1993 : 119) associated with "Artemisietea fragrantis anatolica", i.e. areas of tamarisk plants in Artemisietum fragrantis, according to Chapelon (1992 : 453) xerophilous on Festuco-Brometea. K-strategy. In Europe according to Rebel (1903 : 2), Culot (1919 : 6) and Leipnitz (field observation ; pers. comm.) larva monophagous on *Ononis spinosa* and appearing in April and July, according to Rebel (*l.c.*) May and E6. Wiltshire (1957 : 100) mentions only the generic name "*Ononis*" as foodplant in Iraq. In Israel 15 species of *Ononis* occur, but not *O. spinosa* (FP2 : 113f.). Perhaps oligophagous on various species of the genus. According to Chapelon (*l.c.*) also on *Genista* (France).

Phenology (Figs. 29, 30). Dark forms (f. *berytaria*) M4-E5, pale forms (f. *faecataria* : 2nd and 3rd generation) B6-B9. 1 ♂ (B5) from Buteiha rather pale and small (therefore considered here as f. *faecataria*) ; however postmedian line distinct, forewing termen rounded, base of hindwings with many dark scales. 1 ♀ from the same locality (E4) somewhat similar, but much darker, therefore considered here as f. *berytaria*. In the Lebanon according to Ellison & Wiltshire (1939 : 43) dark specimens E3-B6, the pale ones usually B6-E7, but even in August and April. ♀-ratio at light 28%. Not protandrous.

Red List category. Not threatened.

Remarks. More extensive material and rearings are necessary to clear up the status of the various "forms". Preliminarily they have to be considered seasonal forms.

Comibaenini Inoue, 1961

***Microbaena pulchra* (Staudinger, 1897)**

Phorodesma pulchra Stgr. : Staudinger, 1898 : 302.
Euchloris pulchra Stgr. : Amsel, 1933 : 107.
Comibaena (*Euchloris* Hb.) *pulchra* Stgr. : Amsel, 1935 : 240.

Material examined. 1 specimen : **11** : Jerusalem (MNHU : holotype). — **13a** : En Qelet near Jericho ("Georgskloster" Am : 1)

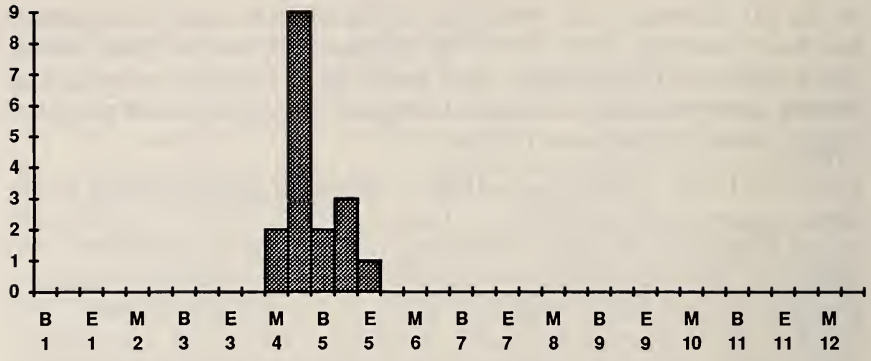


Fig. 29. *Aplasta ononaria* f. *berytaria* : phenology in N. Israel ; n = 17.

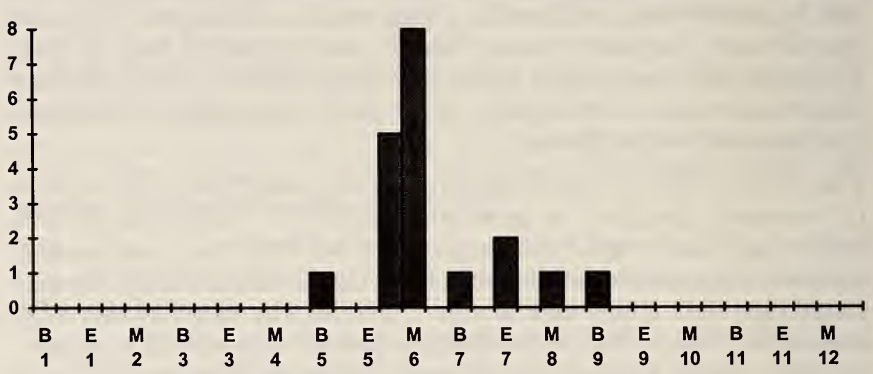


Fig. 30. *Aplasta ononaria* f. *faecataria* : phenology in N. Israel ; n = 19.

Distribution pattern (Map 5). Species AWA ; nominate subspecies endemic to Israel (or "ARA"). There are some doubts concerning the type locality, though the holotype bears the label "Jerusalem" : Staudinger (1898 : 302) notices, that the specimen has been caught at "Jerusalem (perhaps near Jaffa?)". The locality Jaffa (9a : Tel Aviv) would match better the ecological character of the other locality near Jericho. The species occurs (in another subspecies) also in the South of the Arabian Peninsula and in E. and C. Africa. The occurrence of an "AWA-element" near Jerusalem sounds quite improbable.

Ecology. Ecological niche, strategy and larval foodplant unknown.

Phenology. E5 (Amsel, 1935 : 240). In Saudi Arabia E2 (Wiltshire, 1990 : 108).

Red List category. Ex. Last record 1930 (Amsel, *l.c.*).

Proteuchloris neriaria (Herrich-Schäffer, 1852)

Phorodesma neriaria : Staudinger, 1898 : 303.
Euchloris neriaria H.S. : Amsel, 1933 : 107.

Material examined. 77 specimens :**1b** : Banyas (LI : 2) ; Tel Dan (LI : 10) ; Hula Reserve (LI : 38) ; Sede Nehamya (IC : 14). — **4a** : En Afeq (LI : 1). — **7a** : Jordan Park (LI : 4) ; N. Yan Kinneret (LI : 3). — **7b** : Nahal Tavor (LI : 3). — **9a** : Miqve Israel (IC : 1). — **? :** Termoq (IC : 1 ; — Yarmuk, **7a**?).

Distribution pattern (Map 6). MEE, 2. In Israel almost exclusively restricted to the Mediterranean Zone in the North. In C. Israel (coastal area) only isolated relict populations.

Ecology. From – 230 up to 400 m. Probably this species is closely associated with (Tavor-)oak communities. K-strategy? *P. neriaria* from Bulgaria reared without problems on oak leaves (*Quercus* sp. ; pers. comm. by Müller and Gelbrecht, Berlin). In Israel there is one oak species with a distribution matching well that of *P. neriaria*, which is the deciduous Tavor oak, *Quercus* (*Cerris*) *ithaburensis*. Presumably this is the only foodplant of *P. neriaria* in Israel.

Phenology (Fig. 31). M3-E5 ; E5-B8 ; B9-E10. First and second generation overlapping. Specimens from M3-E5 mainly in the Hula Reserve, E5-B8 at Tel Dan, but belonging to two different generations as demonstrated by their different external appearance : first generation larger, yellowish green instead of deep green. In the Lebanon E5 ; June-September (Ellison & Wiltshire, 1939 : 43). ♀-ratio at light 19%. Not protandrous.

Red List category. Not threatened.

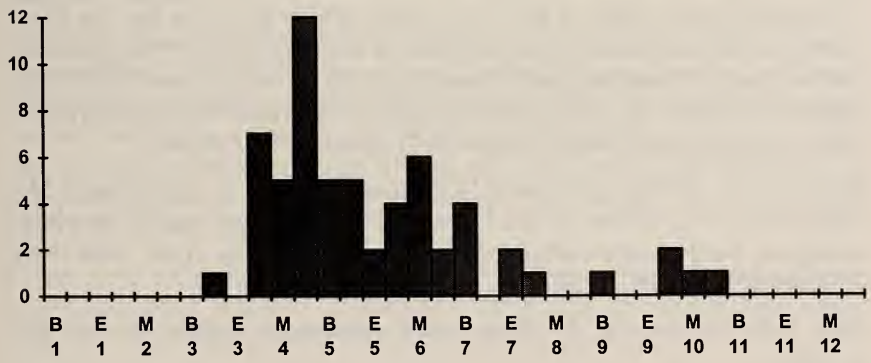


Fig. 31. *Proteuchloris neriaria* : phenology in N. Israel ; n = 61.

Hemistolini Inoue, 1961

***Xenochlorodes olympiaria cremonaria* (Staudinger, 1897)**

Eucrostis olympiaria HS. var. *beryllaria* Stgr. : Kalchberg, 1897 : 179.
Eucrostis olympiaria HS. var.? *cremonaria* Stgr. : Staudinger in Kalchberg, 1897 : 179.
Eucrostes olympiaria H.S. : Amsel, 1933 : 107.
Eucrostes beryllaria Mann : Amsel, 1933 : 107.
Xenochlorodes (*Eucrostes* Hb.) *olympiaria* Mann : Amsel, 1935 : 240.
Xenochlorodes sp. : Halperin & Sauter, 1992 : 242.

Material examined. 13 specimens : **1b** : Hula Reserve (LI : 1) ; Sede Nehamya (IC : 1). — **3** : Haifa (IC : 2 ; ZSM : 2 ; Ka : 5). — **7a** : En Sheva ("Tabgha" Am : 2) ; Deganya (IC : 1). — **11** : Jerusalem (IC : 1 ; ZSM : 1 ; ZMK : 1 ; MNHU : syntype ; Ka : 6) ; Qiryat Anavim (Am : 2) ; Shefela, Avi'ezer (H&S). — **13a** : "Jericho" (Am : 1).

Distribution pattern (Map 7). Species MED, subspecies with typical Levantine distribution (MEE). In Israel in local populations restricted to the Mediterranean Zone and the Lake Kinneret area. Southern border perhaps as described for *Phaiogramma pulmentaria* (see below). Recorded from Jericho "without date" by Amsel (1935 : 240), quite doubtful.

Ecology. From – 210 up to 800 m. Typical species of Mediterranean scrubland. Intermediate strategy? Larva according to Millière (1864 : 268 ; S. Italy) and Rebel (1903 : 4) feeding on *Phillyrea angustifolia* and (suboptimally) *P. media*, "probably in two generations" (Rebel, *l.c.*). According to Halperin & Sauter (1992 : 118) also found on *Phillyrea* (Oleaceae) in Israel. The larva found on *Rhamnus lycioides graeca* (foliage) presumably belongs to this species (Halperin & Sauter, *l.c.* : 242). In Israel the genus *Phillyrea* is represented by one species only, *P. latifolia* (incl. *media* ; FP5 : 15), which is distributed in the Mediterranean influenced area (cf. description of distribution of *Phaiogramma pulmentaria*). *Rhamnus palaestinus* (incl. ssp. *graecus*), one of the four *Rhamnus* species in Israel, shows a similar distribution pattern (FP2 : 305). Rearing is easy with *Ligustrum* (Leipnitz, pers. comm.)

Phenology. E5-E6. In Amsel (1935) also recorded in the decades M3 and E4-A5. Univoltine in the Levant? In S. Europe usually bivoltine emerging until August-September. Lebanon records from June-July (Ellison & Wiltshire, 1939 : 43). ♀-ratio at light 40%.

Red List category. E. Only three specimens caught in the last 60 years.

Victoria plantei Herbulot, 1976

Victoria plantei n.sp. : Herbulot, 1976 : 290.
Victoria plantei Herbulot : Hausmann, 1993 : 53.

Material examined. 5 specimens :**13b** : Sodom (Coll. Herbulot : 4 — type series) ; En Gedi (LI : 4).

Distribution pattern (Map 8). Endemic oasis species apparently restricted to the Dead Sea area.

Ecology. Xerothermophilous species of wadis and oases with *Acacia*-communities. Isolated occurrence (absent e.g. at Neot Hakkikar) and foodplant specialization probably indicating K-strategy. Larval foodplant presumably as in the following species (see below).

Phenology. Apparently univoltine E3-B6. Emergence protandrous (cf. Hausmann, 1993 : 54).

Red List category. E. Rare in isolated habitats. Probably threatened through loss of habitats by desertification and water diversion projects.

Remarks. Springtime specimens from Yotvata (S. Israel) genitalically similar to *V. plantei*. See remarks under following species.

Victoria eremita Hausmann, 1993

Victoria eremita sp. nov. : Hausmann, 1993 : 55.

Material examined. 707 specimens : **14** : Yotvata (LI : 706). — **16c** : Nahal Raham (IC : 1)

Distribution pattern (Map 9). Endemic oasis species (as far as known until now). Possibly more widely distributed in southern Arava Valley, Negev or Sinai.

Ecology. Xerothermophilous species of wadis and oases with *Acacia*-communities. Isolated occurrence and foodplant specialization probably indicating K-strategy. Larva has been found on the epiphytic plant *Loranthus acaciae* (Hausmann, 1993 : 57). This plant occurs as a parasite on various trees and shrubs (mostly on *Acacia* and *Ziziphus*) in the Judean Desert, N. Negev, Lower Jordan Valley, Dead Sea area and in the Arava Valley (FP1 : 46).

Phenology (Fig. 32). M2-E4 (rare) ; E5-B12 (common). Perhaps flying in 4-5 univoltine units (cf. Hausmann, 1993 : 58). ♀-ratio in light traps very low (3%). Emergence protandrous (Hausmann, *l.c.*).

Red List category. Not threatened.

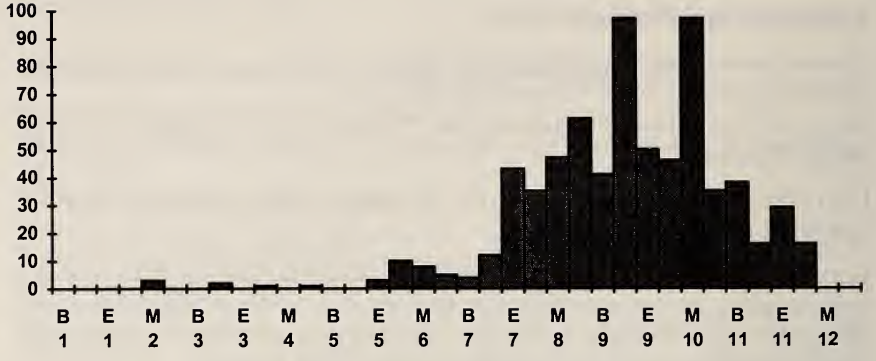


Fig. 32. *Victoria eremita* : phenology at Yotvata, S. Israel ; n = 700.

Remarks. Some recently examined males from M2, M3 and April genitalically resemble *V. plantei.* More information (rearings) is necessary to decide whether they are conspecific with *V. eremita* or with *V. plantei.*

Comostolini Inoue, 1961

Eucrostes indigenata (de Villers, 1789)

Eucrostis indigenata Vill. : Kalchberg, 1897 : 180.
Eucrostes indigenata Vill. : Amsel, 1933 : 107.
Eucrostes indigenata Vill. : Amsel, 1935 : 240.

Material examined. 9 specimens : **1b** : Hula Reserve (LI : 2 ♂♀) ; Sede Nehamya (IC : 5). — **3** : Haifa (Ka). — **11** : Jerusalem (IC : 1 ♀ ; MNHU : 1 ♀) ; En Kerem (Am : 1).

Distribution pattern (Map 10). MED ; constituting an "AFM-complex" with the near ally *Eucrostes disparata* Walker, 1861. In Israel ranging nearly all over the country, but in small, local populations. Absent in the Dead Sea area. According to Amsel (1933) evenly recorded over eremic areas. Compare the occurrence at Aqaba, S. Jordan, 5 km E. of Elat (Hausmann, 1991 : 118). Distribution area perhaps disjunct and divided into one eremic part in the extreme South (with taxonomic affinities to *E. disparata* ?) and a second area in the Mediterranean influenced parts of C. and N. Israel (preference for hills). Possibly a parallel to the species pair *Microloxia herbaria / ruficornis* (Mediterranean/ Paleotropical).

Ecology. From 0 up to 800 m. Found in various habitats where its foodplants occur ; diversity of habitats perhaps caused by disjunct populations with different niche-specialization. Larva feeding "auf

Euphorbia-Arten" (Rebel, 1903 : 4 ; Culot, 1919 : 13 ; Halperin & Sauter, 1992 : 114), according to Prout (1913 : 33) mainly *E. spinosa*. In Israel 34 species of *Euphorbia* occur, but not *E. spinosa* (FP1 : 269ff.). Many of these are locally distributed. In Israel the southern and the northern populations of "*Eucrostes indigenata*" are probably associated with different species of *Euphorbia*.

Phenology. Bivoltine E4-E6 (mainly B6-E6) ; M10-E10. Protandrous emergence according to the few available data. In the Lebanon recorded in June, July and October (Ellison & Wiltshire, 1939 : 43).

Red List category. V.

Thalerini Herbulot, 1963

***Culpinia prouti* (Thierry-Mieg, 1913)**

New for the Fauna of Israel.

Material examined. 2 specimens : **3** : Haifa, Mt. Carmel (IC : 1 ♀). — **11** : En Kerem (IC : 1 ♂).

Distribution pattern (Map 11). Typical Levantine distribution (MEE). In Israel restricted to middle altitudes of the Mediterranean Zone.

Ecology. From 300 (? — Carmel) up to 800 m. Ecological niche, strategy and larval foodplant unknown.

Phenology. B5 (Carmel ; only one date available). Probably univoltine.

Red List category. Ex. Last record probably 1955 (labels incomplete).

Hemitheini Inoue, 1961

***Phaiogramma pulmentaria* (Guenée, 1857)**

Nemoria pulmentaria Gn. : Kalchberg, 1897 : 180.
Nemorla (sic!) *pulmentaria* Gn. var. *palaestinensis* : Fuchs, 1903 : 51.
Nemoria pulmentaria Gu. : Amsel, 1933 : 107.
Chlorissa (*Nemoria* Hb.) *pulmentaria palästinensis* (sic!) Fuchs : Amsel, 1935 : 240.
Chlorissa pulmentaria Guenée : Hausmann, 1991 : 116.

Material examined. 93 specimens : **1a** : Nahal Iyon (LI : 3) ; Metulla (IC : 1) ; Shetula (LI : 2) ; Meron Village (LI : 1). — **1b** : Banyas (LI : 4) ; Sede Nehamya (IC : 9) ; Hula Reserve (LI : 19). — **2** : Nahal Ammud (LI : 7) ; Arbel (LI : 6) ; Oranim (IC : 1). — **4a** : Nahal Keziv (LI : 1) ; En Afeq (LI : 8). — **7a** : Jordan Park (LI : 6) ; N. Yam Kinneret (LI : 8) ; En Sheva

("Tabgha" Am : 1). — **7b** : Nahal Tavor (LI : 10). — **8** : Tulkarm (Ha : 1). — **9a** : Rehovot (IC : 1) ; Tel Aviv (IC : 1). — **11** : Jerusalem (LI : 2 ; Fuchs : 20 specimens) ; Qiryat-Anavim (Am : 1). — **15** : Gilat (LI : 1). — **18** : Senir Qibbuz (LI : 1).

Distribution pattern (Map 12). TUM. In Israel typical Mediterranean distribution pattern : common in N. Israel, less common and perhaps in isolated populations in C. Israel down to the semicircular boundary line Jerusalem-Hebron-Beersheva-Gaza between the Eremic and the Mediterranean Zone. Range of *P. pulmentaria* in Israel almost entirely coinciding with areas with an annual rainfall over 300 mm. Absent from the lower Jordan Valley, the Dead Sea area and the South.

Ecology. From – 230 up to 800 m. Species of open grassland, sometimes becoming abundant everywhere. R-strategy. Larva polyphagous : authors usually note various species of Umbelliferae such as "*Peucedanum*, *Bupleurum*, *Foeniculum*, *Seseli*, *Anthriscus*" etc. as larval foodplants (Dantart, 1990 : 168 ; Forster & Wohlfahrt, 1981 : 12 ; Rebel, 1903 : 4 ; etc.). The author reared the species on *Taraxacum* without any problems (S. Italy) ; according to Wiltshire (1957 : 101) "on *Althaea* (Malvaceae) and other herbs" (Iraq) ; the larva was found on *Paliurus* in S. Dalmatia (Schwingenschuss & Wagner, 1926 : 78) ; Dantart (*l.c.*) cites an old (and doubtful?) mention from N. Spain "*Clematis vitalba*, *Quercus ilex*, *Rosmarinus officinalis*". Suitable foodplants occur all over N. and C. Israel.

Phenology (Fig. 33). E3-E6 ; M8-B9 ; B10-M10. Probably plurivoltine, but only the first generation seems to be fully developed. First generation in the mountains later (B5-E6). ♀-ratio at light low, 13%. Not protandrous.

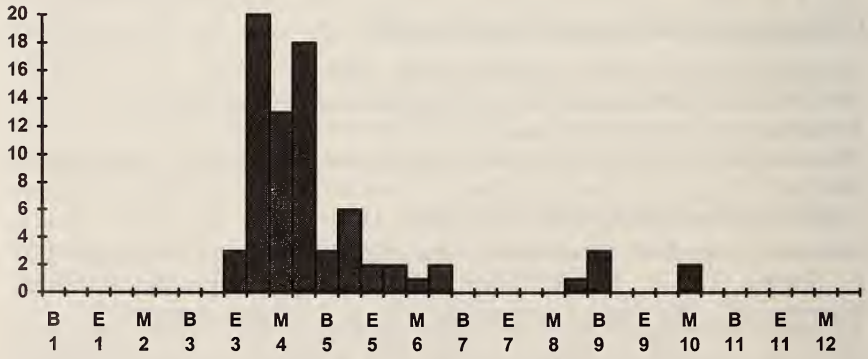


Fig. 33. *Phaiogramma pulmentaria* : phenology in N. Israel ; n = 76.

Red List category. Not threatened.

Remarks. With regard to some erroneous determinations in Amsel (1935) see remarks under *Phaiogramma faustinata*.

Phaiogramma faustinata (Millière, 1868)

Nemoria faustinata Mill. : Amsel, 1933 : 107.
Chlorissa faustinata Millière : Hausmann, 1991 : 116.
Chlorissa faustinata Mill. : Halperin & Sauter, 1992 : 141.
Chlorissa faustinata Mill. : de Bros, 1993 : 90.

Material examined. 300 specimens : **1a** : Nahal Iyon (LI : 2). — **1b** : Hula Reserve (LI : 187) ; Sede Nehamya (IC : 2). — **2** : Nahal Ammud (LI : 6) ; Hartuf (IC : 2) ; Ein Hoab (IC : 1) — **3** : Haifa (IC : 3). — **5** : Yitzre'el (IC : 1). — **6d** : Nahal Tirza (LI : 2). — **7a** : Jordan Park (LI : 6) ; N. Yam Kinneret (LI : 2) ; Hamat Tiberias (de Bros). — **7b** : Nahal Tavor (LI : 8) ; Tirat Zevi (LI : 2). — **8** : Herzliyya (de Bros) ; Nof Yam (IC : 3) "Coastal plain" (H&S). — **9a** : Ashqelon (IC : 1 ; de Bros) ; Tel Aviv (IC : 4) ; Yesodot (IC : 2) ; Ad Halom Bridge (IC : 1). — **10** : Tarum (IC : 2) ; Emeq Ha'Ela Road (IC : 2). — **13a** : Jericho (Ha : 9 ; Coll. Sommerer : 1 ; (=) Am "*C. pulmentaria*" : 3) ; En Qelet ("Georgskloster, *C. pulmentaria*" Am : 1) ; Allenby-Bridge ("*C. pulmentaria*" Am : 1). — **13b** : N. Dead Sea (Ha : 1 ; LI : 1) ; Enot Zuqim (LI : 1) ; Enot Qane (LI : 3) ; En Gedi (LI : 28 ; IC : 1) ; Nahal Arugot (LI : 1) ; Neot Hakikkar (LI : 6). — **14** : Yotvata (LI : 1) ; Arava Valley (H&S). — **15** : Gilat (LI : 6) ; Negev (IC : 2).

Distribution pattern (Map 13). AIM. Distributed almost all over the country, but somewhat unevenly : absent from the mountains ; rare in S. Israel, perhaps taxonomically different (cf. Hausmann, 1996a).

Ecology. From – 400 up to 200 m, exceptionally to 600 m (Nahal Iyon). Thermophilous and ubiquitous in lower-lying areas, usually limited by the isotherm of an annual mean temperature of (at least) 19°C. R-strategy. Very polyphagous : according to Rebel (1903 : 4) and Culot (1919 : 17) larva feeds on *Rosmarinus officinalis* ; according to Leipnitz (pers. comm.) not accepting *Rosmarinus*, but larvae found on flowers of *Ononis* sp., reared on *Daucus carota* ; in N. Africa on *Rhus oxyacantha* (under the name "*Microloxia rhoisaria*" in Prout, 1915 : 415) ; in Nubia and Egypt on *Acacia nilotica* (Fletcher, 1963 ; Andres & Seitz, 1924) ; in Egypt and Israel on *Acacia* sp. (Wiltshire, 1949 : 399f. ; Wiltshire, 1990 : 110 ; Halperin & Sauter, 1992 : 107) ; further foodplants in Israel *Crotalaria* (Fabaceae), *Inula* (Asteraceae), *Prosopis* (Mimosaceae) (Halperin & Sauter, 1992 : 113-121, 141) ; in Morocco larvae found on *Foeniculum dulce*, *Linum grandiflorum* and *Schinus terebinthifolius* (Rungs, 1981 : 225). Its (conspecific?) African

ally *P. stibolepida* Butler occurs in Nigeria as a pest species on cotton (Zhang, 1994 : 132). It is possible that one day *P. faustinata* will be found as a pest species on cotton in Israel.

Phenology (Figs. 34, 35). Plurivoltine species, occurring in all months of the year, mainly M10-M12. Seasonal appearance in N. Israel complementary to that of *P. pulmentaria*. ♀-ratio at light rather low, 9% (e.g. Hula Reserve 5% only).

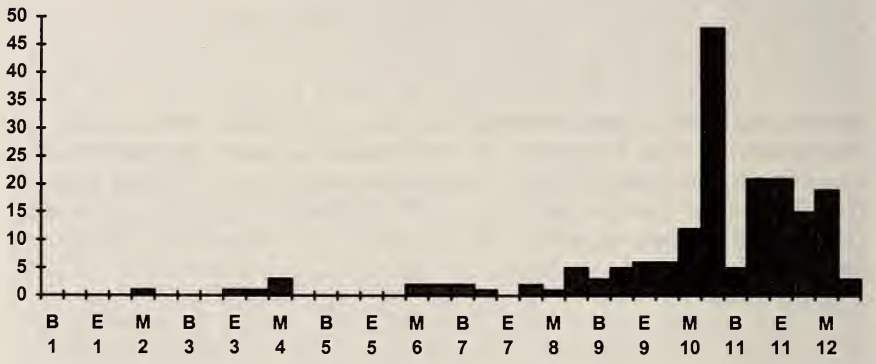


Fig. 34. *Phaiogramma faustinata* : phenology in the Hula Reserve, N. Israel ; n = 185.

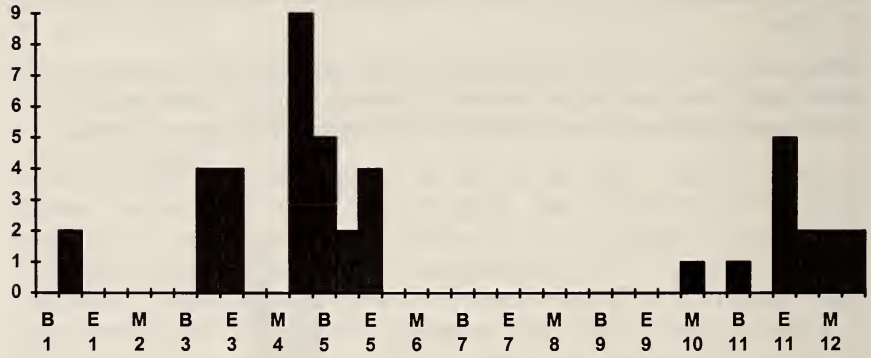


Fig. 35. *Phaiogramma faustinata* : phenology in the Dead Sea area, C. Israel ; n = 43.

Red List category. Not threatened.

Remarks. One original specimen leg. Amsel from Jericho (31.5.1930), identified and published as "*Chlorissa* (*Nemoria* Hb.) *pulmentaria palästinensis* Fuchs", has been examined by the author. Its true identity is *Phaiogramma faustinata*. Since no record of *P. pulmentaria* from

the Lower Jordan Valley is yet known, preliminarily all the records from there (Amsel) have to be regarded as applying to *P. faustinata*. Genitalia of one ♂ examined from Gilat with three fields of aedeagal cornuti, as in specimens from N. and C. Israel (cf. Hausmann, 1996a).

Neromia pulvereisparsa jodisata Staudinger, 1898

Nemoria ? (*Neromia*) *jodisata* Stgr. : Staudinger, 1898 : 304.
Neromia jodisata Stgr. : Amsel, 1933 : 107.
Neromia pulvereisparsa Hmps. (= *jodisata* Stgr.) : Amsel, 1935 : 240.
Neromia pulvereisparsa Hampson : Halperin & Sauter, 1992 : 142.

Material examined. 297 specimens : **12** : "Judean Desert" (H&S). — **13a** : Jericho (LI : 2 ; Am : not rare) ; En Qelet ("Georgskloster" Am : not rare) ; Jordan Valley (St : 3). — **13b** : N. Dead Sea (LI : 3) ; Dead Sea environs (H&S) ; Enot Zuqim (LI : 9) ; Enot Qane (LI : 11) ; En Gedi (LI : 24 ; IC : 2) ; Nahal Arugot (LI : 1) ; Neot Hakikkar (LI : 31). — **14** : Yotvata (LI : 213) ; Arava Valley (H&S). — **15** : Gilat (LI : 1).

Distribution pattern (Map 14). Species SAS ; subspecies "endemic" to Israel and Jordan ; populations from Egypt, Sudan and Libya (Tibesti) perhaps to be ascribed to *N. p. jodisata*. Typical distribution pattern of "eremic species" in Israel with centre in the Arava Valley. Northern distribution limit coinciding with the (desert-) isohyet of annual rainfall under 150 mm. Sinai : Bir Isla and El Arish, one specimen each (Wiltshire, 1949 : 400).

Ecology. From – 400 up to 150 m. Desert moth, xerothermophilous and ubiquitous in the South. R-strategy. Polyphagous : foodplants according to Wiltshire (1949 : 400 ; 1990 : 110) "*Ochradenus* and probably other desert herbs" ; according to Andres & Seitz (1924) *Ochradenus baccatus* (Egypt) ; in Israel according to Halperin & Sauter (1992 : 115, 117) on foliage of *Gymnocarpos* (Caryophyllaceae) and *Ochradenus* (Resedaceae). Both foodplants *Gymnocarpos decandrum* and *Ochradenus baccatus* are the only species of their genus present in Israel. Their distribution patterns in Israel match exactly that of *Neromia pulvereisparsa* (FP1 : 130, 330).

Phenology (see Figs. 36, 37). Plurivoltine species, occurring in all months of the year ; in the Dead Sea area with peak of abundance in April, at Yotvata mainly B8-B12. ♀-ratio at light 21%.

Red List category. Not threatened.

Kuchleria gisisi Hausmann, 1995

Kuchleria gisisi sp. nov. : Hausmann, 1995a : 588.

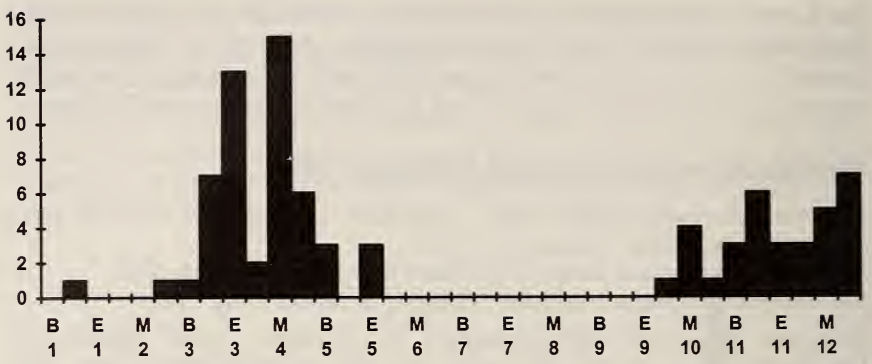


Fig. 36. *Neromia pulvereisparsa jodisata* : phenology in the Dead Sea area, C. Israel ; n = 85.

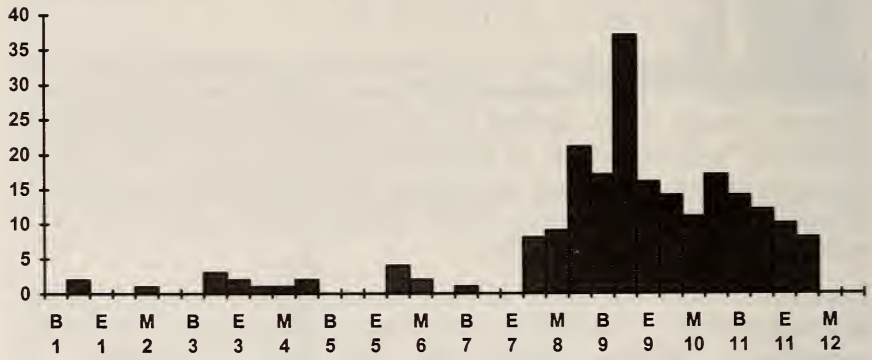


Fig. 37. *Neromia pulvereisparsa jodisata* : phenology at Yotvata, S. Israel ; n = 213.

MATERIAL EXAMINED. 2 specimens : **9a** : Tel Aviv (IC : ♂ holotype). — **11** : Qiryat Anavim (IC : ♀ paratype)

DISTRIBUTION PATTERN (Map 15). Apparently an endemic species.

ECOLOGY. From 0 up to 500 m. Ecological niche unknown. Probably K-strategy. Larva of the near ally *K. ephedrae* in Morocco found on *Ephedra nebrodensis* (Prout, 1935 : 16). Foodplant of *K. gisisi* very probably *Ephedra campylopoda*, which is distributed in the Acco Plain, Sharon Plain, Upper and Lower Galilee, Mt. Carmel, Esdraelon Plain, Samaria, Shefela and Judean Mts (FP1 : 23). Three further *Ephedra* species, occurring as desert plants in the southern parts of Israel, do not match the distribution pattern of *Kuchleria gisisi.*

Phenology. B3 (♀, paratype) ; M10 (♂, holotype). Apparently at least two generations ; ♂ from Tel Aviv rather small as often the case in autumnal generations.

Red List category. Ex. Last catch 1961.

Microloxiini Hausmann, 1996

***Microloxia herbaria* (Hübner, [1813])**

Eucrostis herbaria Hb. : Kalchberg, 1897 : 179.
Eucrostes herbaria Hb. : Amsel, 1933 : 107.
Microloxia (*Eucrostes* Hb.) *herbaria advolata* Ev. : Amsel, 1935 : 240.

Material examined. 21 specimens : **1a** : Nahal Iyon (LI : 6). — **1b** : Hula Reserve (LI : 3) ; Sede Nehamya (IC : 3). — **2** : Nahal Ammud (LI : 4). — **3** : Haifa (IC : 2 ; Ka). — **4a** : En Afeq (LI : 1). — **7a** : En Sheva ("Tabgha" Am : 1). — **7b** : "Hamdia" (Hamadya ; IC : 1). — **11** : En Kerem (Am : 1) ; Bethlehem (Coll. Sommerer : 1).

Distribution pattern (Map 16). TUM ; constituting an AIM species complex with the near ally *Microloxia ruficornis* Warren, 1897. Local and small populations in N. Israel. One ♂ from Betlehem (11.VI.1931, leg. Amsel, coll. Sommerer) large, forewing length 8.5 mm, postmedian lines strongly marked as in N. Israeli *M. herbaria*, palpi ochraceous ; therefore it is ascribed to *M. herbaria* (cf. Hausmann, 1995a : 573). Occurrence in C. Israel however awaits verification with more extensive material. The actual known distribution resembles that of *Xenochlorodes olympiaria cremonaria* (see above) ; however the entire distribution in Israel will eventually prove similar to that of *Phaiogramma pulmentaria* (see above).

Ecology. From – 210 up to 700 m. In the Mediterranean Zone in different habitats, mainly open grassland. Probably r-strategy (cf. *Microloxia ruficornis*). Larva on *Teucrium capitatum* (Rebel, 1903 : 4 ; Prout, 1913 : 26 ; S. Europe) ; in nature found near the coast on flowers of *Helichrysum* sp. (*stoechas* ? ; Leipnitz, pers. comm. ; S. Europe) ; rearing is possible on *Artemisia* sp. (Gelbrecht, pers. comm. ; S. Europe). Foodplant spectrum probably including many other plant species. In Israel distribution of *Helichrysum sanguineum* (here the only species of its genus) corresponds well to that of *Microloxia herbaria* (FP3 : 312). The genus *Teucrium* is represented by 11 species (not *T. capitatum*), most of these widely distributed in N. and C. Israel (FP3 : 101f.).

Phenology. M3-B4 ; B6 ; B8-M10. At Hamadya M5. Bivoltine or plurivoltine. ♀-ratio at light small (11%). Not protandrous according to the few available data.

Red List category. R. Nowhere recorded abundantly.

Microloxia ruficornis Warren, 1897

Microloxia (*Eucrostes* Hb.) *herbaria advolata* Ev. : Amsel, 1935 : 240 (partim). *Microloxia herbaria* Hübner : Hausmann, 1991 : 116.

Material examined. 152 specimens : **13a** : Jericho (LI : 3 ; Am : 3 ; Coll. Sommerer : 1) ; En Qelet ("Georgskloster" Am : 1). — **13b** : N. Dead Sea (Ha : 3) ; Enot Zuqim (LI : 15) ; Enot Qane (LI : 2) ; En Gedi (LI : 32) ; Nahal Arugot (LI : 5) ; En Boqeq ("Ein Bokek", ZMK : 1) ; Neot Hakikkar (LI : 16). — **14** : Yotvata (LI : 73). — **15** : Gilat (LI : 1).

Distribution pattern (Map 17). AIM. In Israel shows typical pattern of an "eremic species" with centre of distribution in the Arava Valley. Distribution very similar to that of *N. pulvereisparsa*. Correlation with 150 mm isohyet, see remarks under *N. pulvereisparsa*. One ♂ from Gilat (LI) with typical features of *M. ruficornis* (see Hausmann, 1995a : 576). In specimens from the Sinai (Sta. Katherina monastery ; Wiltshire, 1949 : 403) wing pattern described as similar to *M. herbaria* ; to be verified.

Ecology. From – 400 up to 150 m. Desert moth, xerothermophilous and ubiquitous in the South. Continuous distribution, continuous seasonal appearance, ♀ with many eggs indicating r-strategy. Larva of NW. African "*halimaria*" (synonym of *ruficornis*) on *Atriplex halimus* (Prout, 1913 : 26) ; in Lower Egypt bred on *Pluchea dioscoridis*, but determination of moth according to Wiltshire (1949 : 402) not completely certain. Distribution of *Atriplex halimus* in Israel matches well that of *Microloxia ruficornis*, 9 further species of *Atriplex* occur in Palestine (FP1 : 143f.). *Pluchea dioscoridis*, the only species of its genus in Israel, is distributed mainly in the South, but ranges northwards to the Upper Jordan Valley and the Golan (FP3 : 302).

Phenology (Figs. 38, 39). Plurivoltine species, occurring in all months of the year ; in the Dead Sea area with abundance peak in April ; at Yotvata one peak A6 (unusual for the locality), then common E7-E11. ♀-ratio at light 28%. Strongly protandrous in the Dead Sea area, ♀ mainly in May and December.

Red List category. Not threatened.

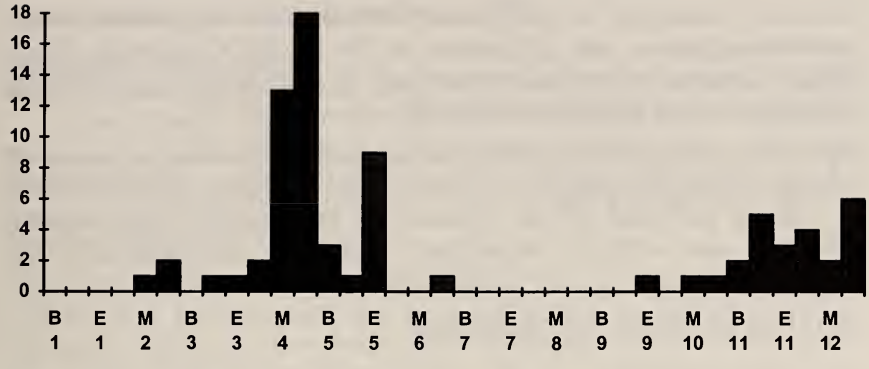


Fig. 38. *Microloxia ruficornis* : phenology in the Dead Sea area, C. Israel ; n = 77.

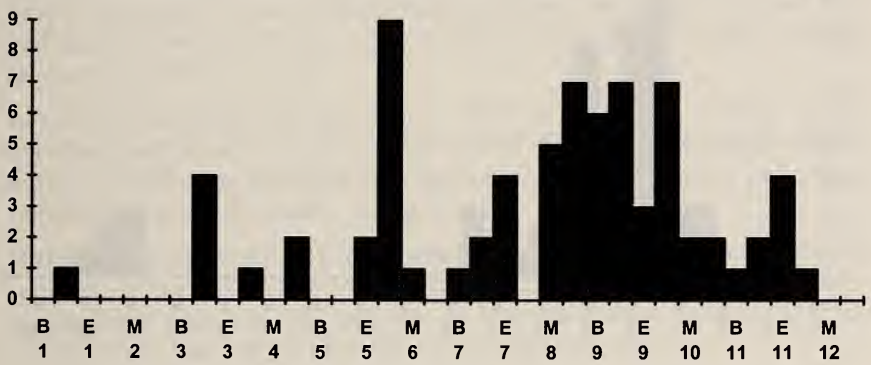


Fig. 39. *Microloxia ruficornis* : phenology at Yotvata, S. Israel ; n = 74.

Acidaliastis micra Hampson, 1896

New for the Fauna of Israel.

Material examined. 353 specimens : **1a** : Meron Village (LI : 1). — **13b** : Enot Zuqim (LI : 2) ; En Gedi (LI : 30) ; Neot Hakikkar (LI : 23). — **14** : Yotvata (LI : 296). — **15** : Gilat (LI : 1).

Distribution pattern (Map 18). SAA. In Israel shows typical pattern of an "eremic species" with centre of distribution in the southern parts of the Arava Valley. On warm nights with southerly winds single specimens wander up north without being able to reproduce there (e.g. 18.11.1988 : Meron Village ; cf. *Hemidromodes sabulifera hessa*). Occurs also in E. Sinai, Noucibat (Wiltshire, 1949 : 403) and S. Jordan, Aqaba (Hausmann, 1991 : 118).

Ecology. Successful at sites from – 400 up to 150 m. Desert moth, xerothermophilous and ubiquitous in the South. Continuous distribution, continuous seasonal appearance, ♀ with many eggs indicating r-strategy. Larval foodplant unknown.

Phenology (Figs. 40, 41). Plurivoltine species, occurring in nearly all months of the year (M2-E11) ; in the Dead Sea area mainly M3-M4, at Yotvata one peak E5/B6 (unusual for the locality), then common B8-M9. ♀-ratio at light comparatively high (42%). Protandrous in the Dead Sea area.

Red List category. Not threatened.

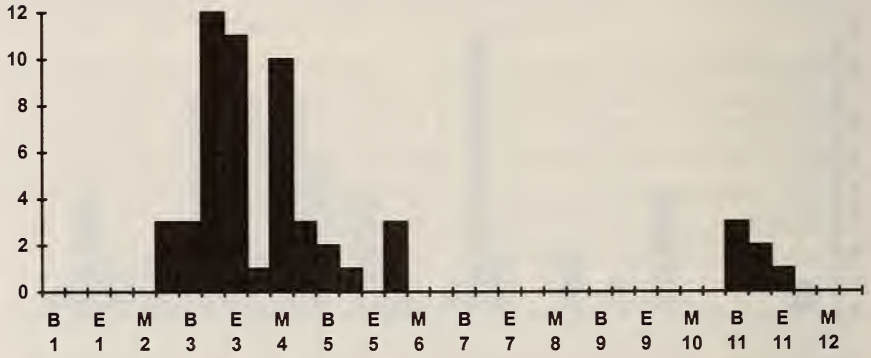


Fig. 40. *Acidaliastis micra* : phenology in the Dead Sea area, C. Israel ; n = 55.

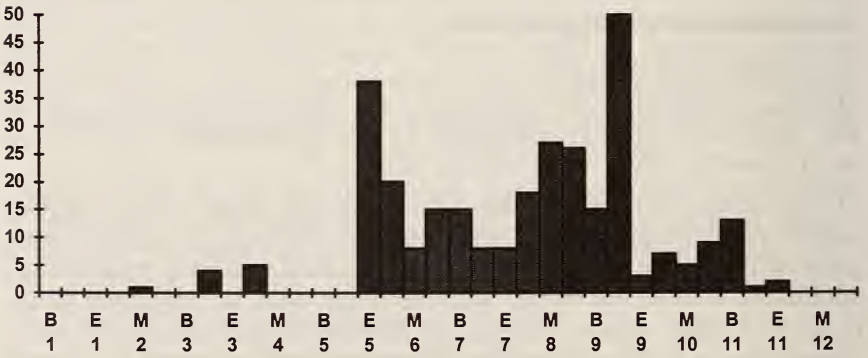


Fig. 41. *Acidaliastis micra* : phenology at Yotvata, S. Israel ; n = 298.

Hemidromodes sabulifera hessa Prout, 1935

New for the Fauna of Israel.

Hemidromodes sabulifera hessa subsp. n. : Prout, 1935 : 16 (locus typicus : Ghor el Safieh on the Jordan side of the border near Neot Hakikkar).

Material examined. 641 specimens : **1a** : Meron Village (LI : 1). — **1b** : Hula Reserve (LI : 2). — **13b** : N. Dead Sea (LI : 1) ; Enot Zuqim (LI : 9) ; En Gedi (LI : 150) ; Neot Hakikkar (LI : 65). — **14** : Yotvata (LI : 410). — **15** : Gilat (LI : 2).

Distribution pattern (Map 19). Species ARS ; subspecies "endemic" to Israel and Jordan ; with centre of distribution in the Arava Valley. On warm nights with southerly winds single specimens wander up to the north probably without being able to reproduce there (e.g. 20.11.1988 : Meron Village ; cf. *Acidaliastis micra*). Northern breeding limit presumably in the Jordan Valley half way between the Dead Sea and Lake Kinneret ; cf. occurrence in the Lower Zerqa Valley, Jordan (Hausmann, 1991 : 116).

Ecology. Successful at sites from – 400 up to 150 m. Desert moth, xerothermophilous and ubiquitous in the South. Continuous distribution, continuous seasonal appearance, ♀ with many eggs indicating r-strategy. Larval foodplant unknown.

Phenology (Figs. 42, 43). Plurivoltine species, occurring in nearly all months of the year (M2-E12) ; exceptionally high abundance peaks in the Dead Sea area M3 and E4, at Yotvata mainly E5-B11. ♀-ratio at light quite low (16%). Emergence strongly protandrous.

Red List category. Not threatened.

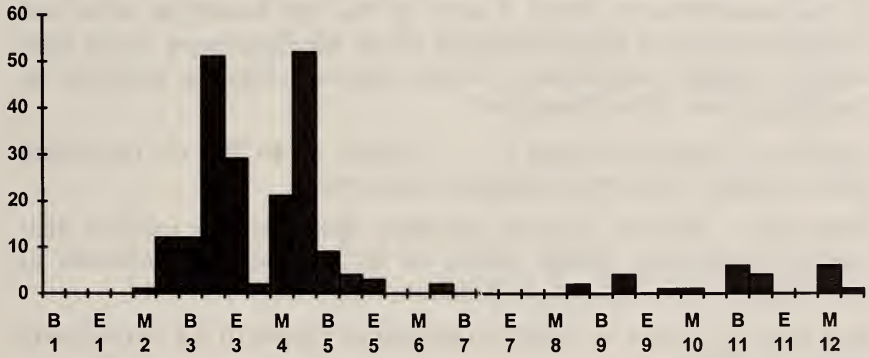


Fig. 42. *Hemidromodes sabulifera hessa* : phenology in the Dead Sea area, C. Israel ; n = 223.

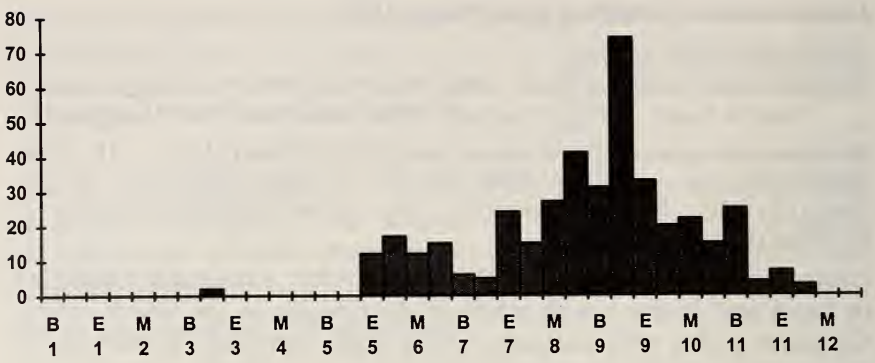


Fig. 43. *Hemidromodes sabulifera hessa* : phenology at Yotvata, S. Israel ; n = 410.

Hierochthonia semitaria (Püngeler, 1901)

Eucrostes semitaria sp. n. : Püngeler, 1901 : 333.
Eucrostes pulverata Warr. : Amsel, 1933 : 107.
Hierochthonia (*Eucrostes* Hb.) *pulverata* Warr. (=*semitaria* Püng.) : Amsel, 1935 : 240.

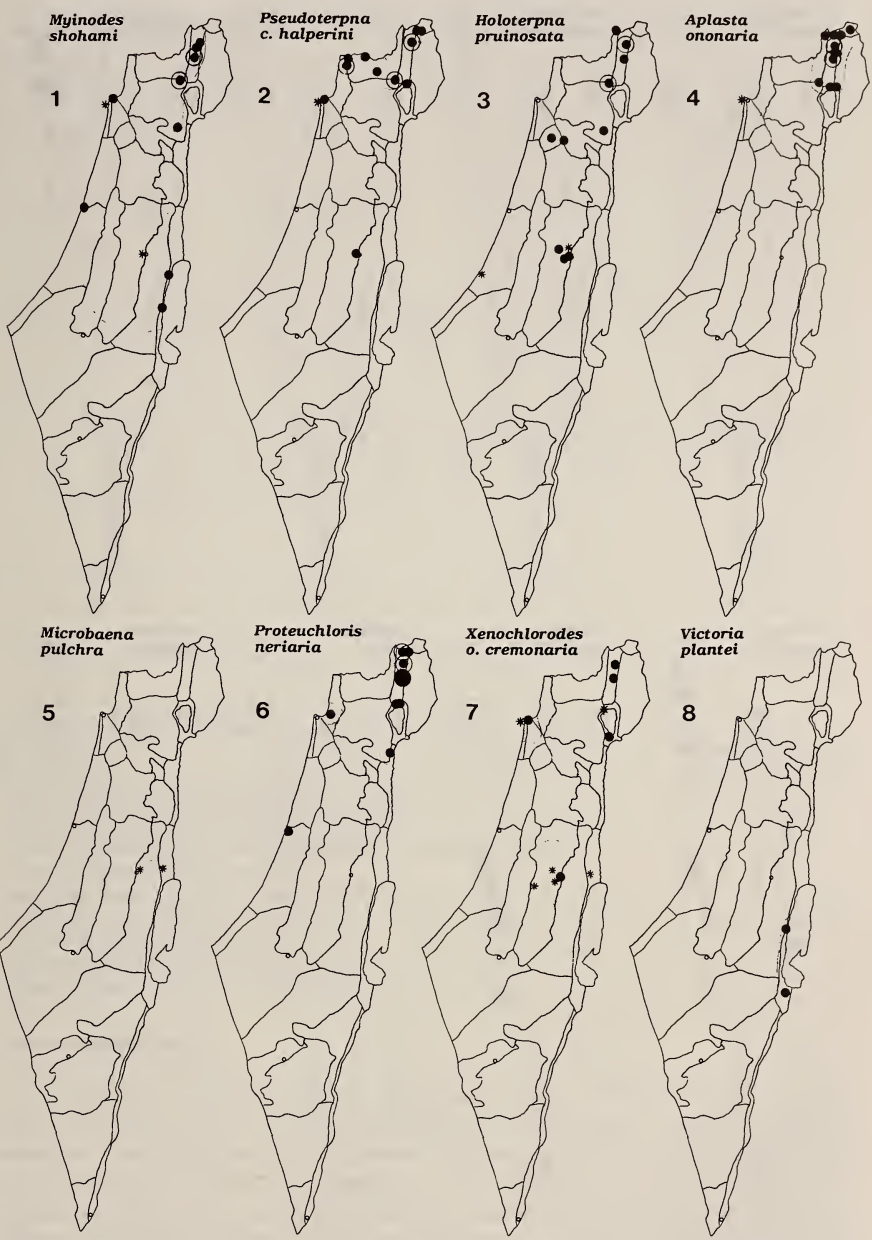
Material examined. 6 specimens : **3** : Carmel (IC : 1 ; Am : 1). — **11** : Jerusalem (LI : 1 ; IC : 2) ; En Kerem (Am : c). — **13a** : "Dead Sea" (MNHU : 2 types).

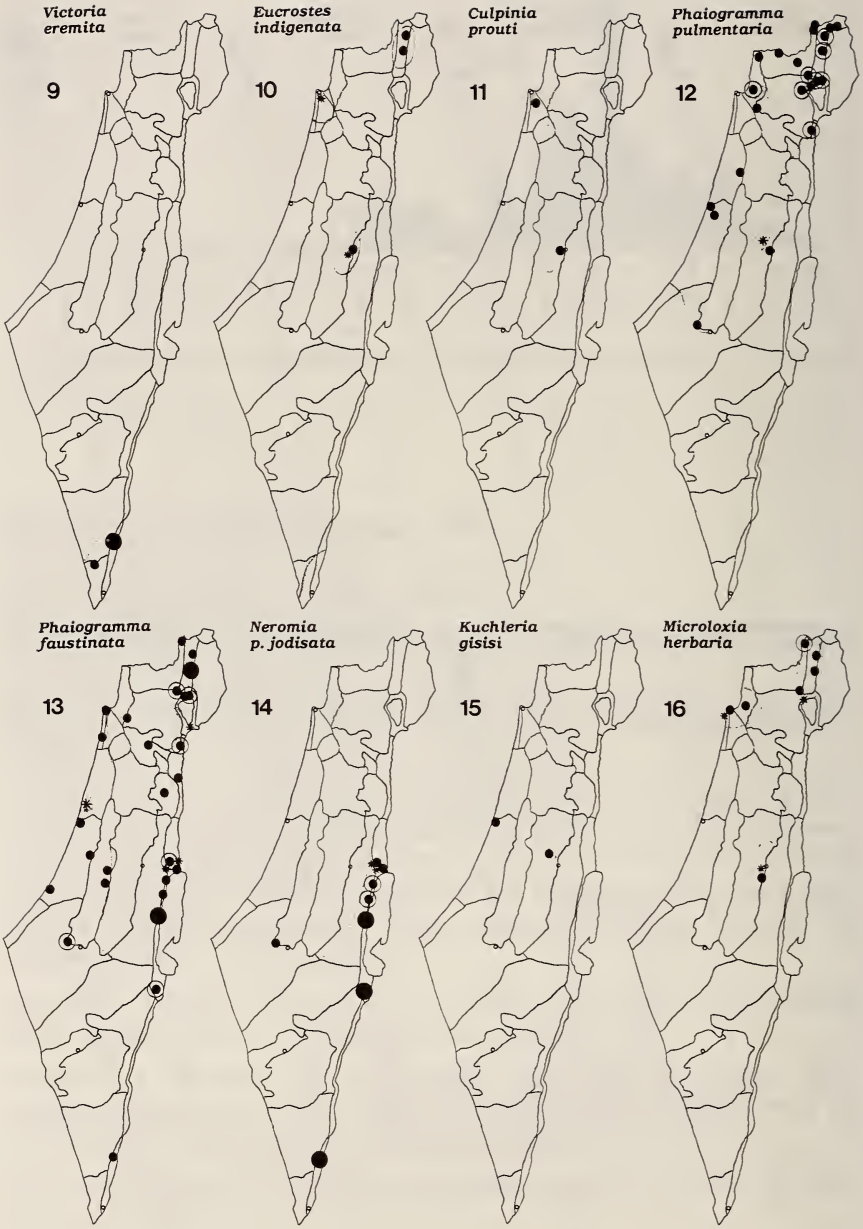
Distribution pattern (Map 20). Typical species of the Levant (MEE) ; in the Lebanon and S. Turkey replaced by the allopatric sister species *H. pulverata* (Warren, 1901). Except for the type locality in Israel and Jordan restricted to middle altitudes of the Mediterranean Zone. Type locality perhaps mislabelled ; in the original reference specified as "northern coast of the Dead Sea".

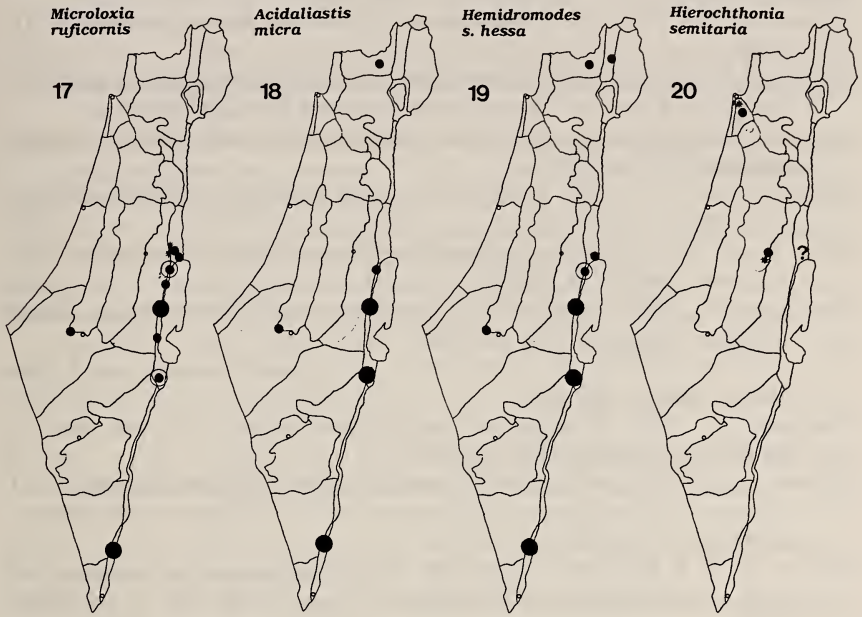
Ecology. Usually from 300 (? — Carmel) up to 800 m. Ecological niche, strategy and larval foodplant unknown.

Phenology. B4-M6. The few available data seem to indicate protandrous emergence. Flight period of the near ally *H. pulverata* in the Lebanon : July (Ellison & Wiltshire, 1939 : 43).

Red List category. E. Only two specimens caught in the last 60 years (1961 and 1992).







Red List of Threatened Geometridae of Israel (Part 1)

Species	RL-category
Holoterpna pruinosata (Staudinger, 1898)	R
Microbaena pulchra (Staudinger, 1897)	Ex
Xenochlorodes olympiaria cremonaria (Staudinger, 1897)	E
Victoria plantei Herbulot, 1976	E
Eucrostes indigenata (de Villers, 1789)	V
Culpinia prouti (Thierry-Mieg, 1913)	Ex
Kuchleria gisisi Hausmann, 1995	Ex
Microloxia herbaria (Hübner, [1813])	R
Hierochthonia semitaria (Püngeler, 1901)	E

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