



SHILAP Revista de Lepidopterología

ISSN: 0300-5267

avives@eresmas.net

Sociedad Hispano-Luso-Americana de
Lepidopterología
España

Kravchenko, V. D.; Orlova, O. B.; Fibiger, M.; Ronkay, L.; Mooser, J.; Li, C.; Muller, G. C.
The Heliothinae of Israel (Lepidoptera: Noctuidae)

SHILAP Revista de Lepidopterología, vol. 33, núm. 131, septiembre, 2005, pp. 365-374

Sociedad Hispano-Luso-Americana de Lepidopterología

Madrid, España

Available in: <http://www.redalyc.org/articulo.oa?id=45513114>

- How to cite
- Complete issue
- More information about this article
- Journal's homepage in redalyc.org

redalyc.org

Scientific Information System

Network of Scientific Journals from Latin America, the Caribbean, Spain and Portugal

Non-profit academic project, developed under the open access initiative

The Heliothinae of Israel (Lepidoptera: Noctuidae)

V. D. Kravchenko, O. B. Orlova, M. Fibiger, L. Ronkay,
J. Mooser, C. Li & G. C. Muller

Abstract

The distribution, flight period and abundance of the ten Israeli Heliothinae species are summarized. During this survey all known species and an additional new record for Israel *Periphantes delphinii* were collected. The distribution pattern, phenology, and association of these species with different biotopes in Israel are described.

KEY WORDS: Lepidoptera, Noctuidae, Heliothinae, biotopes, Israel.

Los Heliothinae de Israel (Lepidoptera: Noctuidae)

Resumen

Se resume la distribución, periodo de vuelo y la abundancia de diez especies de Heliothinae israelíes. Durante este reconocimiento se recogen todas las especies conocidas y se añade una nueva *Periphantes delphinii* para Israel. Se describe la distribución, fenología y asociación de estas especies con los diferentes biotopos en Israel.

PALABRAS CLAVE: Lepidoptera, Noctuidae, Heliothinae, biotopes, Israel.

Introduction

Israel is located at the eastern part of the Mediterranean Basin in the northern part of the Syrian East African Rift Valley (PICARD, 1943). The alternating geographical and climatic zones of Israel create a rich fauna and flora with a divert origin, often on its furthest point of geographical distribution (FURTH, 1975).

Though Israel is located in the 20° C isotherm of annual temperature (BEAUMONT, BLAKE & WAGSTAFF, 1976; BIEL, 1944) the annual average temperature fluctuates from 17° C in the hills, to 25° C in the Jordan Valley (ASHBEL, 1951). Normally the temperature drops abruptly in November, and reaches a minimum in January or February. In spring the temperatures rise gradually to peak in summer around 40° C (ASHBEL, 1951). The bulk of the annual rainfall (70%) occurs between November and February, with little rain in spring and a pronounced drought from June to August. The annual rainfall decreases from 1500 mm on Mt Hermon in the north to 15 mm near the golf of Eilat in the south (ASHBEL, 1951). The plants of Israel belong to five phyto-geographic regions (ZOHARY, 1966), the Mediterranean, Irano-Turanian, Saharo-Arabian, Tragacant and the Ethiopian penetration zone. Areas receiving annually more than 350 mm rainfall belong to the Mediterranean or temperate Zone (ZOHARY, 1962), areas with less than 200-300 mm winter rainfall, support only steppes and grassland they belong to the Irano-Turanian Zone. The Saharo-Arabian eremic zone is a true desert with less than 200 mm winter rainfall. The Rift Valley with even less rain supports near springs numerous tropical pockets (ZOHARY & ORSHANSKY, 1949) these oases are penetrated by Ethiopian fauna and flora.

V. D. KRAVCHENKO, O. B. ORLOVA, M. FIBIGER, L. RONKAY, J. MOOSER, C. LI & G. C. MULLER

On the peak of Mt Hermon (above 1900 m) typical Tragacanth vegetation is found which tolerates very low temperatures and snow in winter and hot droughts in summer.

About 400 Heliothinae species are presently world wide known (MITTER *et al.*, 1993), some of them are serious vegetables pests (AVIDOV & HARPAZ 1969; BODENHEIMER, 1930). In the Levant 10 species are known (HACKER, 2001). Their larvae usually develop on flowers and fruits of herbaceous plants. The major Heliothinae pests are typically polyphagous with a high fecundity (KRAVCHENKO, 1984), however most Heliothinae are oligophagous, or even monophagous (MITTER *et al.*, 1993).

In the early 20th century, seven Israeli species of Heliothinae were summarized by AMSEL (1933, 1935a, 1935b). YATHOM (1971) described the distribution and phenology of these species. Later on, during this survey another two species were added to the fauna of Israel (HACKER & SCHREIER, 2001; HACKER *et al.*, 2001; KRAVCHENKO *et al.*, 2001a; KRAVCHENKO *et al.*, 2001b).

Material & Methods

Within the Israeli-German project for the study of the Israeli Lepidoptera fauna, intensive collecting was conducted from 1986-2004. This project was a joint effort of The Hebrew University, Tel Aviv University, the Nature Reserves and Park Authority of Israel, the Zoologische Staatssammlung Munich in Germany and Museum Witt, Munich, Germany. Lepidoptera were collected during a period of 18 years totalling about 3000 nights of mobile light traps powered by generator (250 Watt bulbs HQL & ML) and about 1500 nights of mobile light trap systems powered by batteries (12 Volt 8 Watt & 20 Watt, 6 Volt 4 Watt Black light UVB tubes) moved on a daily basis. Additionally an intensive network of permanent light traps (220 V 20 W Black light UVB & UVC tubes) was maintained. Traps were relocated on an annual basis. From year to year 10-34 traps were operated.

Characterization of abundance

Rare: less than 10 specimens per year from all sites. Fairly common: an average of 11-50 specimens per site per year and in less than 20% of the collecting sites in the zone of occurrence. Common: an average of 51-200 specimens per site per year and from 20 to 60% of the collecting sites in the zone of occurrence. Abundant: an average of more than 200 specimens per site per year and in more than 60% of the collecting sites in the zone of occurrence. Local: only found in one zone in less than 4 locations. Locally common: in less than 20% of the surveyed sites. Locally abundant: in less than 20% of the surveyed sites.

Faunistic survey of the subfamily Heliothinae

Heliothis virescens (Hufnagel, 1766)

Distribution pattern: Ponto-Mediterranean. From central England through Europe to the Altai Mountains, to Morocco and Algeria. In England only an irregular migrant. Not found in the East Palaearctic region. Recorded in all the Levant countries. In Israel: In this survey only found on the Upper Golan Heights, the Hula Valley and Mt Hermon (400-1600 m). Rare. In the survey of YATHOM (1971) the species was fairly common on medium elevations of the Temperate zone including the Judean Mts.

Bionomics: Univoltine (in Israel), summer, grasslands with shrubs.

Flight period: March - July; peak in May.

Host plants: the larvae are polyphagous on herbaceous plants including species of *Linaria*, *Silene*, *Melandrium*, *Ononis*, *Crepis* and *Trifolium*.

Heliothis nubigera (Herrich-Schäffer, 1851)

Distribution pattern: Pan-Eremic. All kind of arid areas in the Palaearctic. Recorded from all the

THE HELIOTHINAE OF ISRAEL

Levant countries. In Israel: Abundant in the Semi-Arid zone, common in the Coastal Plain. In the Arid zone fairly common; rare in oases.

Bionomics: Probably bivoltine with summer aestivation, steppe species.

Flight period: throughout the year; peaks in April - May and in August - October.

Host plants: the larvae are polyphagous on wild herbaceous plants. In Israel larvae were found in May and July in the Judean Desert and the Northern Negev on foliage of: *Atriplex halimus*, *Retama raetam*, *Suaeda asphaltica*, *Zygophyllum dumosum* (HALPERIN & SAUTER, 1991-1992).

Heliothis peltigera ([Denis & Schiffermüller], 1775)

Distribution pattern: Paleo-Tropical. Central and Southern Europe, Turkey, Iraq, Iran. Recorded from all the Levant countries. In England known as an annual migrant. In Israel: All over the country, abundant. In the Arid zone concentrating in oases.

Bionomics: Probably bivoltine with summer aestivation, steppe species.

Flight period: throughout the year; peaks in April - May and in August - October.

Host plants: the larvae are polyphagous on wild herbaceous plants, occasionally pests of garden Rift Valley (Dead Sea area, Jericho, En Gedi Nature Reserve, Ne'ot Ha'Kikar and the northern part of the Arava Valley in Hazeva). Rare.

Bionomics: Univoltine, spring, deserticolous species.

Flight period: March.

Host plants: Larvae feed on *Gypsophila* spp. (Caryophyllaceae).

Helicoverpa armigera (Hübner, [1808])

Distribution pattern: Paleo-Tropical. Through the subtropics and tropics of the Old World. Also found in the Central Sahara. Recorded from all the Levant countries. In Northern Europe a regular migrant. In Israel: All over the country. Abundant. In the Arid zone concentrating in oases.

Bionomics: Multivoltine with summer aestivation, ubiquitous, in all kinds of open areas.

Flight period: Throughout the year; peaks in May - June and in August - September.

Host plants: The larvae are polyphagous on a wide range of plants including cotton, chickpeas, tomatoes and sunflowers. In Israel a serious pest of corn, peanuts, cotton and other agricultural plants (RIVNAY, 1962). Occasionally on leaves of wild plant like *Inula viscosa* (HALPERIN & SAUTER, 1991-1992).

Schinia scutosa ([Denis & Schiffermüller], 1775)

Distribution pattern: Trans-Palaearctic. From Europe to southern Siberia, the Near and the Middle East and from Central Asia to Japan. In North Africa from Morocco to Egypt. In the Levant recorded only from Israel. In Israel: In the Western Negev and in the Coastal Plain. Locally common.

Bionomics: Univoltine (in Israel), early-summer, steppe species.

Flight period: March - June.

Host plants: The larvae feed on flowers and seeds of *Artemisia* and *Chenopodium*.

Periphanes delphinii (Linnaeus, 1758)

Distribution pattern: Ponto-Mediterranean. Europe, the Near and the Middle East and North Africa. This species was once widespread in Central Europe, now it is extinct in most localities. In the Levant recorded only from Syria and Israel. In Israel: One specimen was collected in the Upper Galilee (Elon, 18-V-1946, Bytinski-Salz) and one on the Golan Heights (Lehavot, 8-IV-1975, Shoham Z.). A third specimen was collected by Orlova & Muller on the southern Golan Heights (400 m), mid-June 2001. These locations are covered by sparse park forests with huge oak trees and a rich undergrowth of herbaceous plants. Apart from some grazing of cows there are no other agricultural activities in the vicinity. Rare and local. This is a new record for the fauna of Israel.

Bionomics: Univoltine, summer, meadow-steppe with shrubs.

Flight period: April, May.

V. D. KRAVCHENKO, O. B. ORLOVA, M. FIBIGER, L. RONKAY, J. MOOSER, C. LI & G. C. MULLER

Host Plants: Larvae feed on flowers and seeds of *Delphinium* (Ranunculaceae), *Aconitum* and *Consolida*.

Pyrrhia treitschkei (Frivaldsky, 1835)

DISTRIBUTION PATTERN: Ponto-Mediterranean. Turkey, Caucasus, the Balkans, Iran. In the Levant recorded only from Lebanon and Israel. In Israel: Mainly above 400 m in the Temperate zone (the Judean Mts., the Carmel Ridge and Mt Hermon). Common on Mt Hermon (2000 m in the Tragacanth vegetation), elsewhere - rare.

Bionomics: Univoltine, summer, mountainous steppe species.

Flight period: May - June.

Host plants: the larvae feed on *Scutellaria peregrina* (Labiatae).

Aedophron phlebophora (Lederer, 1858)

Distribution pattern: Irano-Turanian. Turkey, Iraq, Iran, Armenia. In the Levant recorded from Syria, Jordan and Israel. In Israel: Mt Hermon (1600 - 2000 m mainly in the Tragacanth zone), Judean Mts. (AMSEL, 1933). Rare.

Bionomics: Univoltine, summer, mountainous steppe species.

Flight period: June - July.

Host plants: The larvae feed on *Phlomis* spp. (Labiatae).

Masalia albida (Hampson, 1905)

Distribution pattern: Saharo-Sindian. North Africa, Arabian Peninsula, deserts of Iran. In the Levant recorded only from Jordan and Israel. In Israel: Only few specimens were collected in the northern part of the Arava Valley (Ne'ot Ha'Kikar and Shezaf Nature Reserve).

Bionomics: Univoltine, spring, deserticolous species.

Flight period: All specimens were collected in April.

Host plants: Unknown.

Discussion

Most of the Heliothinae (8/10) of Israel showed a clear habitat preference. From the ten species three are multivoltine. Two of them (*H. armigera* and *H. peltigera*) were abundant all over the country (in deserts they typically concentrate in oases); *H. nubigera* was only common in Semi-Arid areas and along the Coastal Plain. The other six species are univoltine, local and rare. Two of them (*H. incarnata* and *M. albida*) occurred only in the desert of the Dead Sea area, two (*P. treitschkei* and *A. phlebophora*) inhabited mountainous steppe, *H. viriplaca* occurred only on the grasslands of the northern part of the country, *S. scutosa* was recorded along the Coastal Plain and on sandy areas of the Western Negev. *P. delphinii* was restricted to the northern part of the Mediterranean zone in the Upper Galilee and on the Golan Heights, apparently this species was once wide spread in the north and not uncommon (personal communication S. Yathom) the last decades it became apparently rare and vanished in many locations.

Acknowledgement

We want to thank all our colleagues and the many generous Israeli citizens who helped with this survey. We are grateful to the Israeli Nature and Parks Authority (NPA), who supplied the collecting permits, especially to Dr. Rueven Ortal. We are also grateful to Prof. J. Kugler and Dr. A. Freidberg (University of Tel Aviv, Israel); to Prof. Y. Schlein (Hebrew University, Hadassah En Karem Medical School, Israel) who supplied laboratory space and equipment and to Prof. J. Fittkau and Dr. A. Hausmann (Bayrische Zoologische Staatssammlung, Munich Germany).

THE HELIOTHINAE OF ISRAEL

BIBLIOGRAPHY

- AMSEL, H. G., 1933.– Die Lepidopteren Palaestinas. Eine zoogeographisch-oekologisch-faunistische Studie.– *Zoogeographica*, **2**: 1-146.
- AMSEL, H. G., 1935a.– Neue palaestinensische Lepidopteren.– *Mitt. zool. Mus. Berl.*, **20**: 271-319.
- AMSEL, H. G., 1935b.– Weitere Mitteilungen ueber palaestinensische Lepidopteren.– *Veröff. dt. Kolon. Übersee-Mus. Bremen*, **1**: 223-277.
- ASHBEL, D., 1951.– *Bio-climatic atlas of Israel*: 151 pp. Meteorology Department of the Hebrew University. Jerusalem.
- AVIDOV, Z. & HARPAZ, I., 1969.– *Plant Pests of Israel*: 549 pp. Israel Universities Press. Jerusalem.
- BEAUMONT, P., BLAKE, G. H. & WAGSTAFF, J. M., 1976.– *The Middle East, a geographical study*: 572 pp. John Wiley & Sons, London.
- BIEL, E. R., 1944.– *Climatology of the Mediterranean area*: 184 pp. University of Chicago Press. Chicago.
- BODENHEIMER, F. S., 1930.– *Die Schaedlingsfauna Palaestinas*: 438 pp. Verlag Paul Parey, Berlin.
- FURTH, D. G., 1975.– Israel, a great biogeographic crossroad.– *Discovery*, **11**: 3-13.
- HACKER, H. H., 2001.– Fauna of the Nolidae and Noctuidae of the Levante with description and taxonomic notes.– *Esperiana*, **8**: 1-398.
- HACKER, H. H. & SCHREIER, H. P., 2001.– List of Noctuoidea (Lepidoptera) collected from 1987 to 1999 in Israel and Jordan.– *Esperiana*, **8**: 423 - 485.
- HACKER, H. H., KRAVCHENKO, V. & YAROM, I., 2001.– List of Noctuoidea (Lepidoptera) collected in Arava (Israel) with faunistical and ecological comments.– *Esperiana*, **9**: 515-534.
- HALPERIN, J. & SAUTER, W., 1991-1992.– An annotated list with new records of Lepidoptera associated with forest and ornamental trees and shrubs in Israel.– *Israel J. Ent.*, **25-26**: 105 - 147.
- KRAVCHENKO, V. D., 1984.– Behavior of the cotton bollworm (*Heliothis armigera*) in natural conditions.– *Zoologicheskyy Zhurnal*, **63**(5): 682-686 (in Russian).
- KRAVCHENKO, V. D., HACKER, H. H. & NEVO, E., 2001a.– “Evolution Canyon” model: Interslope differences in Noctuidae (Lepidoptera) of two canyons in Carmel and Galilee Mountains, Israel.– *Esperiana*, **9**: 451-458.
- KRAVCHENKO, V. D., HACKER, H. H. & NEVO, E., 2001b.– List of Noctuoidea (Lepidoptera) collected in Israel.– in 1959-1969.– *Israel J. agric. Res.*, **21**(2): 51-61.
- ZOHARY, M., 1962.– *Plant life of Palestine*: 262 pp. Ronal Press. New York.
- ZOHARY, M., 1966.– *Flora Palaestina Part I text*: 364 pp. The Israel Academy of Sciences and Humanities. Jerusalem.
- ZOHARY, M. & ORSHANSKY, G., 1949.– Structure and ecology of the vegetation in the Dead Sea region of Palestine.– *Palest. J. Bot.*, **4**: 177-206.

V. D. K.
Department of Zoology
The George S. Wise Faculty of Life Sciences
Tel Aviv University
Ramat Aviv 69978
ISRAEL / ISRAEL

M. F.
Molbechs Alle, 49
DK-4180 Sorø
DINAMARCA / DENMARK

J. M.
Seilerbruecklstrasse, 2
D-85354 Freising
ALEMANIA / GERMANY

O. B. O.
Department of Zoology
The George S. Wise Faculty of Life Sciences
Tel Aviv University
Ramat Aviv 69978
ISRAEL / ISRAEL

L. R.
Hungarian Natural History Museum
Baross utca, 13
H-1088 Budapest
HUNGRIA / HUNGARY

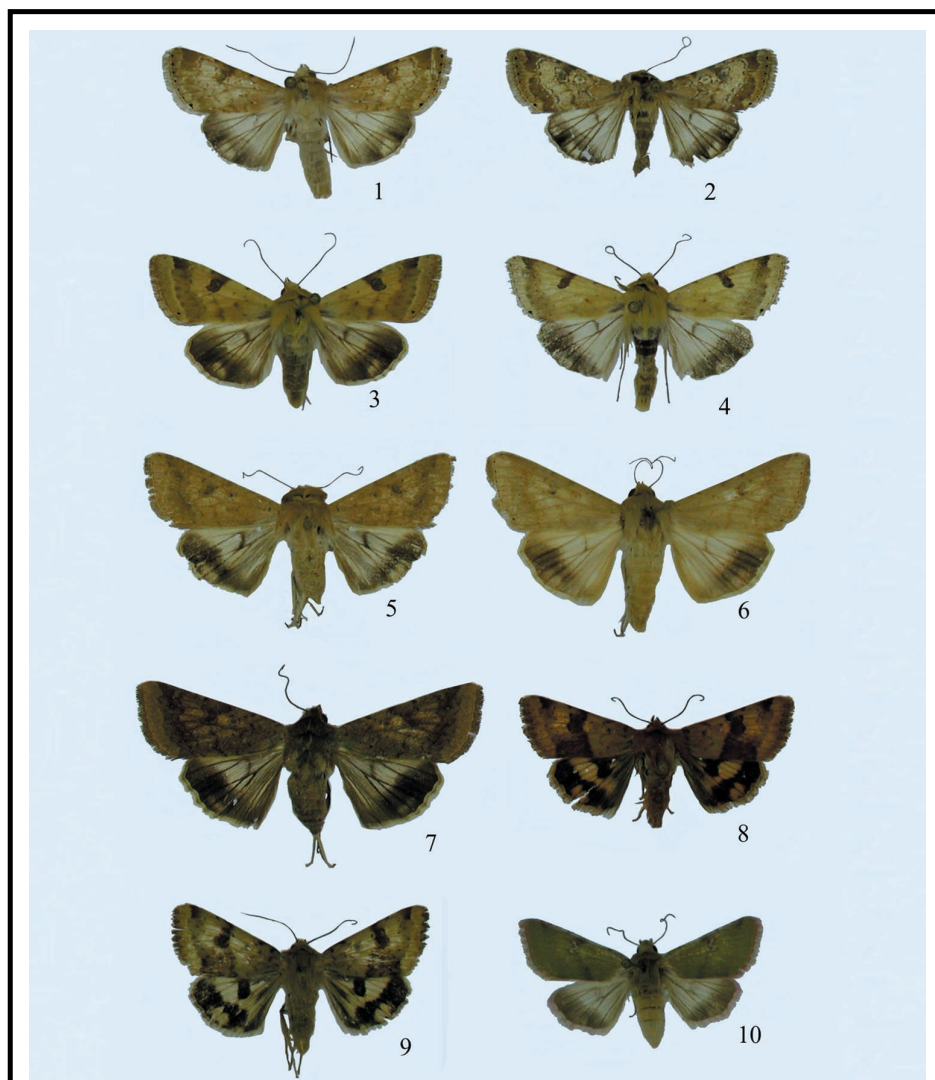
C. L.
Department of Parasitology
Kuvín Centre for the Study of Infectious and
Tropical Diseases
The Hebrew University - Hadassah-Medical School
Jerusalem
ISRAEL / ISRAEL

V. D. KRAVCHENKO, O. B. ORLOVA, M. FIBIGER, L. RONKAY, J. MOOSER, C. LI & G. C. MULLER

G. C. M.
Department of Parasitology
Kuvín Centre for the Study of Infectious and Tropical Diseases
The Hebrew University - Hadassah-Medical School
Jerusalem
ISRAEL / *ISRAEL*

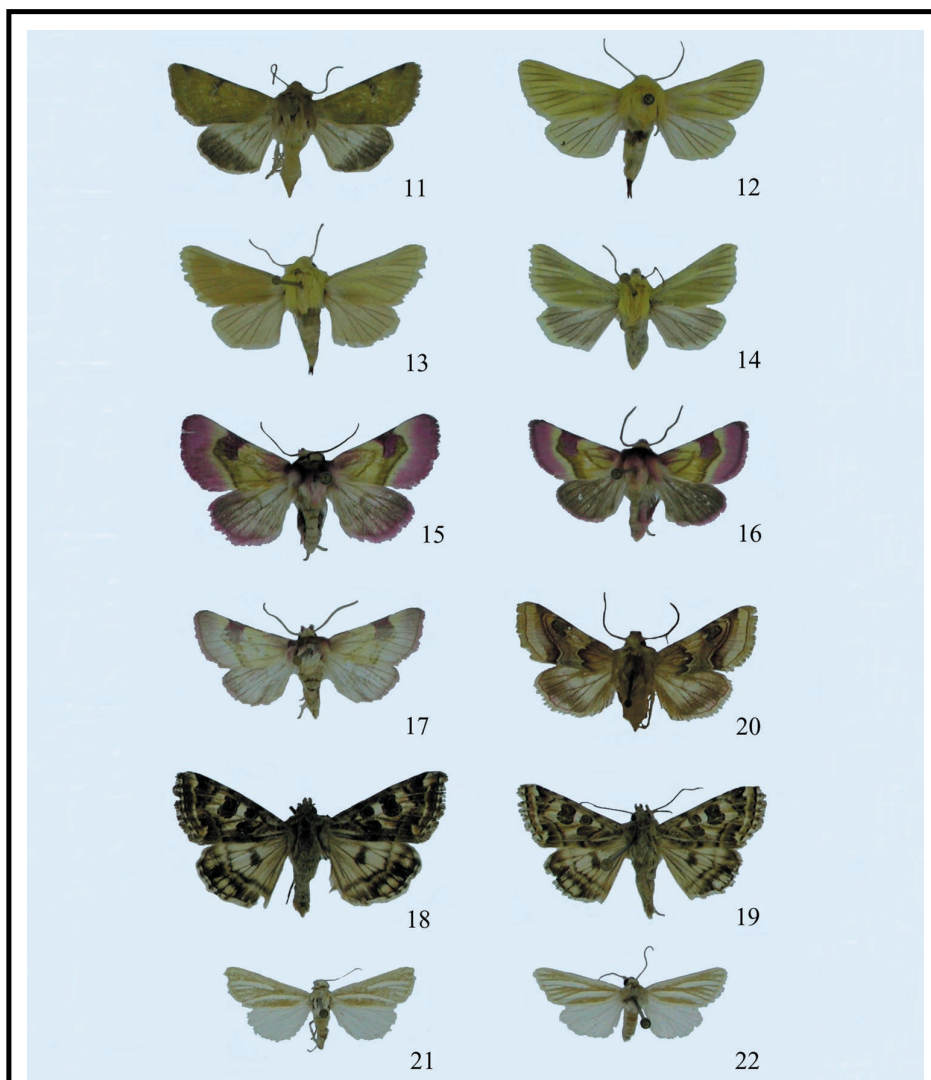
(Recibido para publicación / *Received for publication* 23-V-2005)
(Revisado y aceptado / *Revised and accepted* 20-VI-2005)

THE HELIOTHINAE OF ISRAEL



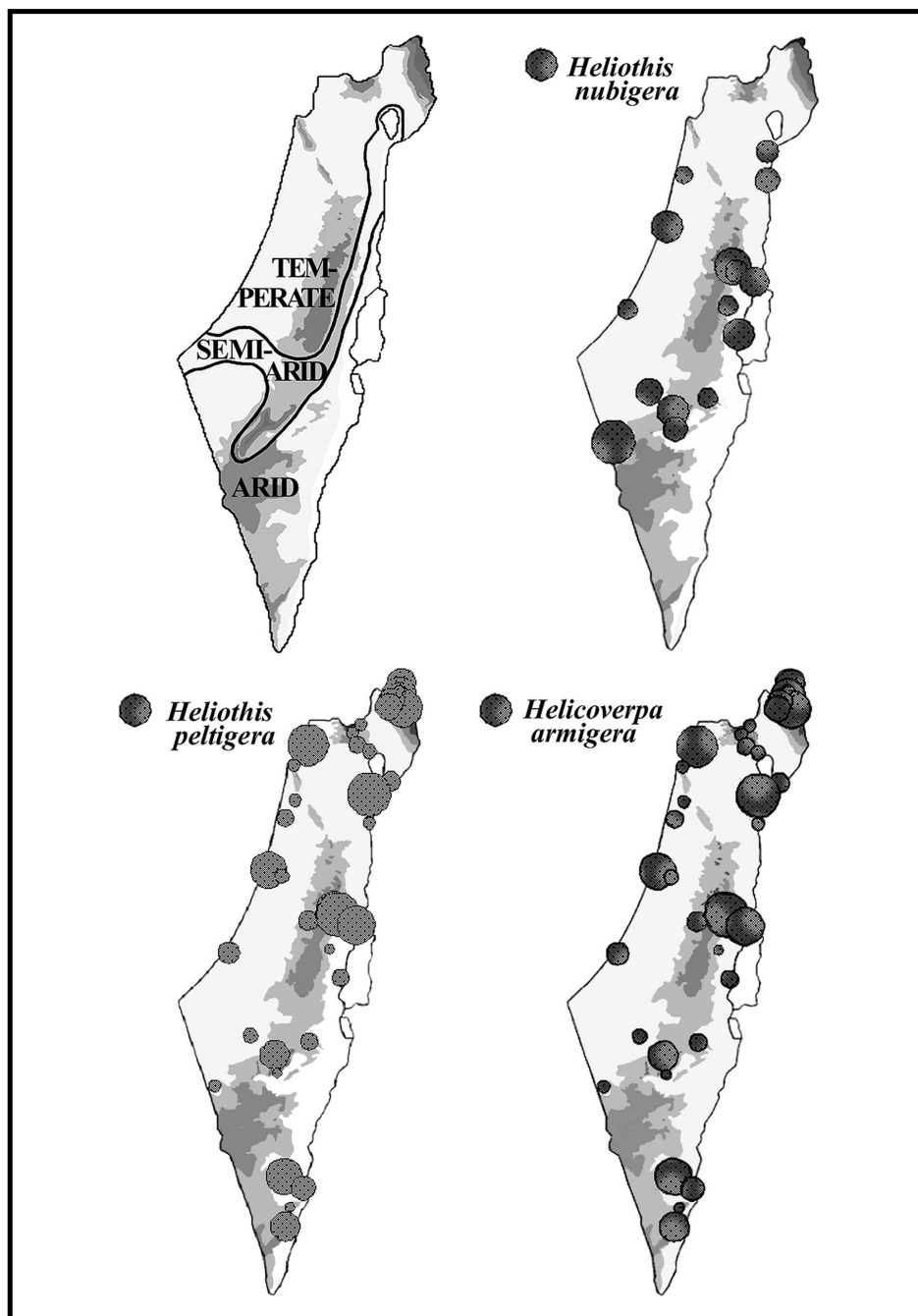
Figs. 1-10.—1. *Heliothis nubigera* Israel. Arava Valley, Iddan. 19-X-1998. V. Kravchenko & I. Yarom leg. 2. *Heliothis nubigera*, Israel. Arava Valley, Iddan. 19-X-1998. V. Kravchenko & I. Yarom leg. 3. *Heliothis peltigera*, Israel. Arava Valley, Hazeva Field School. 19-II-1998. V. Kravchenko & I. Yarom leg. 4. *Heliothis peltigera*, Israel. Arava Valley, Hazeva Field School. 17-X-1998. V. Kravchenko & I. Yarom leg. 5. *Helicoverpa armigera* Israel. Arava Valley, 'En Zin. 18-XI-1998. V. Kravchenko & I. Yarom leg. 6. *Helicoverpa armigera* Israel. Arava Valley, Hazeva Field School. 17-II-1998. V. Kravchenko & I. Yarom leg. 7. *Helicoverpa armigera*, Israel. Carmel Ridge, Nahal Oren. 2-XI-200. V. Kravchenko leg. 8. *Heliothis virescens*, Israel. Mt Hermon, 1500 m. 25-27-V-2001. V. Kravchenko. 9. *Heliothis virescens*, Israel. Mt Hermon, 2000 m. VI-2003. V. Kravchenko leg. 10. *Heliothis virescens*, Israel. Hazeva Field School. 12-IV-1999. V. Kravchenko & I. Yarom leg.

V. D. KRAVCHENKO, O. B. ORLOVA, M. FIBIGER, L. RONKAY, J. MOOSER, C. LI & G. C. MULLER



Figs. 11-22.— **11.** *Heliothis incarnata* Israel. Arava Valley, En Zin. 4.V.2002. V. Kravchenko leg. **12.** *Aedophron phlebotomus*, Israel. Mt Hermon, 1900 m. 24-VI-2000. V. Kravchenko leg. **13.** *Aedophron phlebotomus*, Israel. Mt Hermon, 2000 m. 25-VII-2001. V. Kravchenko leg. **14.** *Aedophron phlebotomus*, Israel. Mt Hermon., 2000 m. VII-2002. V. Kravchenko leg. **15.** *Pyrrhia treitschkei*, Israel. Judean Mts., Zur Hadassa. V-2001. V. Kravchenko leg. **16.** *Pyrrhia treitschkei* Israel. Golan Heights, Majdal Shams. V-2001. V. Kravchenko leg. **17.** *Pyrrhia treitschkei* Israel. Judean Mts., Zur Hadassa. V-2001. V. Kravchenko leg. **18.** *Schinia scutosa* Israel. Southern Coastal Plain, Nizzanim Nature Reserve. II-2002. V. Kravchenko leg. **19.** *Schinia scutosa* Israel. Southern Coastal Plain, Nizzanim Nature Reserve. 20-III-2003. V. Kravchenko leg. **20.** *Periphanes delphinii* Israel. Upper Galilee, Elon. 18-V-1946. Bytinski-Salz leg. **21.** *Masalia albida* Israel. Dead Sea area, Ne'ot Ha'Kikar. 20-IV-1998. V. Kravchenko & I. Yarom. **22.** *Masalia albida* Israel. Arava Valley, Shezaf Nature Reserve. 14-IV-1999. V. Kravchenko & I. Yarom leg.

THE HELIOTHINAE OF ISRAEL



V. D. KRAVCHENKO, O. B. ORLOVA, M. FIBIGER, L. RONKAY, J. MOOSER, C. LI & G. C. MULLER

