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The Mantodea of Israel and adjacent areas (Insecta: Dictyoptera)

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ABSTRACT

The present study provides a faunistic and taxonomic account of 33 mantid species belonging to 20 genera and 10 families found in Israel and adjacent areas. Five species—*Empusa guttula* (Thunberg), *Eremiaphila bovei* Lefebvre, *Iris caeca* Uvarov, *Iris deserti* Uvarov and *Severinia lemoroi* (Finot)—are reported for the first time in Israel. The results are mainly based on field work all over Israel (2014–2024) and examination of entomological collections, in particular the Steinhardt Museum of Natural History collection (including the historical collection of Prof. J. Wahrman) containing about 2400 specimens. An annotated list of all mantid species present in Israel and the adjacent areas is provided, along with an illustrated key. Systematic, distributional (worldwide and local, including maps), biological and ecological notes are given for each genus and species. Biogeographical and regional occurrence analyses are presented along with conservation issues and citizen-science contributions. Recommendations for further Mantodea research in Israel are discussed.

KEYWORDS: Biodiversity, faunistics, Mantodea, praying mantises, taxonomy, Israel, Levant, Middle East, biogeography, citizen science, identification key, nature conservation.

תקציר

עבודה זו מהווה, לראשונה, סיכום פאוניסטי וטקסונומי מקיף של סדרת גמלי־שלמה (Mantodea) בישראל ובאזורים הקרובים, וכוללת 33 מינים של גמלי־שלמה המשתייכים ל־20 סוגים ועשר משפחות. מבין 33 המינים חמישה: עין־קשת סהרי *Iris deserti*, עין־קשת עברונה *Iris caeca*, מדברן פעוט *Eremiaphila bovei*, ענפן מלחות *Severinia lemoroi* וסוסת־שד מדברית *Empusa guttula* מדווחים לראשונה מישראל. ממצאי העבודה מסתמכים בעיקר על עבודת שדה בכל חלקי הארץ בשנים 2014–2024, וכן על בדיקת אוספים קיימים של גמלי־שלמה שהגדול ביניהם נמצא במוזיאון הטבע ע"ש שטיינהרדט באוניברסיטת תל-אביב (כולל האוסף ההיסטורי של פרופ' יעקב ורמן) ומכיל כ־2400 פרטים. מידע רב נאסף ועובד לראשונה, במסגרת מדע אזרחי מרשתות חברתיות ויתר מקורות דיגיטליים. לרשימת מיני גמלי־השלמה הידועים מישראל והאזורים הסמוכים מצורף מפתח מינים מאוייר. העבודה כוללת סקירה היסטורית על מחקר גמלי־השלמה באזור, מידע סיסטמתי ואקולוגי על כל הסוגים והמינים, תמונות כל המינים, תפוצה עולמית ומקומית בצירוף מפות וסקירה ביוגאוגרפית. פרקים נוספים עוסקים בהיבטים של שמירת טבע, תרומת המדע האזרחי למחקר המדעי והמלצות למחקר עתידי על גמלי־שלמה בישראל.

מילות מפתח: מגוון ביולוגי, פאוניסטיקה, סדרת גמלי-שלמה, טקסונומיה, ישראל, לבנט, המזרח התיכון, מפתחות להגדרה, ביוגאוגרפיה, מדע אזרחי, שמירת טבע.

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INTRODUCTION

Mantodea, commonly known as mantids or mantises, is an order of paurometabolous, predatory, terrestrial insects. The order encompasses over 2540 species in about 460 genera and 32 families (Otte *et al.* 2023). Mantids live in a broad variety of terrestrial habitats, except for permanently cold and aquatic environments. Their adaptation to these differing structural and climatic conditions has led to a fascinating morphological diversity (Wieland & Svenson 2018).

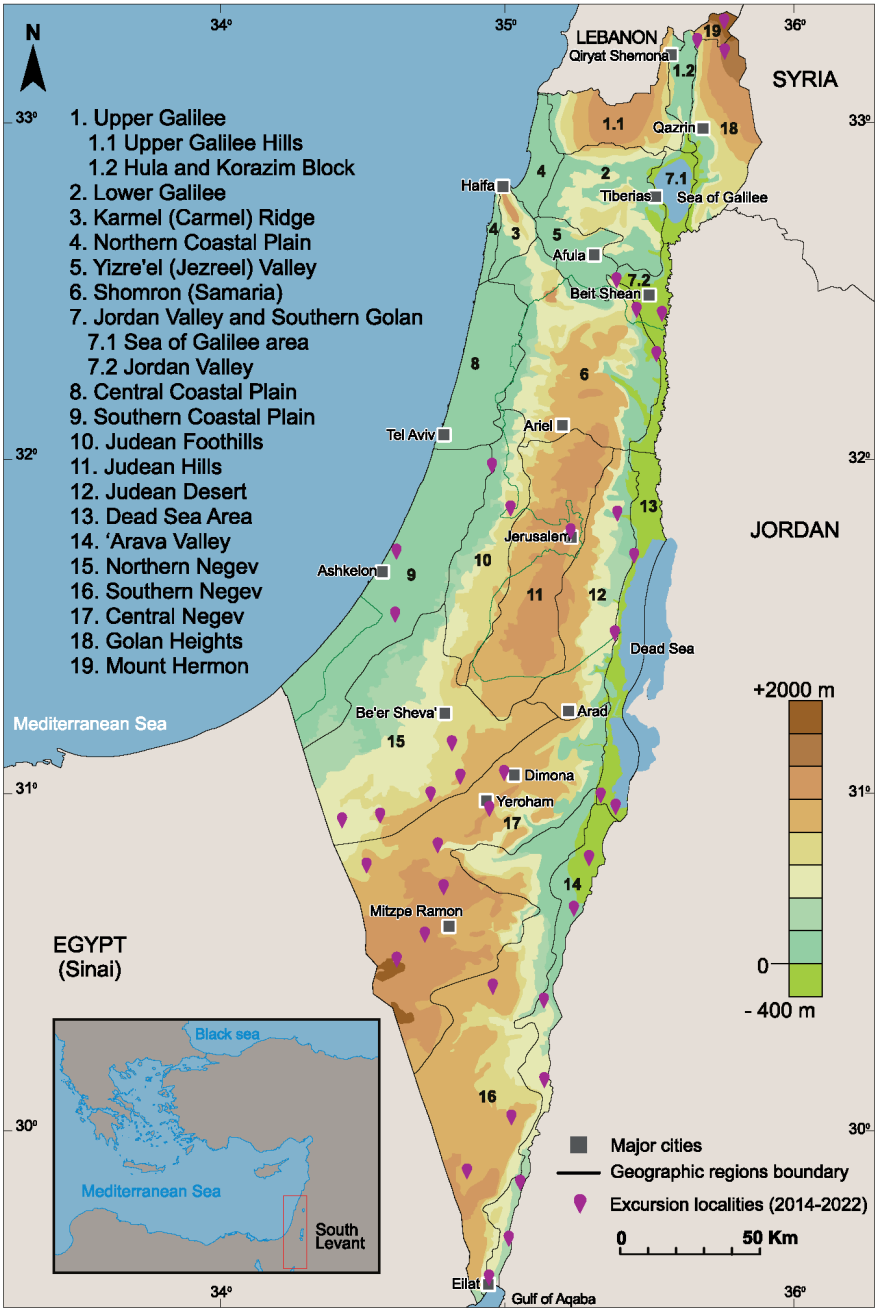
Mantids are mostly visual predators, primarily preying on live arthropods, particularly other insects and conspecifics of similar size. Their combination of stereoscopic and acute vision (Karl 1999), along with lightning-fast specialized raptorial forelegs (Prete & Hamilton 1999; Ehrmann 2002), makes them highly efficient and aggressive hunters. Although their typical foraging strategy is that of sit-and-wait, some species can switch between ambushing and actively searching on plants and/or on the ground (Inoue & Matsura 1983; Ramsay 1990; Hurd 1999; Ehrmann 2002). Larger mantids, especially gravid females, may occasionally attack and devour small vertebrates such as amphibians, reptiles, birds, mammals and even small fish (Ramsay 1990; Prete 1999; Ehrmann 2002; Nyffeler *et al.* 2017; Battiston *et al.* 2018).

Mantids often display sexual dimorphism, with females usually being larger than males. The female attracts the male with pheromones (Maxwell 1999; Prete 1999; Hurd *et al.* 2004). She lays eggs in a protective case called an ootheca, which can be attached to or deposited on various substrates (e.g., tree branch or bark, under a stone, on a rock, in the soil, or even on man-made objects), depending on the species.

Mantids show diverse defense adaptations and behaviors. Their general coloration tends to be cryptic, mostly reflecting the environment in which they live (Ramsay 1990; Brackenbury 1999; Roy 1999). Mantids are well-known for performing visually impressive deimatic (startle) displays (Figs 21B, 22B, D, 24C, 29B, D, 30B$_1$, D, 33D, 34C, 36D, 37C, 45C, 51C), intended to frighten predators combining the movement of different parts of the body: raising the thorax, spreading the forelegs to each side of the head and raising the wings (Bragg 1997); and some of these displays may include a variety of sounds (Hill 2007; Vidal-García *et al.* 2020).

The majority of extant Mantodea (Cernomantodea) possess a metathoracic hearing organ, or "cyclopean ear" (Ma *et al.* 2023) that allows them to locate bats in flight and escape attack by suddenly diving straight to the ground (Yager 1999). The natural enemies of mantids include certain specialized predators: endoparasitic nematodes (Chordodidae) (Schmidt-Rhaesa & Ehrmann 2001); members of the genus *Tachysphex* (Crabronidae) that, among others, hunt mantid nymphs as nutrients for their larvae (Straka & Schmid-Egger 2017); and parasitoid wasps (Eupelmidae and Torymidae) that attack mantid eggs in the ootheca (Mirzaee *et al.* 2022).

Israel is situated in the northern part of the Great Rift Valley within the eastern Mediterranean Basin, at the crossroads of three continents and two oceans and



Map 1. Biogeographical zonation of Israel.

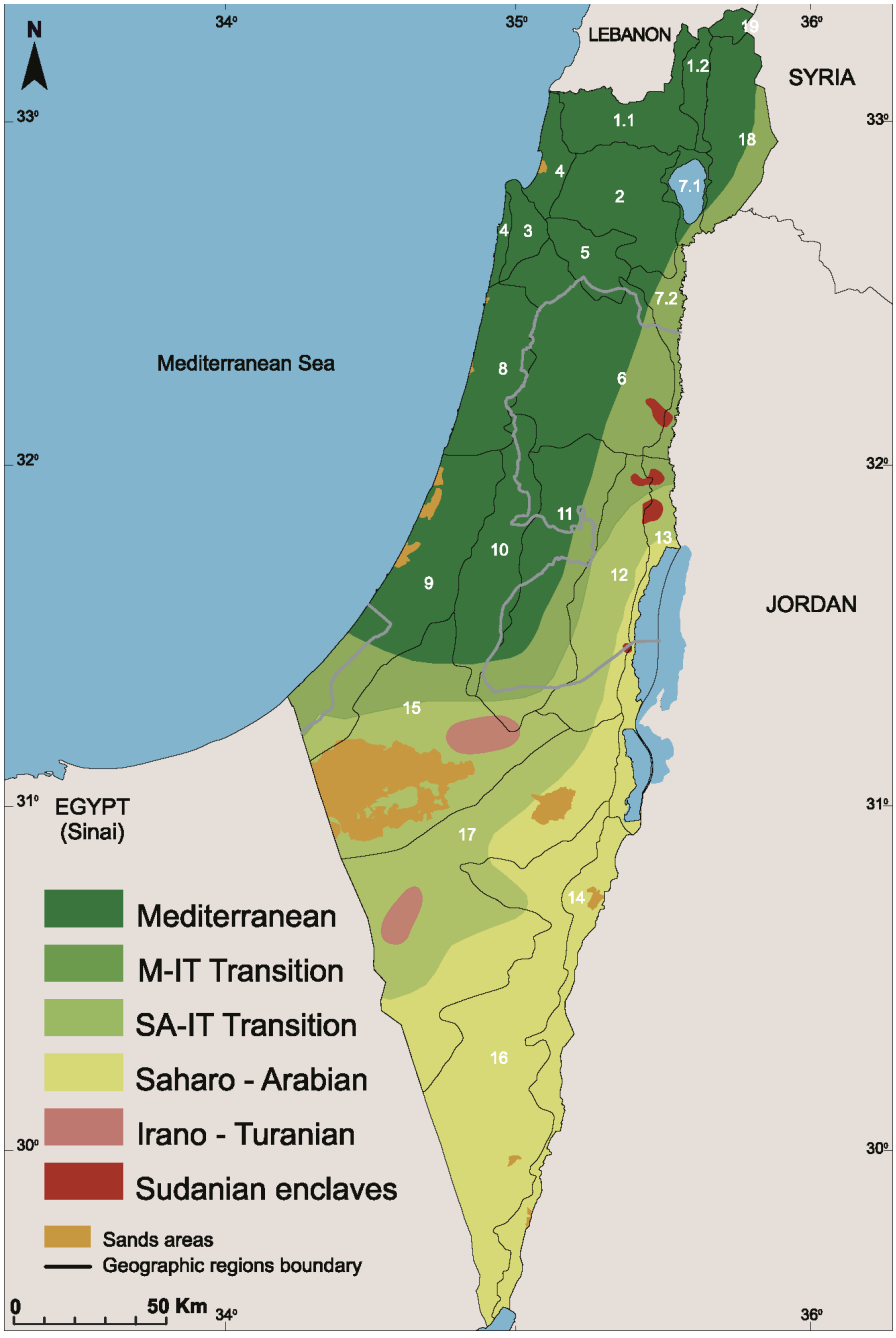
on the border between the desert and cultivated land (Map 1). The study area is highly diverse geologically, topographically and climatically. The country has a predominantly hilly topography and a warm climate characterized by a sharp seasonal division between a rainy winter and a dry summer. Only a few hundred kilometers separate the slope of Mount Hermon (alt. 2,236 m: local peak) in the north, from the arid areas in the southern Negev presenting diverse habitats. Mt Hermon is characterized by low temperatures and snow coverage in the winter and a hot dry summer. In the east, along the hot Rift Valley (Map 1, regions: 18, 7.1, 7.2, 13, 14), subtropical influences occur, with pockets of Sudanian elements of fauna and flora (Map 2). The north and center of the country have a Mediterranean climate, receiving an annual average precipitation of 350 mm or more. In the east and south, the Irano-Turanian zone (a dry steppe) interweaves with the Saharo-Arabian (true desert) (Map 2). The Saharo-Arabian (eremic zone) occupies parts of the south, with less than 200 mm of winter rainfall. A long history of human activity of cultivation along with the grazing by domestic animals has had a strong impact, including changes in the natural habitats that have resulted in a mosaic of habitat patches. The consequence of these diverse geographical and climatic regions, together with human influences, is a rich fauna and flora of different origins. Many animal and plant species found in Israel are found at the edge of their geographic distribution (Bodenheimer 1933*b*, 1935*b*; Orni & Efrat 1971; Furth 1975; Danin & Plitmann 1987; Kugler 1988; Danin 1992; Müller *et al.* 2005; Kravchenko *et al.* 2006; Ben-Moshe & Renan 2022).

Mantids are well represented in the landscape of Israel and can be found from the top of the Mt Hermon ridge and the Upper Galilee hills, throughout most of the urban, rural and agricultural landscapes of the center of the country, as well as in the most arid habitats in the east and south. However, despite their widespread presence, the local mantodean fauna has received relatively little taxonomic and ecological attention to date and is therefore considered poorly studied in Israel.

In the last decades, several studies have been conducted on Mantodea in the Levant and adjacent areas. In addition to the taxonomic and ecological contributions, the studies listed below contributed to the assessment of which species are widespread in the Levant and to an estimation of possibilities and locations of 'hidden' species that may not have been found in Israel to date. Among the important studies we note Kaltenbach (1982, 1984, 1991), Abu-Dannoun (2006), Mohammad *et al.* (2011), Caesar (2015), Enan *et al.* (2017), Handal *et al.* (2019).

The aims of the present study are: (1) to acquire up-to-date knowledge of Israeli Mantodea fauna based on existing collections and by reviewing published data; (2) to enrich the national insect collection; (3) to reassess the taxonomic status of mantid genera and species through the literature and various collections; and (4) to prepare an up-to-date identification key to all known local species.

The present study summarizes nine years (2014–2024) of research based on the National Collection of Insects at the Steinhardt Museum of Natural History, Tel



Map 2. Biogeographical and phytogeographical regions of Israel.

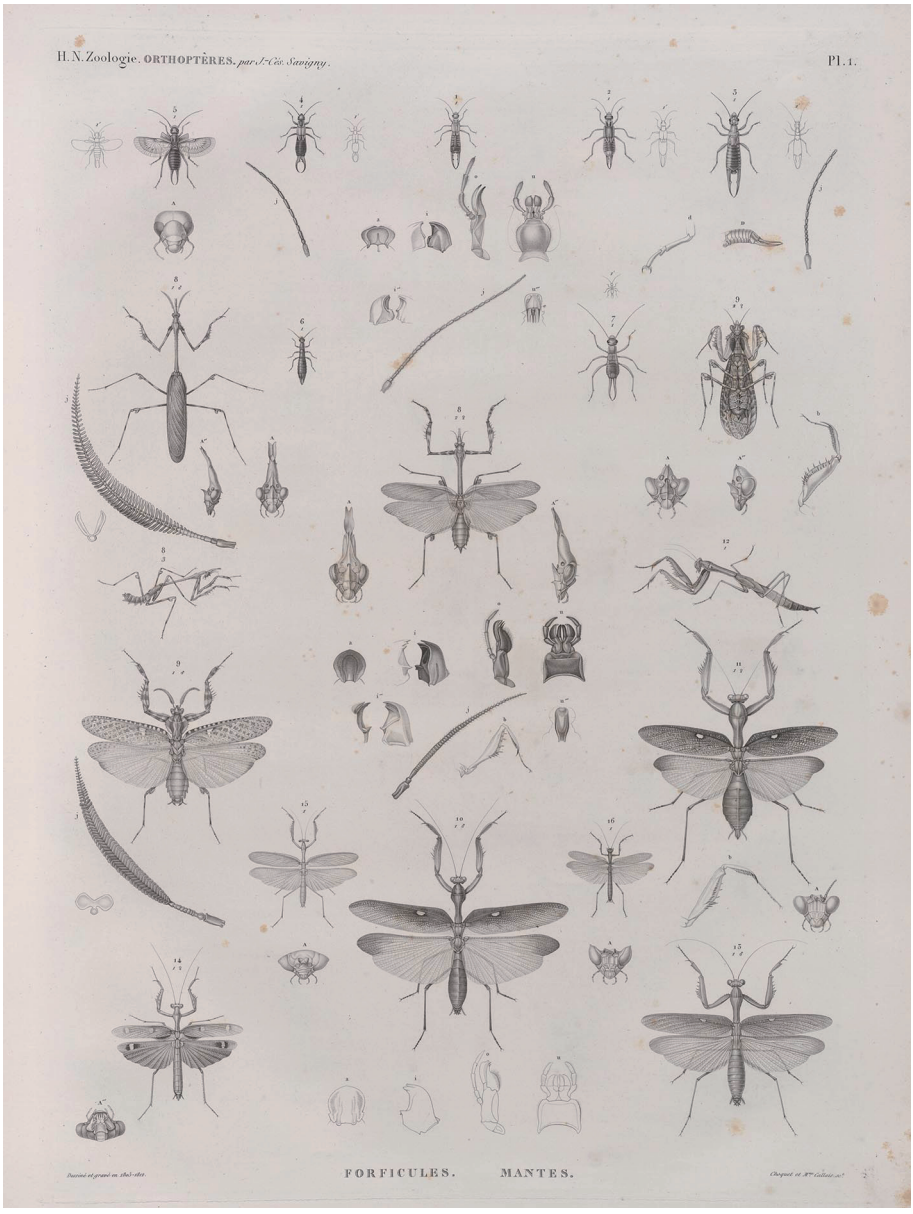


Fig. 1. J.C. Savigny's folio Pl. 1 in the *Description de l'Égypte* (Audouin 1825; Rare Book Division, The New York Public Library 1809).

Aviv University (SMNHTAU), fieldwork, literature and various other sources. In this study, we provide an updated species checklist, a historical overview of mantid research in Israel, an identification key and preliminary data on distribution (represented by locality records), seasonal occurrence and ecological notes. Although ecological aspects were not originally part of the research objectives, valuable ecological data were obtained and some of these data are presented here.

MANTODEA RESEARCH IN ISRAEL – A BRIEF HISTORICAL REVIEW

The early studies of Mantodea in the areas of modern-day Israel and adjacent countries constituted part of the general scientific interest in Polyneoptera (often listed under the Orthoptera group as used in old taxonomy) of the Levant. Travelers and researchers, not necessarily entomologists or zoologists, collected material that they gave to experts and natural history museums in Europe. Due to the nature of the early studies of Mantodea of the Levant (19th– early 20th century) mistakes were often made in regard to locality records and species identification and these mistakes were further cited in later studies. The following historical review is based mainly on the reviews by Buxton and Uvarov (1923); Uvarov (1924) and Bodenheimer (1925, 1935*b*, 1935*c*).

1798–1801 – The French scholar J.C. Savigny, who accompanied Napoleon on his campaigns in Egypt and Palestine, was the first to amass large collections of the local insects (deposited in the Paris Museum of Natural History). Savigny prepared illustrated folios, but was not able to complete his work and to write the text as a result of numerous health problems, including losing his sight, therefore the locality records of the specimens remained unknown; his work was completed by J.V. Audouin (Sherborn 1897; Tollit 1986). After the decision of the ICZN (1987), the authorship of this part of the 'Description de l'Egypte' has been attributed to Audouin, not to Savigny. The two folios: Pl.1 - Forficules, Mantes (Fig. 1) (Rare Book Division, The New York Public Library 1809*a*) and Pl.2 - Mantes, Blattes (Rare Book Division, The New York Public Library 1809*b*), prepared by Savigny, which were included in Audouin (1826) show 12–13 species of Mantodea. Some species are restricted to Egypt, while others are common to both Israel and Egypt and a few are unknown from Egypt. Saussure (1871) referred to these folios of the illustrated species in his book *Mélanges Orthoptérologiques*.

1869–1871 – Materials from Palestine found their way into the collections of H.L.F. de Saussure and C. Brunner von Wattenwyl. Saussure (1871) recorded a large mantid from Jaffa, under the name *Fischeria armata* (De Haan, 1842), which was later assigned by Uvarov (1924) to the genus *Eremoplana* Stål, 1871 and received a new species name *Eremoplana infelix* Uvarov, 1924.

1890 – The French zoologist T. Barrois traveled in the Levant (recent Israel, Lebanon and Syria) on March–June, and brought back 23 Orthopteran species, as determined by J. Bolívar (1893). Of these, there were five species of Mantodea.

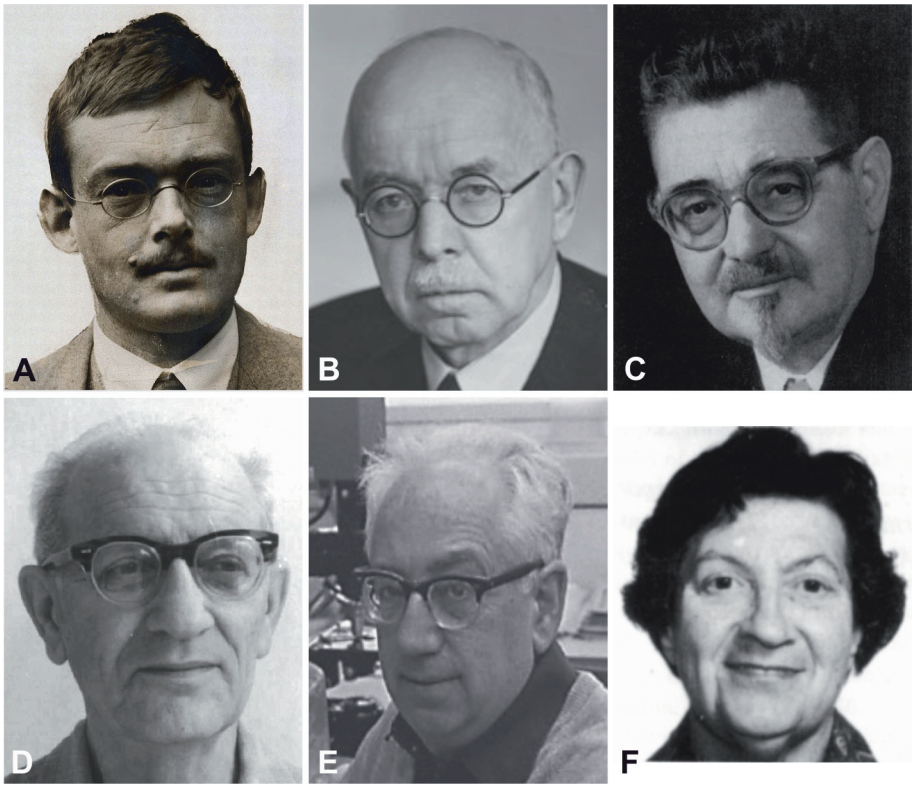


Fig. 2. Zoologists who have provided a significant contribution to the study of the Mantodea fauna of Israel: (A) P.A. Buxton, courtesy Wellcome Collection (2024); (B) B.P. Uvarov; (C) F.S. Bodenheimer; (D) Y. Palmoni; (E) J. Wahrman; (F) S.A. Blondheim.

1893 – The Italian ornithologist E. Festa collected Orthopteran specimens (including about ten mantid species) during his visit in Palestine (recent Israel and Jordan) from March to August. The species were determined by E. Giglio-Tos and A. Griffini. The main collecting areas were the Jordan Valley, Transjordan and the Upper Galilee Hills.

1893–1896 – Thirty Orthopteran species (Blattodea, Mantodea and Orthoptera) were collected by the English Rev. A.H. Swinton near and in Jerusalem. Of these, there were three to four specimens of Mantodea (Swinton 1889).

1893, **1915** – E. Giglio-Tos examined and identified specimens collected during Festa's journey in Palestine and the adjacent countries (Fig. 1). Some of these specimens were incorrectly identified. According to Buxton and Uvarov (1923), *Empusa pennicornis* Pallas, 1773 probably refers to *Empusa hedenborgii* Stål, 1877; and *Ameles spallanzania* Rossi, 1792 (from Jerash in Jordan) was an incorrect identification of a single nymph. Giglio-Tos' identification of *Bolivaria*

brachyptera Pallas, 1773 was later cited by Bodenheimer (1925) and other studies. Giglio-Tos's collection is deposited in the Turin Museum of Natural History (MRSN). Photos of the Festa material collected in Palestine and sent from the MRSN (April 2022), show no *Bolivaria brachyptera* in any of the images.

1904 – During a short trip from May to June, the German botanist A. Kneucker collected 22 species of Orthoptera, including a few mantids, of which three were reviewed by Krauss (1909).

1905 – F. Werner described *Eremiaphila brunneri* Werner, 1905 from a specimen from the vicinity of Jerusalem and *Eremiaphila dawydowi* Werner, 1905 from a specimen from the Dead Sea area.

1921–1924 – P.A. Buxton (Fig. 2A), in then Mandatory Palestine as a British medical entomologist, collected Orthoptera (including Mantodea) from across the country, but no further south than the Dead Sea area. based on material, collocated by him and O. Theodor in 1921–1923, he published with Uvarov a species list that includes nine mantodean species. They summarized all Orthopteran species and the literature at the time pertaining to Palestine and the adjacent countries (Buxton & Uvarov 1923)

1923–1939 – B.P. Uvarov (Fig. 2B), an entomologist at the Imperial Institute of Entomology in London, made significant contributions to the knowledge of the local Orthoptera fauna. He published numerous papers related to the Orthoptera fauna of Palestine and the adjacent countries and collaborated with local scholars (Buxton & Uvarov 1923; Uvarov 1924, 1929, 1930, 1931, 1933, 1939*a*, *b*).

1923–1937 – F.S. Bodenheimer (Fig. 2C) made major contributions to the early knowledge of Mantodea of Israel. Among his hundreds of publications, five were at least partly dedicated to Mantodea of Palestine (Bodenheimer 1925, 1933*a*, 1935*a*, *b*, *c*). Based on those, on earlier publications (e.g. Saussure 1871; Bolívar 1893; Giglio-Tos 1893; Werner 1905; Buxton & Uvarov 1923; Uvarov 1924) and upon his own collection, a list of 21 Mantodea species (Fig. 3) was published in his *Prodromus Faunae Palestinae* (Bodenheimer 1937), the major contribution to the early knowledge of the Israeli fauna. Of these, 14 have been confirmed as still found in the recent Israel. Bodenheimer's records refer to the Mandatory Palestine territories that today encompass Israel and the adjacent areas including Jordan. Part of his insect collection, including mantids, is now held in the SMNHTAU collections. Bodenheimer was not an expert on Mantodea and his lists raise questions about some of the records he cited. These issues are discussed below or in the notes to the relevant species.

1927–1969 – Y. Palmoni (Fig. 2D) was an amateur naturalist and a teacher. For almost 40 years he devoted himself to the study of the nature of the surroundings of the Lake Kinneret (Lake Tiberias, Sea of Galilee) and the adjacent parts of the Jordan Valley in general and especially its entomofauna. Palmoni recorded many species of insects in Israel, some of them new to science and several of them named after him, such as *Pareuthyphlebs palmonii* (Uvarov, 1939*b*) (Lulav 1972). His collection includes 12 species of Mantodea (deposited at the SMNHTAU).

1949–1970 – J. Wahrman (Fig. 2E) was a professor of biology at the Hebrew University of Jerusalem, he specialized in the genetics and received his PhD in the genetics of mantids (Richler 2006). Wahrman created an important collection of animals and plants of Israel with an emphasis on insects. His insect collection is currently deposited at the SMNHTAU and holds hundreds of Mantodea specimens (including the holotype (male) and the allotype (female) of *Holaptilon pusillulum* Beier, 1964). The Wahrman collection is a treasure house of important historical records of species. Some of these species were from the Jerusalem area and are currently extinct locally due to urbanization and landscape development.
1951 – W. Ramme described a new species of *Empusa* from Israel, *Empusa longicollis* Ramme, 1951. The validity of this species remains controversial and is discussed under the genus account.
1964 – M. Beier described a new genus and a new species from Israel, *Holaptilon pusillulum* Beier, 1964, from J. Wahrman's collection (now deposited in SMNHTAU).
1960s–1980s – S.A. Blondheim of the Hebrew University of Jerusalem (HUJI) (Fig. 2F) (Greenfield & Pener 1989) showed great interest in mantids and in collecting

	Giglio-Tos 1893	Bodn. 1925	Bodn. 1935b	Bodn. 1937	Battiston 2010	Status	Comments
Rivetina baetica	★	★	★	★	★	Confirmed	See species notes
Microthespis dmitriewi			★	★	★	Confirmed	
Eremoplana infelix		★	★	★	★	Confirmed	
Ameles heldreichi	★	★	★	★	★	Confirmed	
Ameles sp.			★	★			Refers to *A. kervillei* from Jerash, Jordan
Ameles aegyptiaca				★		No evidence	See genus notes
Iris oratoria		★	★	★	★	Confirmed	
Eremiaphila brunneri		★	★	★	★	Confirmed	Senior synonym of *E. sacra*
Eremiaphila dawydowi		★	★	★	★	Confirmed	Junior synonym of *E. arabica*
Eremiaphila ammonita			★	★		No evidence	Bodenheimer (1933*a*), known only from Jordan. Misidentified by Uvarov (1939).
Eremiaphila uvarovi			★	★		No evidence	Bodenheimer (1933*a*), known only from Jordan.
Eremiaphila genei	★	★	★	★		Confirmed	See species notes
Geomantis larvoides			★	★		No evidence	Wrong identification
Bolivaria brachyptera	★	★	★	★		No evidence	Wrong identification
Blepharopsis mendica	★	★	★	★	★	Confirmed	
Empusa fasciata	★	★	★	★	★	Confirmed	See genus notes
Empusa hedenborgii		★	★	★		Confirmed	
Empusa uvarovi			★	★	★	No evidence	See genus notes
Hypsicorypha gracilis			★	★		Confirmed	
Mantis religiosa	★	★	★	★	★	Confirmed	
Sphodromantis viridis	★	★	★	★	★	Confirmed	Recorded by Giglio-Tos under incorrect name *Sphodromantis biocula* (Buxton & Uvarov 1923)

★ present

Fig. 3. Historical reports of local species versus Battiston *et al.* (2010). The brown highlighted lines show species that were recorded from Israel in the past, but later revealed to be mistaken identifications.

data and specimens, which are currently deposited in the SMNHTAU. Blondheim was the author of the Mantodea entry in the third volume of the *Plants and Animals of the Land of Israel: An Illustrated Encyclopedia* (Blondheim 1989), in which she stated that over 20 species were known from Israel.

1990–1993 – Daniel Rauscher carried out an in-depth review and summarized his three-year work in his unpublished high school thesis, based on his observations and the SMNHTAU and HUJI Mantodea collections, under the supervision of D. Simon and with the help of A. Kaltenbach (identification and counseling). Rauscher listed ~30 species; 26 of which (some as synonyms) are confirmed in the current study. Rauscher added seven new species records for Israel, which are confirmed herein: *Perlamantis alliberti* Guérin-Méneville, 1843, *Ameles kervillei* Bolívar, 1911, *Eremiaphila braueri* Krauss, 1902, *Heterochaeta pantherina* (Saussure, 1872), *Sinaiella nebulosa* Uvarov, 1924, *Severinia popovi* (Kaltenbach, 1982), *Miomantis paykullii* Stål, 1871.

2010 – Battiston *et al.* (2010) noted 18 species from Israel in the *Mantids of the Euro-Mediterranean area*. Of these, *Bolivaria brachyptera* and *Empusa uvarovi* Chopard, 1921 have not been confirmed during our study, neither in the examined collections nor during our fieldwork.

2025 – Stiewe *et al*. (2025) described an endemic new genus and new species from Israel, based on four specimens deposited in the SMNHTAU.

F.S. Bodenheimer, one of the pioneers of the Israeli entomology, greatly inhanced the knowledge on the Israeli mantid fauna and strongly influenced its further development, therefore his research should be mentioned separately.

Bodenheimer (1925) published in Hebrew an introductory review of the 'Orthoptera of the Land of Israel' that listed Mantodea and Blattodea. This was a preliminary list for later editions of his checklists (Bodenheimer 1935*a*, *b*, 1937). Bodenheimer (1935*b*), published additional collecting data and Mantodea ecology notes (in German), together with seasonal occurrence. Of Bodenheimer's lists (Fig. 3), two species are considered identification errors. His records and references (Bodenheimer 1925, 1935*b*) have enabled the current authors to trace the history of Bodenheimer's lists and clarify some of the ambiguities behind the records.

Bodenheimer (1925) listed three records of *Bolivaria brachyptera*: Haifa (leg. Festa), Rehovot (leg. Aharoni) and Hartuv in the Judean Hills (leg. Bodenheimer). However, Bodenheimer (1935*b*) withdrew these records, considering them as misidentifications of *Ameles heldreichi*, and referred to the specimens mentioned by Giglio-Tos (1893): a female from the Yeriho (Jericho) vicinity (leg. Festa), as well as specimens from Jamuneh (Yammoune), Mt Sannine and Ferzol in Lebanon. Bodenheimer (1935*b*) wrote: "The species has not yet been found again and confirmation is urgently needed. Since the species is extremely common not only in southern Russia and the Caucasus but also, according to Werner (1915), in the entire steppes of East Asia up to the Cilician Taurus (Turkey) and occurs in Persia (Qazvin), the occurrence of the species in Palestina is by no means

improbable". It is unclear whether Bodenheimer (during that period) had seen a *Bolivaria* specimen – as both male and female of this brachypterous species are much larger (40–50 mm) than any similar-looking species (females) in the Levant; (*Ameles* spp., 20–25 mm or *Microthespis* sp., 27–35 mm) and he had relied only on literature records. After examining the specimens from the MRSN (from photos), we can confirm that there is no *B. brachyptera* from Israel in the Festa collection. We assume that the Jericho finding referred to a female of *Microthespis dmitriewi* or a female of *Rivetina* sp., which are common in the Dead Sea area and can sometimes be mistaken for *Bolivaria*.

The second doubtful record is that of *Geomantis larvoides* Pantel, 1896 (as a large nymph of "*Geomantis*? *larvoides*"), listed by Bodenheimer (1935*a*, *c*, 1937). Bodenheimer (1935*c*: 157) described the observation (most probably his own one): "Große Larve bei Jericho (A.E.) 22. III. 31. Um 7^h und 9^h morgens am Boden herumlaufend" [Large nymphs near Yeriho (Jericho) (clay mud, Jordan riverbank), 22.iii.1931 walking on the ground, at hours 07:00–09:00], and added (Bodenheimer 1935*c*: 158): "Werner macht darauf aufmerksam, daß diese Art, welche mit gleich großen Larven von *Rivetina baetica* leicht zu verwechseln ist, sich von denselben durch das kurze Pronotum und das auffallend lange Abdomen unterscheidet." [Werner points out that this species, which can easily be confused with nymphs of *Rivetina baetica* of the same size, is distinguished from them by the short pronotum and the remarkably long abdomen].

Ehrmann (2011: 16) noted: "The adult males and females [of] *Geomantis larvoides* greatly resemble nymphs of the genus *Ameles*, with which they often get confused. This is certainly a reason they are consistently overlooked. This happens even in museum collections, where adult specimens of *G. larvoides* are between specimens of the genus *Ameles*".

Bodenheimer himself was doubtful about the identity of his findings. Other than Bodenheimer, no further records of *Geomantis* from the southern Levant can be found in the literature or in the SMNHTAU collection.

MATERIALS AND METHODS

The following institutional acronyms are used:

HUJI – Entomological collection, Hebrew University of Jerusalem, Jerusalem, Israel;
MNHN – Muséum National d'Histoire Naturelle, Paris, France;
MRSN – Museo Regionale di Scienze Naturali di Torino, Italy;
NHM – Natural History Museum, London, UK;
NHMB – Naturhistorischen Museum in Basel, Switzerland;
OQT – Bet Margolin, Oranim Academic College of Education, Qiryat Tiv'on, Israel;
PPIS – Plant Protection and Inspection Services, Ministry of Agriculture and Food Security, Bet Dagan, Israel;

SMNHTAU – The Steinhardt Museum of Natural History, Tel Aviv University, Israel;
ZMHB – Museum für Naturkunde der Humboldt-Universität zu Berlin, Germany.

The present study is based on all (about 2400) Mantodea specimens held in the National Collection of Insects (SMNHTAU). Of these, about 1670 adult specimens are listed in the examined material list. Additional material from the entomological collections of the HUJI, PPIS and OQT have also been examined.

The SMNHTAU has acquired several academic and private collections, including some high-value material of Mantodea that summarizes more than 100 years (1915–2024) of collecting.

The authors conducted approximately 40 field trips between 2014 and 2022 (Map 1), covering approximately 30 localities spanning from north to south Israel. Collection was carried out both during the day and at night, using a variety of methods, such as hand-picking, sweeping, beating and light trapping (Fig. 4). Throughout these trips different lamp types were used and combined, such as mercury vapor (160W), blacklight bulbs and energy-saving lamps (65W) with a car battery converter, 650W or 1000W DC 12V to AC 220V.

Fig. 4. Light trap, 'En Gedi, date palm plantation, August 2017.

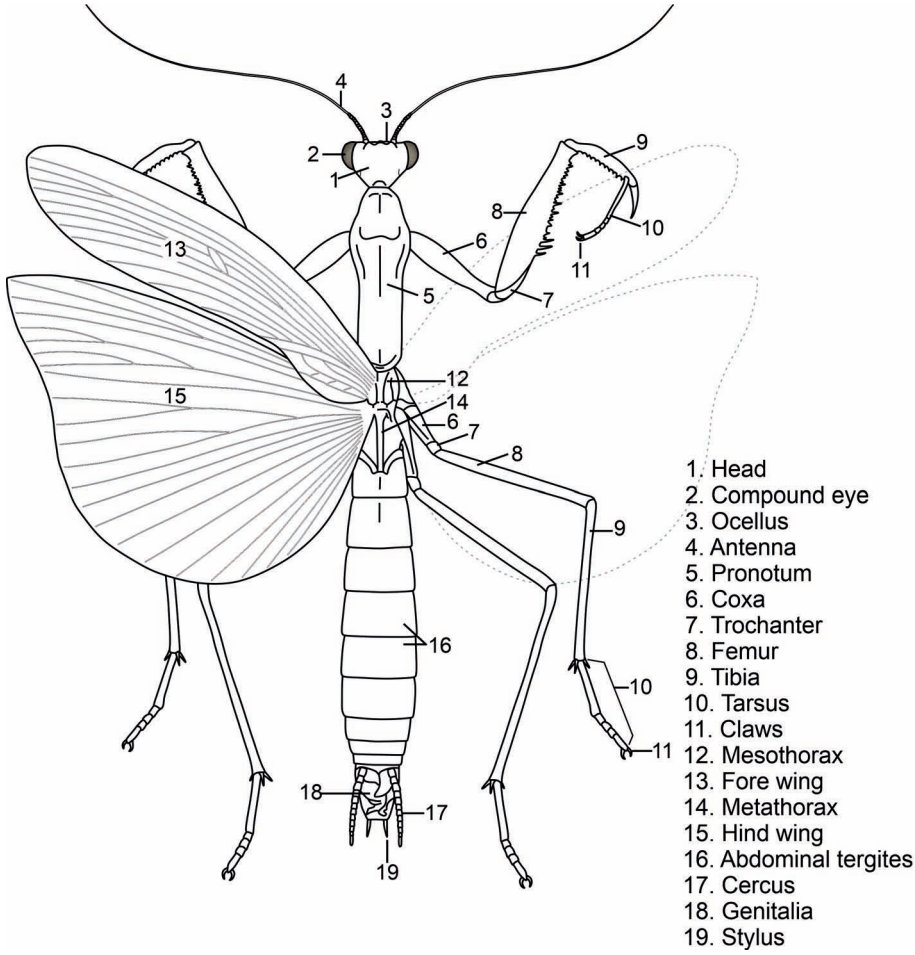


Fig. 5. Mantis habitus and dorsal morphology: *Mantis religiosa*. Modified from Morales Agacino (1947).

The pinned SMNHTAU material was entered into the SMNHTAU database (https://smnh.tau.ac.il/en/research/collections-database). The specimens were examined using a Leica M80 and Leica M125 stereoscopic microscopes. The identifications were made based on habitus morphology, color patterns and genitalia morphology. The male genitalia were prepared according to Battiston *et al.* (2010); the tip of the abdomen was removed when necessary. The prepared genitalia were stored in glycerol in micro-vials pinned next to the dried specimen. The genitalia were photographed using a cellular phone (Samsung A72) via the ocular of a stereoscopic microscope.

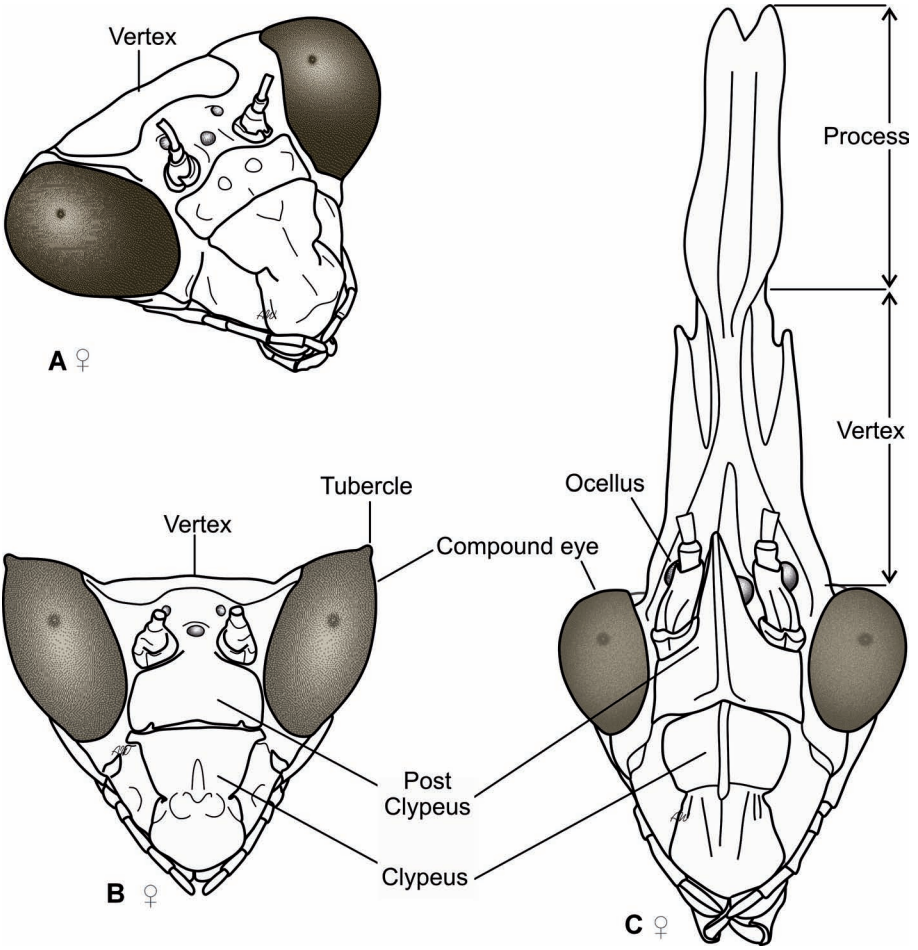


Fig. 6. Head morphology: (A) *Iris deserti*; (B) *Ameles* sp.; (C) *Empusa* sp.

The material was identified using the keys and descriptions in Battiston *et al.* (2010), Kaltenbach (1982), La Greca & Lombardo (1982), Mohammad *et al.* (2011), Abu-Dannoun (2006), as well as the original descriptions, when available. Taxonomy follows Schwarz and Roy (2019), updated in Mantodea Species File Online (Otte *et al.* 2023). The terminology of the body parts in the key follows Battiston *et al.* (2010) and Brannoch *et al.* (2017).

The habitus photographs were taken using Sony and Canon digital cameras and macro lenses, capturing images of the live and preserved mantids in natural habitats and in the collection, respectively. The images were processed in Adobe Photoshop,

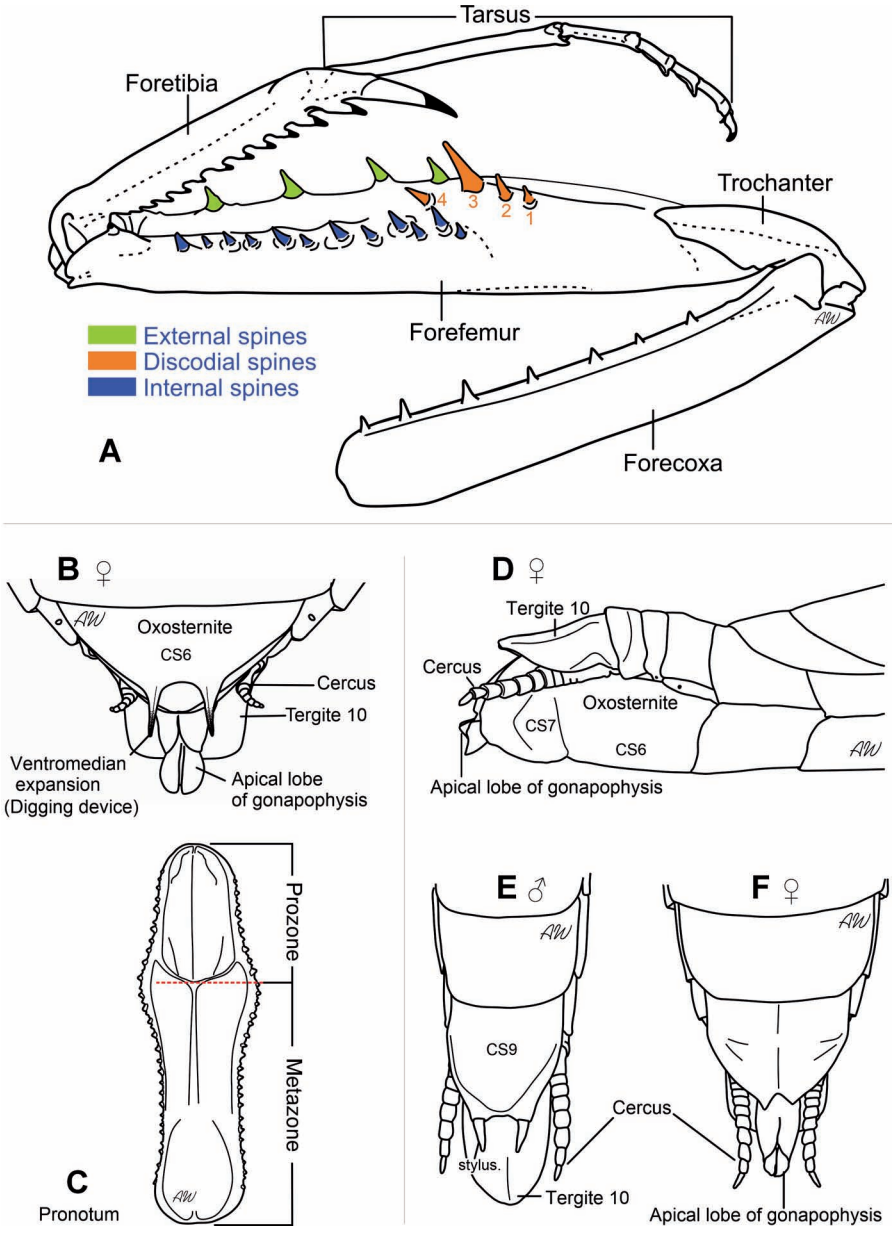


Fig. 7. General morphology: (A) foreleg, ventral view; (B) *Eremiaphila* sp., female abdomen, ventral view, terminalia; (C) *Rivetina* sp., pronotum, dorsal view, (D) *Iris oratoria*, female abdomen, lateral view, terminalia; (E) *Rivetina* sp., male abdomen, ventral view, terminalia (F) *Iris oratoria*, female abdomen, ventral view, terminalia. Abbreviations: CS – coxosternite.

and line art illustrations were either created from the original photos (primarily of fresh or live specimens) or traced from low-quality drawings in CorelDRAW by A. Weinstein; the latter software was also utilized for the layout of all plates, tables and maps. Some illustrations are reproduced after Morales Agacino (1947) and Kaltenbach (1982).

All species and part of higher taxa are accompanied by the Hebrew common name, according to "The list of the Hebrew vernacular names of mantids", submitted by the authors of this publication, approved by the Committee for the Hebrew zoological nomenclature in the Academy of the Hebrew Language (AHL 2024).

The 'Material examined' section provides collecting data (for adults only): sex, locality, date and collector. The list of the biogeographic regions is ordered north to south and west to east. The localities are listed in the alphabetical order.

The general distribution is given in the alphabetical order, and follows Kaltenbach (1982, 1984, 1991), Abu-Dannoun (2006), Battiston *et al.* (2010) and other relevant up-to-date works. Type localities are after Ehrmann (2002). Distribution in Israel is recorded by the biogeographic regions, listed north to south and west to east, based on the biogeographic subdivision of Israel after Ionescu & Eyer (2016), modified from Theodor (1975).

The measurement method follows Brannoch (2017). The body length is measured from the apex of the head to the tip of the abdomen (including the supra-anal plate) or to the apex of the wings when the wings extend beyond the end of the apex of the supra-anal plate. The body length represents the range of adult body lengths of specimens in the SMNHTAU collection. The ootheca length is based on the SMNHTAU collection material or taken from Kaltenbach (1982), Abu-Dannoun (2006), Battiston *et al.* (2010) and Rauscher (in litt.).

Biological notes present information on the distribution and habitat of each species, along with ecological and biological notes. The classification of habitats follows Danin (1992).

Conservation: Regrettably, none of the mantid species in Israel have been formally assessed by the IUCN (2025) due to insufficient information. Therefore, we rely on our in-depth knowledge of the Israeli mantids and evaluate the included species according to the IUCN terminology.

The 'Notes' section presents additional information and comments that, where appropriate, also apply to the higher taxa.

The map of the biogeographical regions of Israel (Map 1) is after Ionescu & Eyer (2016), modified from Theodor (1975). The map of the phytogeographical regions of Israel (Map 2) is after Danin & Plitmann (1987) and Zohary (1962). Isohyets of average annual rainfall are from Orni & Efrat (1971). Sandy areas in the biogeographical map and the individual species maps are retrieved from a Google satellite map (Google 2023). Transliterated names of localities in Israel follow the Israel Touring Map (Survey of Israel 2009). Where names of localities have changed, the most recent transliterated Hebrew names are provided together with

alternative names cited in brackets. Before 1917, the term 'Palestine' was applied to different territories by different authors, sometimes including Sinai Peninsula, Transjordan and adjacent areas; in 1917–1948, it referred to the territory under the British Mandate and included Transjordan. In the current study, the term 'Palestine' refers to territory of the modern State of Israel before 1948.

Localities presented on the individual species maps are approximate (due to the map's small scale) and include records of nymph specimens. Seasonal occurrences are presented irrespective of the localities and number of records due to insufficient data, and refer only to the appearance of adult females and males in their natural habitat. The ootheca (Figs 68, 69) are recorded in natural habitats, apart from exceptional cases (e.g. deposition in captivity shortly after capture or by lab-grown females).

The maps (presence records) and the seasonal occurrence table (Fig. 60) graphically summarize the information from two main sources: (1) the SMNHTAU Mantodea collection and (2) online platforms, i.e. photographs published by two local Facebook (2024*a*, *b*) groups and the citizen-science platform iNaturalist (2024); the URLs for the latter are provided in the references. Additional information was obtained from J. Wahrman Lab notebook remarks, private communication and personal documentation by Wahrman's research team (Wahrman, in litt.), and from the unpublished high school thesis by D. Rauscher (Rauscher, in litt.). Data from the online sources (photos) are included only if clear identification by us (D.S., A.W., B.S.), with dates and localities, has been possible.

Online FB groups (see the citizen-science chapter) were found to be very valuable, as they not only supplied complementary information and photographic evidence, but also provided evidence of possibilities of new species, new records and new sites for additional search and collection. These groups were also a useful source for dates of copulation and ootheca deposition, data that cannot be acquired from the dry material.

Abbreviations used in the text: RM – the ratio between the length of the metazone and its minimum width.

TAXONOMY

The checklist refers only to species which presence was either revealed or confirmed during the recent study. For species that are noted in earlier literature, but have no proven record or verification, see the Historical Review section and Notes under individual species accounts.

Checklist of Mantodea in Israel

Superfamily Nanomantoidea Brunner von Wattenwyl, 1893
Family Amorphoscelidae Stål, 1877
Subfamily Perlamantinae Giglio-Tos, 1913
Genus *Perlamantis* Guérin-Méneville, 1843
Perlamantis alliberti Guérin-Méneville, 1843
Superfamily Gonypetoidea Westwood, 1889
Family Gonypetidae Westwood, 1889
Subfamily Gonypetinae Westwood, 1889
Genus *Holaptilon* Beier, 1964
Holaptilon pusillulum Beier, 1964
Superfamily Eremiaphiloidea Saussure, 1869
Family Rivetinidae Ehrmann & Roy, 2002
Subfamily Rivetininae Ehrmann & Roy, 2002
Genus *Rivetina* Berland & Chopard, 1922
Rivetina baetica tenuidentata La Greca & Lombardo, 1982
Rivetina '*balcanica*'
Rivetina byblica La Greca & Lombardo, 1982
Genus *Microthespis* Werner, 1908
Microthespis dmitriewi Werner, 1908
Genus *Eremoplana*, Stål, 1877
Eremoplana infelix Uvarov, 1924
Family Amelidae Westwood, 1889
Genus *Ameles* Burmeister, 1838
Ameles heldreichi Brunner v. Wattenwyl, 1882
Ameles kervillei Bolívar, 1911
Family Eremiaphilidae Saussure, 1869
Subfamily Iridinae Westwood, 1889
Genus *Iris* Saussure, 1869
Iris oratoria (Linnaeus, 1758)
Iris deserti Uvarov, 1923
Iris caeca Uvarov, 1931
Subfamily Eremiaphilinae Saussure, 1869
Genus *Eremiaphila* Lefebvre, 1835
Eremiaphila arabica Saussure, 1871
Eremiaphila brunneri Werner, 1905
Eremiaphila bovei Lefebvre, 1835
Eremiaphila braueri Krauss, 1902
Eremiaphila genei Lefebvre, 1835
Family Toxoderidae Saussure, 1869
Subfamily Heterochaetinae Brunner v. Wattenwyl, 1893
Genus *Heterochaeta* Westwood, 1843
Heterochaeta pantherina (Saussure, 1872)
Subfamily Oxyothespinae Giglio-Tos, 1916
Genus *Sinaiella* Uvarov, 1924
Sinaiella nebulosa Uvarov, 1924
Genus *Severinia* Finot, 1902
Severinia lemoroi (Finot, 1893)
Severinia popovi (Kaltenbach, 1982)
Subfamily Toxoderinae Saussure, 1869
Genus *Pareuthyphlebs* Werner, 1928
Pareuthyphlebs occidentalis Werner, 1928
Pareuthyphlebs palmonii (Uvarov, 1939*b*)
Genus *Roythespis* Stiewe, 2025
Roythespis israelensis Stiewe, Weinstein & Simon, 2025
Superfamily Miomantoidea Westwood, 1889
Family Miomantidae Westwood, 1889
Subfamily Miomantinae Westwood, 1889
Genus *Miomantis* Saussure, 1870
Miomantis paykullii Stål, 1871
Superfamily Galinthiadoidea Giglio-Tos, 1919
Family *Galinthiadidae* Giglio-Tos, 1919
Genus *Galinthias* Stål, 1877
Galinthias philbyi (Uvarov, 1936)
Superfamily Hymenopoidea Giglio-Tos, 1915
Family Empusidae Burmeister, 1838
Subfamily Blepharodinae Giglio-Tos, 1919
Genus *Blepharopsis* Rehn, 1902
Blepharopsis mendica (Fabricius, 1775)
Subfam. Empusinae Burmeister, 1838
Genus *Empusa* Illiger, 1798
Empusa fasciata Brullé, 1832
guttula complex
Empusa guttula (Thunberg, 1815)
Empusa hedenborgii Stål, 1877
Genus *Hypsicorypha* Krauss, 1892
Hypsicorypha gracilis (Burmeister, 1838)
Superfamily Mantoidea Latreille, 1802
Family Mantidae, Latreille, 1802
Subfamily Mantinae, Latreille, 1802
Genus *Mantis* Linnaeus, 1758
Mantis religiosa (Linnaeus, 1758):
Subfamily Tenoderinae Brunner v. Wattenwyl, 1893
Genus *Sphodromantis* Stål, 1871
Sphodromantis viridis (Forskål, 1775)

Key to Mantodea species in Israel

An identification key is provided below with additional identification remarks. The key refers to the adult stage only, although certain typical characters already feature in nymphs. Apart from the genus *Rivetina*, which only references males, key features are provided for both females and males**.**

1 Male and female apterous ..... *Holaptilon pusillulum* Beier, 1964

Length: ♂ ~10.0 mm, ♀ ~13.5–16.0 mm. Fore coxa dark colored (Figs 8A, 17B).

– Male and female macropterous or brachypterous 2

2 Fore tibia without spines (Figs 8B(1), 16C). Fore femora with one, very small, discoidal spine (Figs 8B(2), 16C) .... *Perlamantis alliberti* Guérin-Méneville, 1843

Length: ♂ ~17.5–18.8 mm, ♀ ~18.3–18.5 mm. Pronotum as long as, or longer than, broad (Fig. 8C). Male and female macropterous (Fig. 16A).

– Fore tibia with spines (Fig. 7A). Fore femora with more than one discoidal spine 3

3 Pronotum nearly as broad as long (Fig. 8D). *Eremiaphila* Lefebvre, 1835..... 4

Head nearly as broad as pronotum (Fig. 8D). Female – 6th abdominal sternite (st) with 2 terminal spikes (Fig. 8E1). Male and female brachypterous (Fig. 9). All species ground-dwelling.

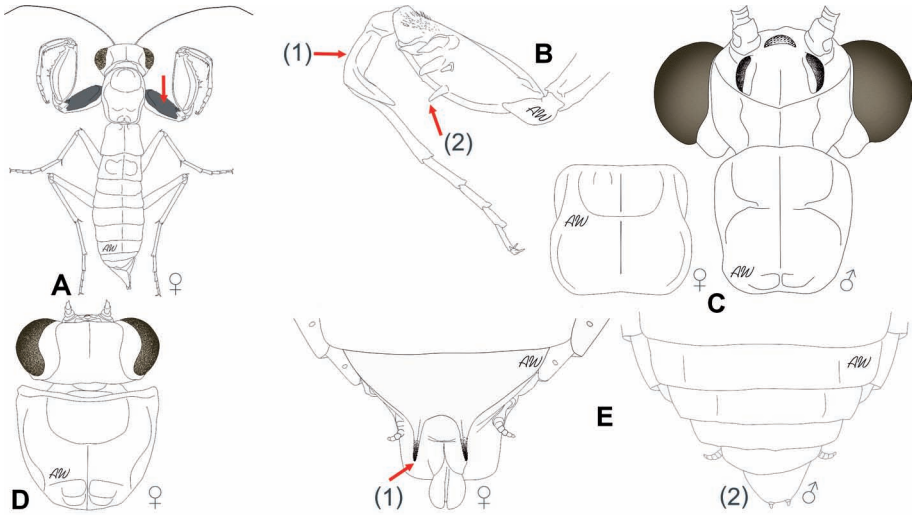


Fig. 8. General morphology: (A) *Holaptilon pusillulum*, ♀ habitus, dorsal view; (B) *Perlamantis alliberti*, fore leg, lateral view, (1) – tibia, (2) – discoidal spine on femur; (C) *P. alliberti*, ♀ and ♂ pronotum, dorsal view; (D) *Eremiaphila* spp., ♀ pronotum, dorsal view; (E) *Eremiaphila* spp. ♀ (1) and ♂ (2) abdominal sternite, ventral view, terminal spikes shown with red arrow.

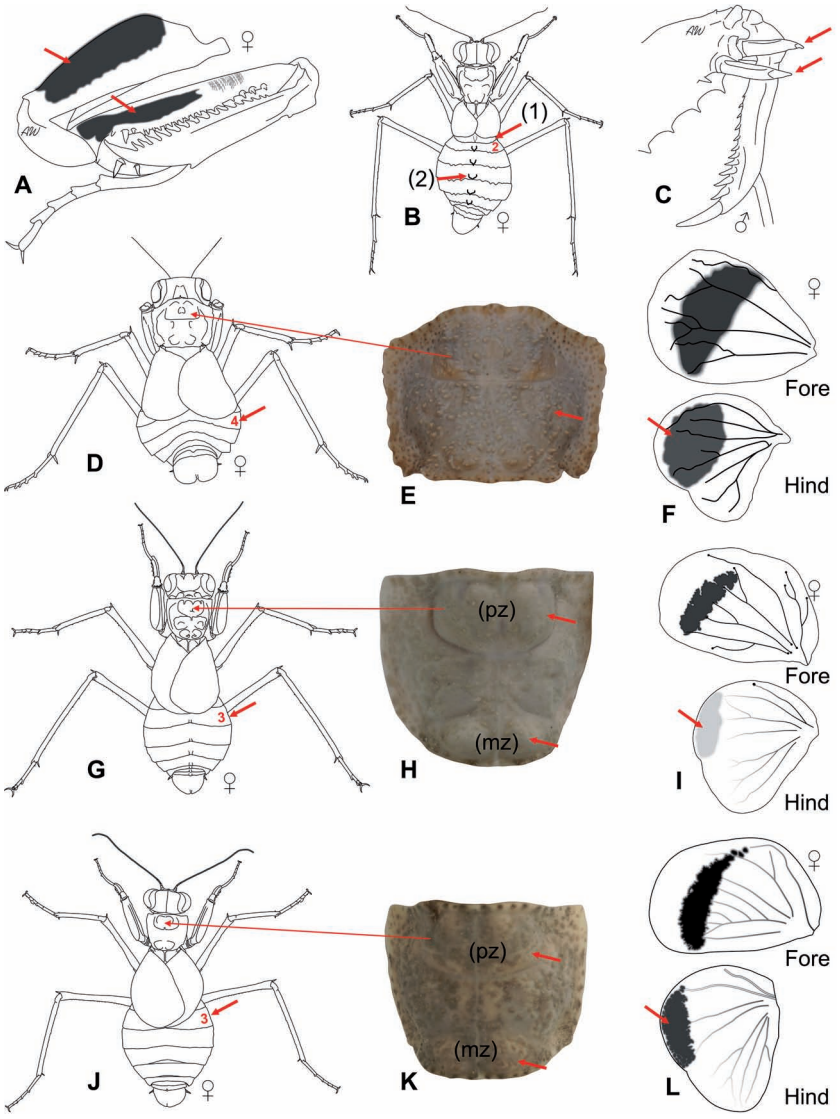


Fig. 9. General morphology: (A) *Eremiaphila brunneri*, fore leg, ventral view; (B–C) *Eremiaphila bovei*: (B) ♀ habitus, dorsal view, (1) – first abdominal tergite, (2) – short transverse carinae; (C) ♂ fore femora, interior view; (D–F) *Eremiaphila genei*: (D) ♀ habitus, dorsal view, 4th abdominal tergite shown with red arrow; (E) ♀ pronotum, dorsal view; (F) ♀ fore and hind wings, ventral view; (G–I) *Eremiaphila braueri*: (G) ♀ habitus, dorsal view, 3rd abdominal tergite shown with red arrow; (H) ♀ pronotum, dorsal view; (I) ♀ fore and hind wings, ventral view; (J–L) *Eremiaphila arabica*: (J) ♀ habitus, dorsal view, 3rd abdominal tergite shown with red arrow; (K)♀ pronotum, dorsal view; (L) ♀ fore and hind wings, ventral view; Abbreviations: (pz) – prozone of pronotum, (mz) – metazone of pronotum.

– Pronotum longer than broad (Fig. 7C) (excluding lateral lobes or processes) 8

4 Fore coxa and femora with black patches on inner face (Fig. 9A) (present in adults and nymphs) .....*Eremiaphila brunneri* Werner, 1905

Length: ♂ ~18.0–21.5 mm, ♀ ~21.5–29.0 mm (Fig. 34).

– Fore coxa and femora without black patches on inner face..... 5

5 Wings do not surpass the first abdominal tergite (Fig. 9B(1))..... ..... *Eremiaphila bovei* Lefebvre, 1835

Length: ♂ ~11.0–15.0 mm, ♀ ~15.5–21.5 mm. Female – abdominal 3–7 tergites with prominent short carinae (Figs 9B(2), 35). Male – fore femora with two prominent spines near apex (Figs 9C, 35).

– Wings surpass the first abdominal tergite (Fig. 9D–G, J)..... 6

Forewing with a ventral medial black semilunar streak (Fig. 9F, I, L).

6 Pronotum distinctly rough and granulated (Fig. 9E) .... *Eremiaphila genei* Lefebvre, 1835

Length: ♂ ~14.0–15.0 mm, ♀ ~17.0–25.0 mm. Hindwing reddish, apical black streak (Figs 9F, 37). Mt Hermon, above 1600 m.

– Pronotum smoother, barely granulated (Fig. 9H, K) 7

7 Prozone (pz) and metazone (mz) distinctly prominent (Fig. 9H). Hindwing with apical pale streak (Fig. 9I)..... *Eremiaphila braueri* Krauss, 1902

Length: ♂ ~21.0–22.5 mm, ♀ ~23.5–28.5 mm (Fig. 35).

– Prozone (pz) and metazone (mz) slightly prominent (Fig. 9K). Hindwing with apical dark streak (Fig. 9L) .....*Eremiaphila arabica* Saussure, 1871

Length: ♂ ~28.0–30.0 mm, ♀ ~36.0–38.0 mm (Fig. 33).

8 Mid and hind femora with lobes (Figs 10B, 11D, 11K) 9

– Mid and hind femora without lobes..... 13

9 Body length < 22 mm (small mantids) .....*Galinthias philbyi* (Uvarov, 1936)

Length: ♂ ~18.5 mm, ♀ ~18.0–21.0 mm. Eyes roundly pointed, projecting ahead (in dorsal view) (Fig. 10A). On acacia trees in the 'Arava Valley (Fig. 44).

– Body length > 50 mm (larger mantids)..... 10

Male adult – antennae pectinate (Fig. 10C1). Female adult – antennae simple (Fig. 10C2).

10 Mid and hind femora with acute lobes (Fig. 10D). Pronotum short; not more than 2.4 as long as wide (Fig. 10E). Lateral cervical sclerite (lpe) developed, edges strongly toothed (Fig. 10E). Vertex extended into short conical process, furcated at apex (Fig. 10F, 45B).....*Blepharopsis mendica* Fabricius, 1775

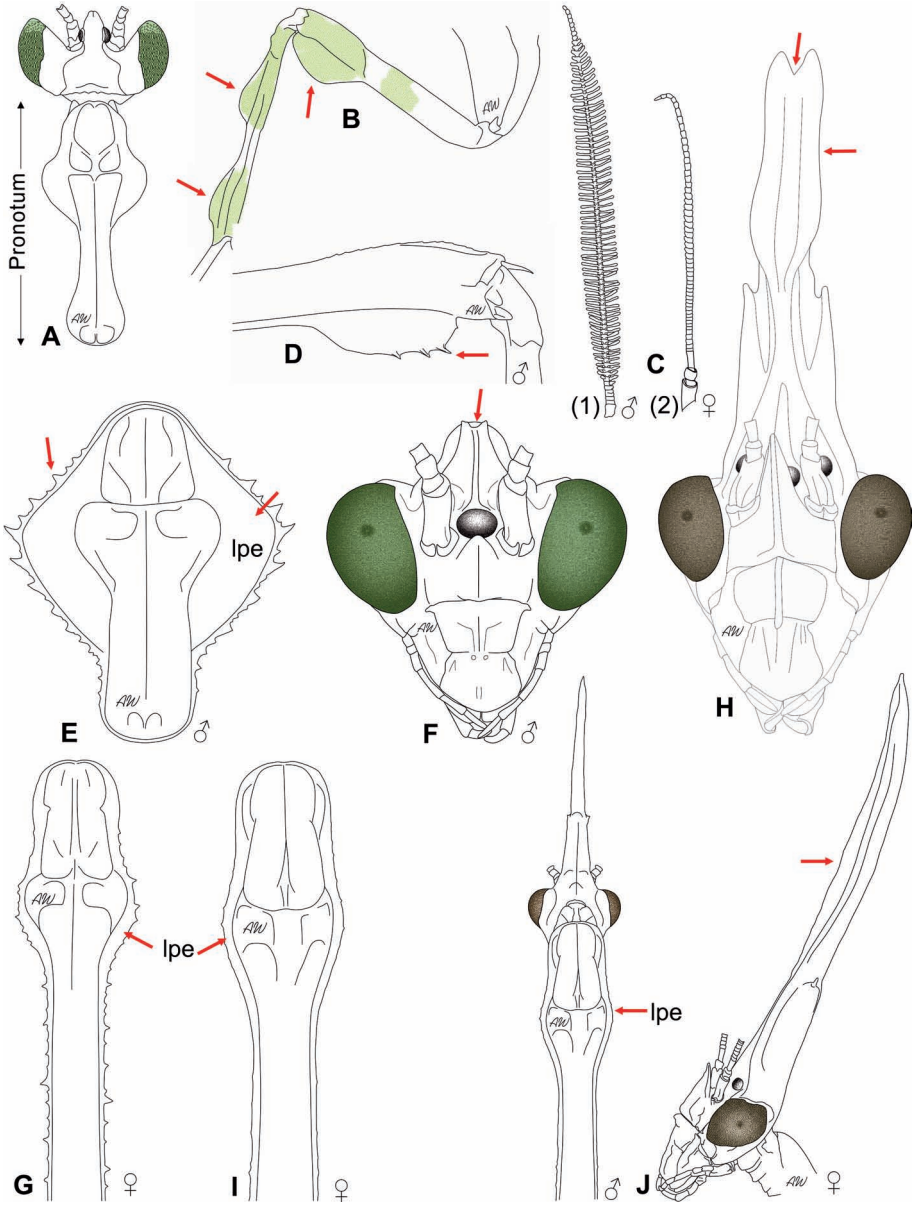


Fig. 10. General morphology: (A–C) *Galinthias philbyi*: (A) pronotum and head, dorsal view; (B) hind femur and tibia, lateral view, lobes shown with red arrows; (C) (1) ♂ pectinated antennae, (2) ♀ simple antennae; (D–F) *Blepharopsis mendica*: (D) ♀ femur with acute lobes (shown with red arrow), lateral view; (E) ♂ pronotum, dorsal view; (F) ♂ head details; (G, H) *Empusa* sp.: (G) ♀ pronotum, dorsal view; (H) head details; (I, J) *Hypsicorypha gracilis*: (I) ♀ pronotum, dorsal view; (J) ♂ dorsal view, ♀ lateral view, head details. Abbreviations: lpe – lateral cervical sclerite.

Length: ♂ ~53.5–64.0 mm, ♀ ~52.0–64.5 mm. Adult color green, rarely brown-rose, marbled with white. Pronotum and legs hairy (Fig. 45).

– Mid and hind femora with round lobes (Fig. 11D, K). Pronotum long; 3.5–5 as long as wide. Lateral cervical sclerite (lpe) narrow, edges of the pronotum moderately or barely toothed (Fig. 10G). Vertex extended into prolonged process (Fig. 10H). ..... *Empusa* Illiger, 1798 11

11 Apex of postclypeus vertical (Fig. 11A). Fore femora broad – approximately 5× longer than wide (Fig. 11C) ..... *Empusa fasciata* Brullé, 1832

Length: ♂ ~63.7–72.5 mm, ♀ ~63.5–79.5 mm. Mid and hind coxae lobes, high, mid coxa lobe approximately 4× wider than high in female and approximately 2.5× wider in male (Fig. 11B). Abdominal sternite lobes – distinctly prominent (Fig. 47D, E).

– Apex of postclypeus bent forward (Fig. 11E, H). Fore femora narrow, 6–9× longer than wide (Fig. 11G, J) 12

12 Mid coxae lobes approximately 7× wider than high in female and approximately 13× wider in male (Fig. 11F). Abdominal sternites lobes – slightly prominent (Fig. 48C) ..... *Empusa hedenborgii* Stål, 1877

Length: ♂ ~55.0–71.0 mm, ♀ ~60.0–79.0 mm. Along the Rift Valley up to Mt Hermon (Fig. 48).

– Mid coxae lobes approximately 6× wider than high in female and approximately 16× wider in male (Fig. 11I). Abdominal sternite lobes – distinctly prominent (Fig. 49C) ..... *Empusa guttula* (Thunberg, 1815)

Length: ♂ ~66.0–71.0 mm, ♀ ~82.0–85.0 mm. Central Negev (Fig. 48).

13 Vertex extended into prolonged process (Fig. 10J) .... *Hypsicorypha gracilis* (Burmeister, 1838)

Length: ♂ ~69.0–73.0 mm, ♀ ~78.0–86.0 mm. Abdominal sternites without lobes. Male adult – antennae pectinate (Fig. 10C1). Female adult – antennae simple (Fig. 10C2, 50).

– Vertex extended into short conical process (Fig. 12A, B) or round vertex (Fig. 13F) 14

14 Vertex extended into conical short process, divided at apex (Fig. 12A, B) ..... *Pareuthyphlebs* Werner, 1928 15

Eyes with lateral spine (Fig. 12A, B, F). Cerci broadly foliaceous (Fig. 12F). Wings shorter than abdomen; mid and hind legs short compared to fore legs (Figs 41, 42).

– Vertex round, not extended (Fig. 13E, F) 16

15 Pronotum is relatively broad, 4–5× longer than wide (Fig. 12C). Lateral spine of eye tubular with blunt apex. (Figs 12A(1), 37C). Vertex extended into short process, slightly furcated at apex (Figs 12A(2), 38C) .... *Pareuthyphlebs occidentalis* Werner, 1928

Length: ♂ ~48.0 mm, ♀ ~67.0–73.0 mm (Fig. 41).

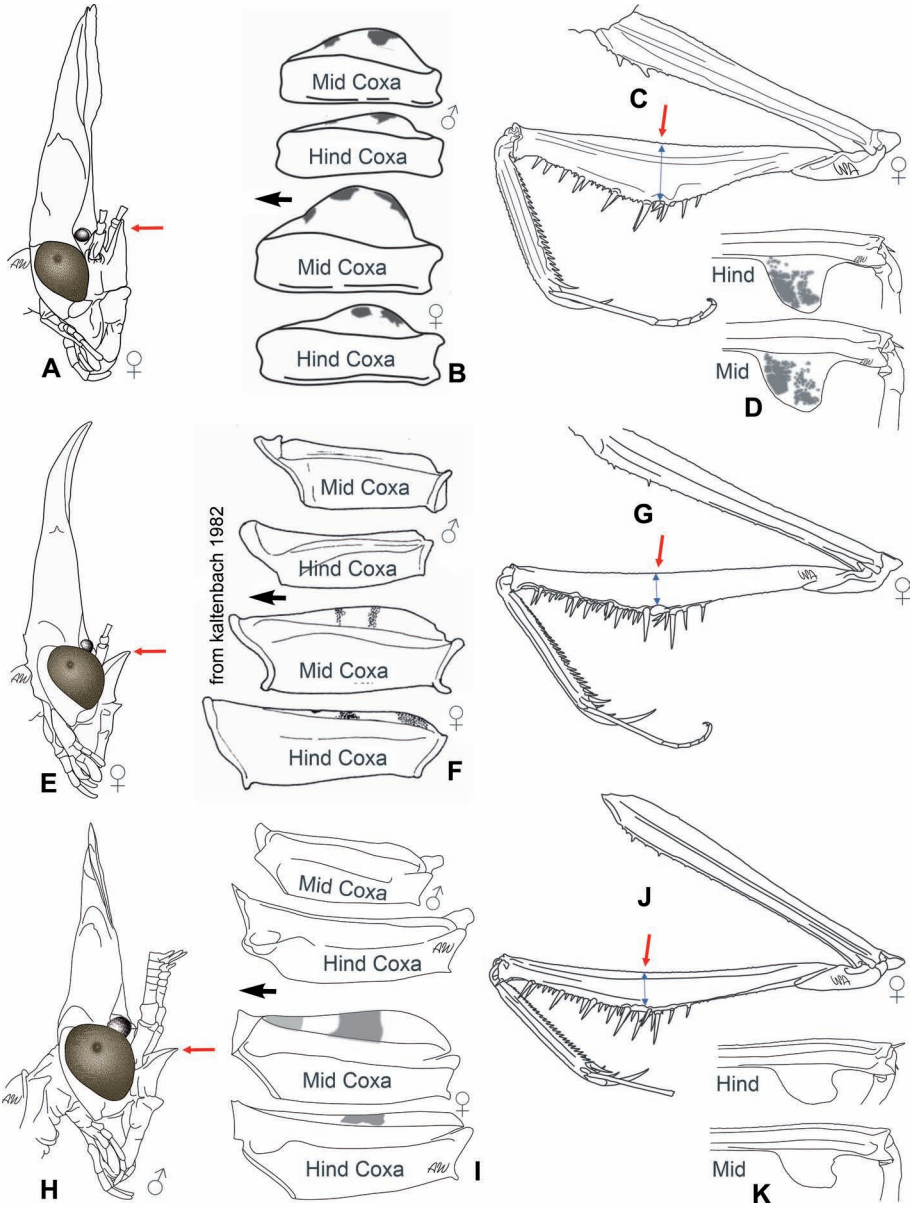


Fig. 11. General morphology: (A–D) *Empusa fasciata* (A) ♀ head details, lateral view; (B) ♀ and ♂ coxae lobes, mid and hind; (C) ♀ fore femora, lateral view; (D) tibia and femora lobes; (E–G) *Empusa hedenborgii*: (E) ♀ head details, lateral view; (F) ♀ and ♂ coxae lobes, mid and hind, from Kaltenbach (1982); (G) ♀ fore femora, lateral view; (I–K) *Empusa guttula*: (H) ♂ head details, lateral; (I) ♀ and ♂ coxae lobes, mid and hind; (J) ♀ fore femora, lateral view; (K) tibia and femora lobes.

– Pronotum is relatively slender, approximately 6× longer than wide (Fig. 12D). Lateral spine of eye tubular with conical apex (Figs 12B(1), 39C). Vertex extended into slightly long process, furcated at apex (Figs 12B(2), 39C)..... ..... *Pareuthyphlebs palmonii* (Uvarov, 1939*b*)
Length: ♂ ~49.0 mm, ♀ ~63.0–66.0 mm (Fig. 41).

16 Pronotum <3× longer than maximum width..... 17
Male macropterous, female brachypterous

– Pronotum >3× longer than maximum width..... 19
Male macropterous, female brachypterous or both sexes macropterous.

17 Pronotum ventral side with heart-shaped black spot (Figs 13A, 23D) (present in adults and nymphs) .....*Microthespis dmitriewi* Werner, 1908
Length: ♂ ~27.0–34.0 mm, ♀ ~30.0–35.0 mm (Fig. 23).

– Pronotum ventral side with no black spot. *Ameles* Burmeister, 1838..... 18

18 Eyes conical, with apical tubercle (Fig. 13B, 13C) ....*Ameles heldreichi* Brunner von Wattenwyl, 1882
Length: ♂ ~24.0–26.0 mm, ♀ ~21.0–24.5 mm (Fig. 26).

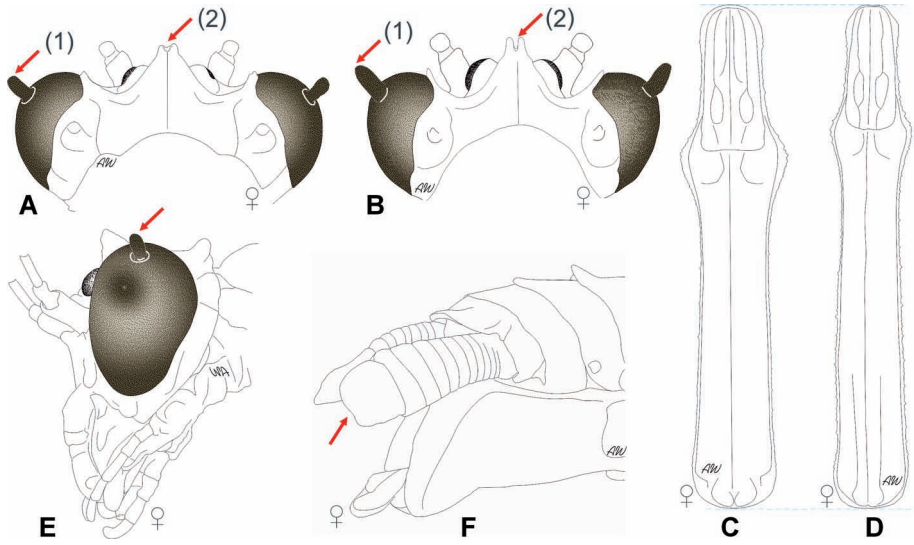


Fig. 12. General morphology: (A, B) *Pareuthyphlebs* spp. ♀ head, dorsal view, (1) – eye lateral spine, (2) – process of vertex: (A) *Pareuthyphlebs occidentalis*; (B) *Pareuthyphlebs palmonii*; (C, D) *Pareuthyphlebs* spp. ♀ head, dorsal view: (C) *Pareuthyphlebs occidentalis*; (D) *Pareuthyphlebs palmonii*; (E, F) *Pareuthyphlebs* spp. ♀: (E) head, lateral; (F) posterior part of the abdomen, cercus.

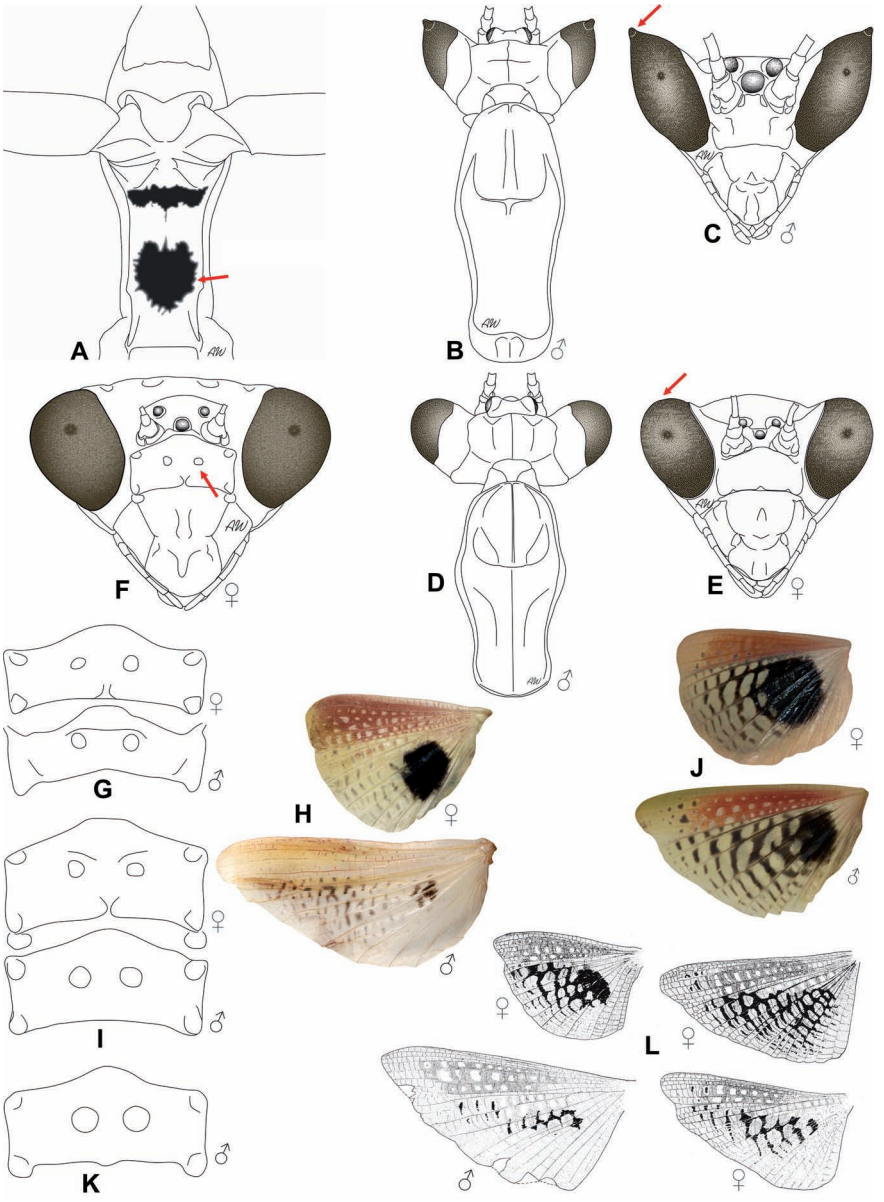


Fig. 13. General morphology: (A) *Microthespis dmitriewi*, pronotum, ventral view; (B) *Ameles heldreichi*, ♂ pronotum and head, dorsal view; (C) *A. heldreichi*, ♂ head; (D) *Ameles kervillei*, ♂ pronotum and head, dorsal view; (E) *A. kervillei*, ♀ head; (F) *Iris* sp., ♀ face, postclypeus shown with red arrow; (G) *Iris deserti*, ♀ and ♂ postclypeus; (H) *I. deserti*, ♀ and ♂ hindwing; (I) *Iris oratoria*, ♀ and ♂ postclypeus; (J) *I. oratoria*, ♀ and ♂ hindwing; (K) *Iris caeca*, ♂ postclypeus; (L) *I. caeca*, ♀ and ♂ hindwing, from Kaltenbach (1982).

– Eyes rounded with no apical tubercle (Fig. 13D, E) ..... *Ameles kervillei* Bolívar, 1911

Length: ♂ ~25.0–34.0 mm, ♀ ~19.0–21.0 mm. Female – prominent short carinae on abdominal 2–5 tergites (lateral view) (Fig. 28).

19 Postclypeus with 2 small round medial tubercles (Fig. 13F). *Iris* Saussure, 1869 20

Male macropterous, female brachypterous

– Postclypeus with no medial tubercles 22

20 Postclypeus 2.5–3× wider than high (Fig. 13G) ..... *Iris deserti* Uvarov, 1923

Length: ♂ ~28.0–30.0 mm, ♀ ~38.0–54.0 mm. Female – hindwing spot compact round, black (Fig. 13H). Male – hindwing spot indistinct, barely visible (Fig. 13H, 30).

– Postclypeus approximately 2× wider than high (Fig. 13I, K) 21

21 Hindwing spot – rounded, black, with dark net (Fig. 13J) ..... *Iris oratoria* Linnaeus, 1758

Length: ♂ ~38.0–53.0 mm, ♀ ~34.0–47.0 mm (Fig. 29).

– Hindwing spot – indistinct, diffuse or composed of only dark net (variable) (Fig. 13L) ..... *Iris caeca* Uvarov 1931

Length: ♂ ~38.0–53.0 mm, ♀ ~34.0–47.0 mm (Fig. 31). No females collected in Israel.

22 Fore coxa with white black-ringed spot, or black spot only (inner face, near base) present also in the last juvenile stages (Figs 14A, 51C) ..... *Mantis religiosa* (Linnaeus, 1758)

Length: ♂ ~69.0–70.0 mm, ♀ ~65.0–89.5 mm. Male and female macropterous. (Fig. 51)

– Fore coxa with no black or ringed spot 23

23 Forewings with white stigma (Fig. 14B) ..... *Sphodromantis viridis* (Forskål, 1775)

Length: ♂ ~70.0–82.0 mm, ♀ ~73.0–87.0 mm. Small but evident tubercle between base of antenna and internal edge of eye (Figs 14C, 52B). Green or brownish gray. Male and female macropterous (Fig. 52).

– Forewings with no white stigma 24

24 Body length > 42 mm (medium size mantids) 25

– Body length < 43 mm (larger mantids) 29

25 Head flat (anterior view), eyes oval (Fig. 14E). Head approximately 3× wider than high (Fig. 14D). Cerci filiform, elongated (Fig. 14F) ..... *Miomantis paykullii* Stål, 1871

Length: ♂ ~29.0–37.0 mm, ♀ ~34.0–42.0 mm (Fig. 43).

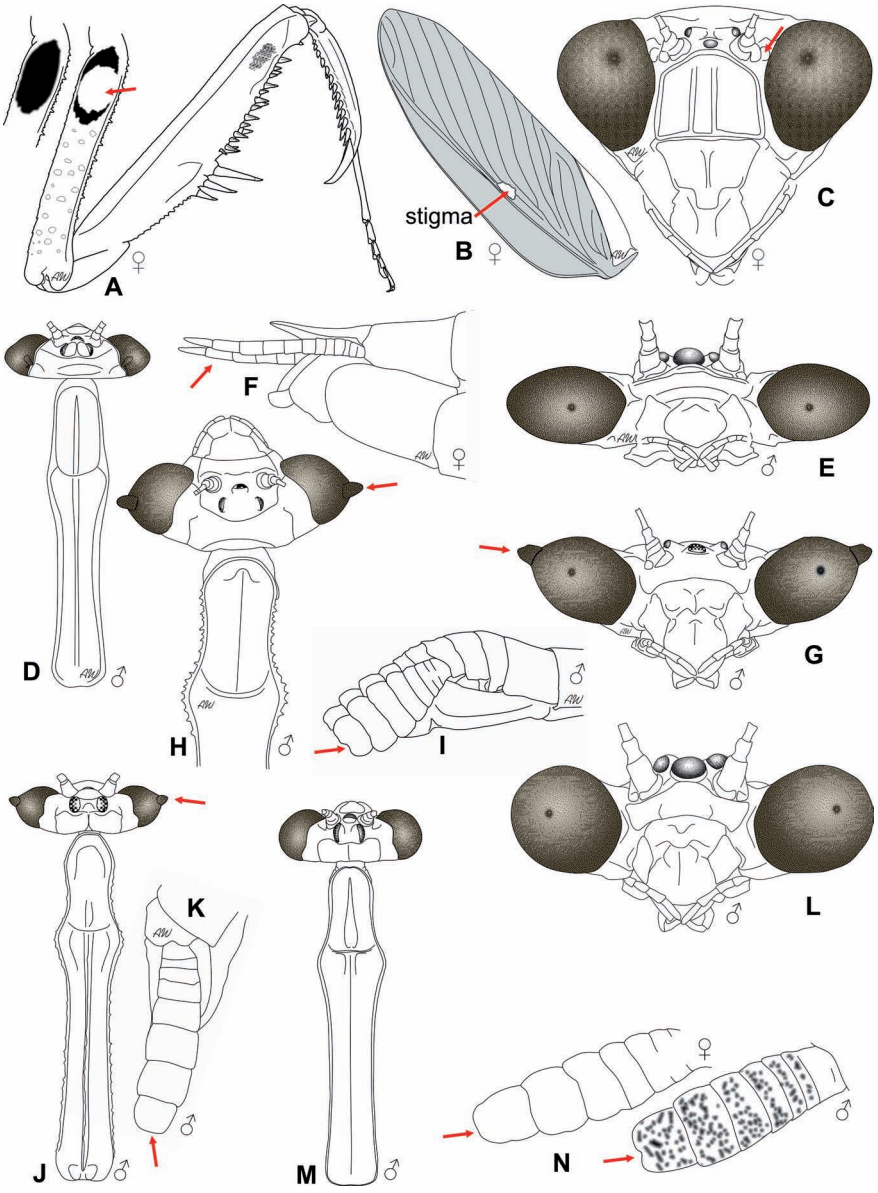


Fig. 14. General morphology: (A) *Mantis religiosa*, ♀ fore coxa, inner face view; (B) *Sphodromantis viridis*, ♀ forewing, dorsal view; (C) *S. viridis*, ♀ head; (D) *Miomantis paykullii*, ♂ pronotum and head, dorsal view; (E) *M. paykullii*, ♂ head details; (F) *M. paykullii*, ♀ cercus, lateral view; (G) *Severinia lemoroi*, ♂ head; (H) *S. lemoroi*, ♂ pronotum and head, dorsal view; (I) *S. lemoroi*, ♂ cercus, lateral view; (J) *Severinia popovi*, ♂ pronotum and head, dorsal view; (K) *S. popovi*, ♂ cercus, lateral view; (L) *Sinaiella nebulosa*, ♂ head details; (M) *S. nebulosa*, ♂ pronotum and head, dorsal view; (N) *S. nebulosa*, ♀ and ♂ cerci, lateral view.

– Head approximately 2.5× wider than high (Fig. 14G, L), anterior view. Cerci broadly foliaceous (Fig. 14I, J, N) 26

26 Eyes prominent with spines (Fig. 14G). *Severinia* Finot, 1902 27

– Eyes round without spines (Fig. 14L) ..... *Sinaiella nebulosa* Uvarov, 1924
Length: ♂ ~32.0–36.0 mm, ♀ ~36.0 mm (Fig. 39).

27 Segments of cercus distinctly not equal in width, last segment shallowly emarginated apically (Figs 14I, 40C) ..... *Severinia lemoroi* (Finot, 1893)
Length: ♂ ~27.0 mm, ♀ ~34.0–37.0 mm. Wings – transparent, anal field – yellow (Fig. 40).

– Segments of cercus almost equal in width, last segment rounded apically (Figs 14K, 40E) ..... *Severinia popovi* (Kaltenbach, 1982)
Length: ♂ ~32.0–35.5 mm. Wings – transparent, blurred brown spot between discoidal field and anal field (Fig. 40).

28 Supra-anal plate much shorter than cerci. Cerci flat, broad (Fig. 15A) 29

– Supra-anal plate much longer than cerci. Cerci filiform (Fig. 15E, G) 30

29 Last segment round apically (Figs 15A, 38B). Eyes elongated, projecting ahead (Fig. 15B) dorsal view ..... *Heterochaeta pantherina* (Saussure, 1872)
Length: ♂ ~84.0–90.0 mm, ♀ ~98.0–99.0 mm. Wings shorter than abdomen, shorter in female (Fig. 38).

– Last segment acute apically (15C). Eyes oval, flat (15D) .... *Roythespis israelensis* Stiewe, Weinstein and Simon, 2025
Length: ♂ ~62.0–64.0 mm, ♀ ~68.0 mm. Wings shorter than abdomen, shorter in female (Fig. 38E)

30 Supra-anal plate ~3× as long as cerci (Fig. 15E). Cerci filiform (Fig. 15E). Eyes round, slightly projecting ahead (Fig. 15F) dorsal view .... *Eremoplana infelix* Uvarov, 1924
Length: ♂ ~89.0–103.0 mm, ♀ ~89.0–114.0 mm. Male macropterous, female brachypterous (Fig. 24).

– Supra-anal plate ~1.5–2× as long as cerci in dorsal view (Fig. 15G) ..... *Rivetina* Berland & Chopard, 1922 31
Female – Sub-genital plate with 2 ventral spikes (Fig. 15H) ventral view. Male macropterous. Female brachypterous, wings do not overpass 3rd abdominal tergite.

31 Male only: Ratio between metazone length and its minimum width <4 (Fig. 15I) 32

– Male only: Ratio between metazone length and its minimum width >4 (Fig. 15K, L) ..... *Rivetina byblica* La Greca & Lombardo, 1982
Length: ♂ ~42.0–76.0 mm, ♀ ~49.0–70.0 mm. Male – Wings not reaching supra-anal plate; up to about 7th–9th abdominal tergite (Fig. 15J) Pronotum moderately toothed, less prominent in male (Figs 15K–L, 21).

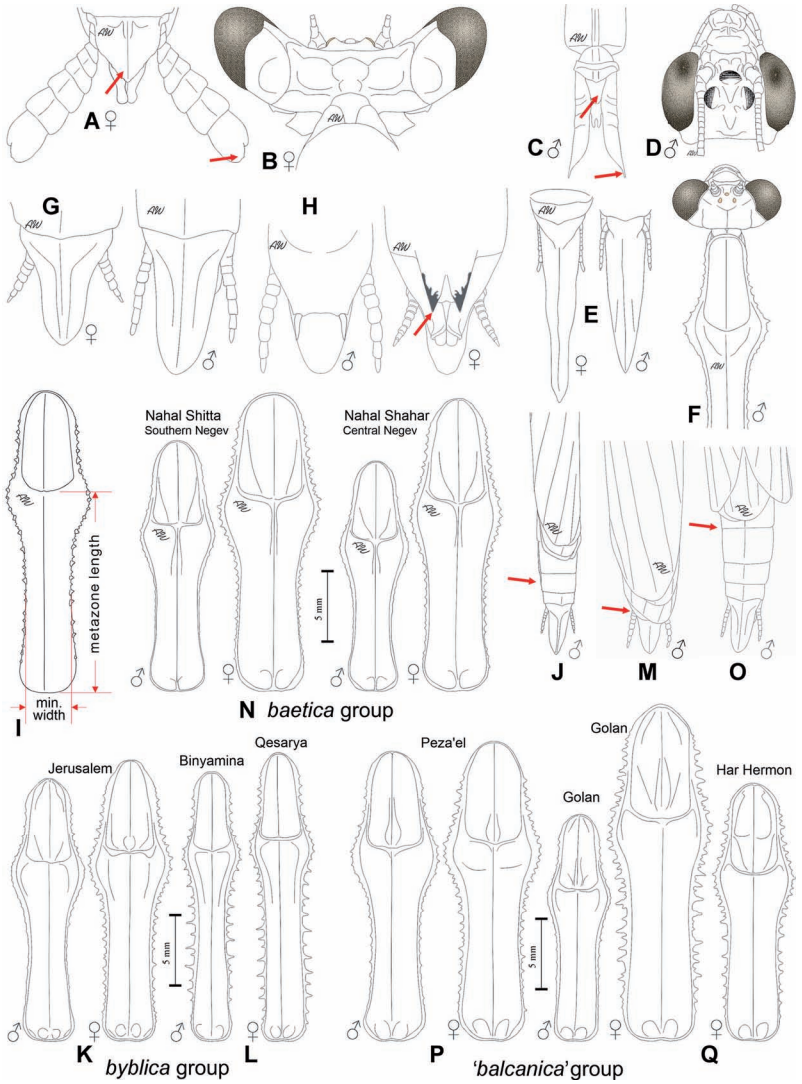


Fig. 15. General morphology: (A) *Heterochaeta pantherina*, ♀ supra-anal plate, dorsal view; (B) *H. pantherina*, ♀ head, rear view; (C) *Roythespis israelensis,* ♂ supra-anal plate, dorsal view; (D) *R. israelensis*, ♂ head, rear view; (E) *Eremoplana infelix*, ♀ and ♂ supra-anal plate, dorsal view; (F) *E. infelix*, ♂ pronotum and head, dorsal view; (G–Q) *Rivetina* spp.: (G) ♀ and ♂ supra-anal plate, dorsal view; (H) ♀ and ♂ sub-genital plate, ventral view; (I) pronotum ratio between metazone length and its minimum width; (J) *Rivetina byblica*, ♂ abdomen, caudal view; (K) *R. byblica* from Judean Hills, ♀ and ♂ pronotum, dorsal view; (L) *R. byblica* from the Coastal Plain, ♀ and ♂ pronotum, dorsal view; (M) *Rivetina baetica tenuidentata*, ♂ abdomen, caudal; (N) *R. b. tenuidentata*, ♀ and ♂ pronotum, dorsal view; (O) *Rivetina balcanica*, ♂ abdomen, caudal view; (P) *Rivetina* '*balcanica*' from the Jordan Valley, ♀ and ♂ pronotum, dorsal view; (Q) *R.* '*balcanica*' from the Golan Heights, 2♀ and ♂ pronotum, dorsal view.

32 Male only: Wings reaching or overpass supra-anal plate (Fig. 15M)..... ..... *Rivetina baetica tenuidentata* La Greca & Lombardo, 1982

Length: ♂ ~53.0–64.0 mm, ♀ ~43.0–57.0 mm. Pronotum finely toothed, less prominent in male (Figs 15N, 19)

– Male only: Wings reaching only 5th–9th abdominal tergites (Fig. 15O)..... .....*Rivetina* '*balcanica*'

Length: ♂ ~46.5–67.0 mm, ♀ ~41.5–85.0 mm. Pronotum strongly toothed, more prominent in female (Figs 15P–Q, 22).

Superfamily Nanomantoidea Brunner von Wattenwyl, 1893
Family Amorphoscelidae Stål, 1877
Subfamily Perlamantinae Giglio-Tos, 1913
Genus *Perlamantis* Guérin-Méneville, 1843
פְּנִינִי

The genus is widespread in the southern and western parts of the Mediterranean basin, especially in dry habitats. Otte *et al.* (2023) list two species. However, Battiston *et al.* (2010: 139) follow Chopard (1943) and suggest a synonymy of *Perlamantis algerica* Giglio-Tos, 1914: "because of the absence of valid distinctive characters in external morphology and in male genitalia".

Perlamantis alliberti Guérin-Méneville, 1843
Figs 8A,16A–D, 69A, Map 3
פְּנִינִי לַיְלִי

Body length: ♂ 17.5–18.8 mm, ♀ 18.3–18.5 mm.

Material examined: Israel: *Sea of Galilee area*: 2♂, Hammat Gader, 8.vi.2023, Z. Yanai; *Shomeron (Samaria)*: 5♂, Nahal Qana, 9.vii.2007, V. Kravchenko; *Southern Coastal Plain*: 1♂, Holot Nizzanim, 8.vii.2008, A. Freidberg; 1♂, Holot Nizzanim, 26.iv.2009, D. Simon; 3♂, Holot Nizzanim, 20.vi.2013, D. Simon; *Judean Foothills*: 8♂, Shoham Forest Park, 15.vii.2020, A. Weinstein; *Judean Desert*: 1♂, 'Almon, 17.ix.2012, S. Suchezki; 1♂, 'En Perat, 1.vii.2020, Y. Salaviz; *Dead Sea Area*: 1♀, 'En Gedi, 11.vii.1957, Guterman; 1♂, 'En Gedi, 10.vii.2016, A. Weinstein; 5♂, 'En Tamar, 22.x.2015, A. Weinstein; 2♂, 'En Tamar, 25.viii.2017, A. Weinstein; 4♂, 'En Tamar, 26.ix.2017, A. Weinstein; 1♂, Enot Zuqim, 27.vi.2017, I. Renan; *Northern Negev*: 1♀, Holot 'Agur, 24.ix.2013, I. Renan; 1♀, Holot Shunera, 27.vi.2014, I. Renan; 1♂, Kemehin, 2.vii.2019, A. Weinstein; 1♂, Mash'abbe Sade, 25.vi.2019, A. More Yossef; 1♂, Mash'abbe Sade, 25.vi.2020, A. More Yossef; *Central Negev*: 1♀, Biq'at Ardon, 20.vi.2012, I. Renan; 1♂, Bor Hemet, 8.viii.1993, D. Simon; 1♂, Borot Loz, 27.vii.1992, D. Rauscher; *'Arava Valley*: 1♂, 'En Yahav, 9.vi.1989, G. Cnani; 3♂, Nahal Paran, 24.vi.1979, D. Simon (all SMNHTAU).

General distribution: Israel (new record), Algeria (type locality), France, Libya, Morocco, Portugal, Spain, Tunisia.

Records in Israel: Central Coastal Plain, Central Negev, Dead Sea Area, Golan Heights, Judean Desert, Judean Foothills, Judean Hills, Northern Negev, Sea of Galilee area, Shomeron (Samaria), Southern Coastal Plain, Southern Negev, 'Arava Valley.

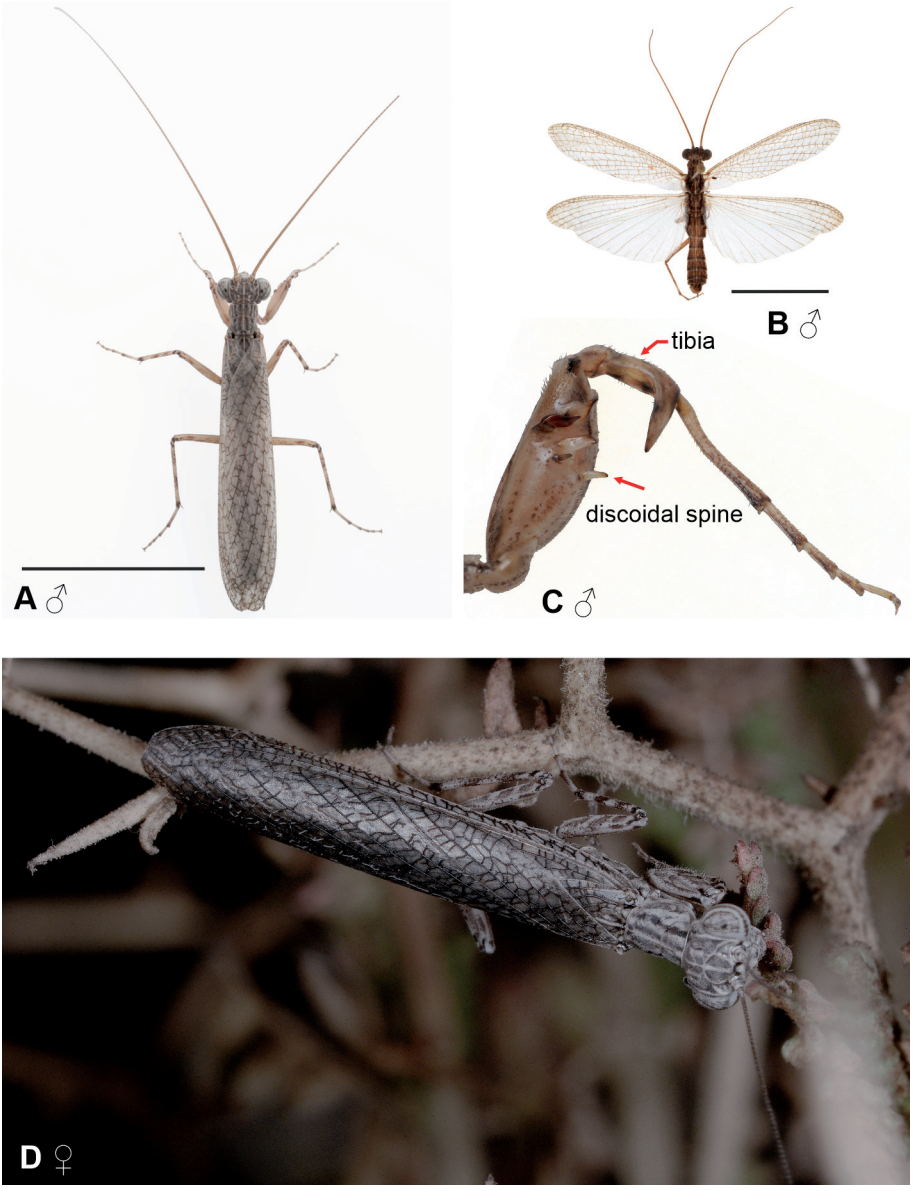
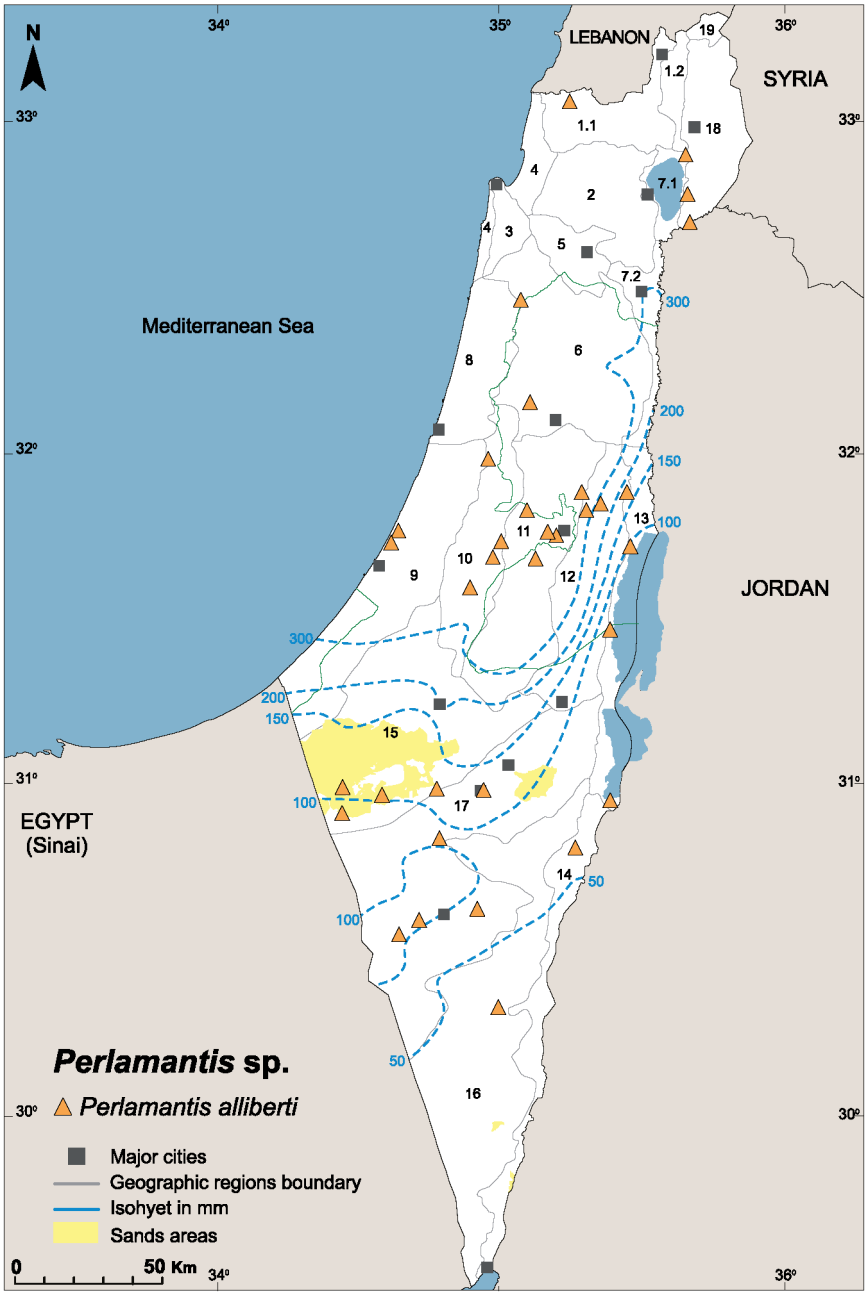


Fig. 16. *Perlamantis alliberti*: (A) Shoham Park, 15.vii.2020, ♂ live, habitus, dorsal view; (B) 324310, Bor Hemet, 8.viii.1993, ♂ habitus, dorsal view; (C) ♂ fore femur details; (D) Shoham Park, 15.vii. 2020, ♀ live, habitus; scale bar = 10 mm.



Map 3. *Perlamantis alliberti*, distribution in Israel.

Biological notes: In dry, vegetation-rich environments in the Negev, Judean Desert, Dead Sea area and the Mediterranean region. In various habitats: wadi beds, stabilized sands (Fig. 67A), garrigue and batha (shrubland) (Fig. 66B) and dry salt marshes (Fig. 67C). Adults are seen active on shrubs. We saw a female depositing an ootheca on *Sarcopoterium spinosum* (L.) Spach (Rosaceae) at night, shortly after dark, on July 2020 in Shoham Forest Park. The ootheca (Fig. 69A, length ~5 mm, n=1) is missing the outer foam shell and comprises six chambers.

Conservation: Least concern. Patchy distribution but common in the natural habitats of its areas of occurrence. Rarely seen in daylight, due to being nocturnally active. Adults, mostly males, are attracted to artificial light.

Notes: This is the sole representative of the family Amorphoscelidae, a tropical and subtropical family of the Old World with eight genera and 66 species (Otte *et al.* 2023) around the Mediterranean Basin and in Europe. The current distribution pattern suggests Atlanto-Mediterranean affinities (Battiston *et al.* 2010; Marabuto *et al.* 2014). Its presence in Israel indicates that its distribution is much wider than previously known, and it is highly likely that it will also be found at other sites in North Africa.

Superfamily Gonypetoidea Westwood, 1889
Family Gonypetidae Westwood, 1889
Subfamily Gonypetinae Westwood, 1889
Genus *Holaptilon* Beier, 1964
עַצְבָנִי

Holaptilon was described from Israel as a monotypic genus. Since then, five more species have been described. *Holaptilon brevipugilis* Kolnegari 2018 was described from Iran (Kolnegari & Vafaei 2018), along with the ootheca. The mating behavior of *H. brevipugilis* was reported by Kolnegari (2020). In the most recent publication (Mirzaee *et al.* 2024) an additional four new species are described from Iran (*H. abdullahii, H. khozestani, H. iranicum, H. tadovaniensis*) and *Holaptilon yagmur* Yılmaz & Sevgili, 2023 is synonymized with *H. brevipugilis* Kolnegari, 2018. The latter study suggests that the genus *Holaptilon* likely originated in the southern parts of the Zagros mountains in Iran (Mirzaee *et al.* 2024).

Holaptilon pusillulum Beier, 1964
Figs 8B, C, 17A–D, 68B, Map 4
עַצְבָנִי עָלוּם

Body length: ♂ ~10.0 mm, ♀ 13.5–16.0 mm.

Material examined: Israel: *Shomeron (Samaria)*: 1♂, Nahal Tirza, 12.v.1972, M.P. Pener & Y. Ayal; *Judean Hills*: 1♂, 'En Se'adim, 8.vi.1962, P. Amitai; 1♀, Ma'ale haHamisha, J. Wahrman; 1♂, Nahal Dolev, 8.v.1962, M. Raab; 1♀, Qiryat Ye'arim, 15.v.2022, A. More Yossef; 2♀, 3♀, Jerusalem, 21.vii.1921, J. Wahrman; 1♀, Jerusalem, 24.vii.1957, J. Wahrman; 1♀, Jerusalem, 22.vii.1963, P.

Amitai; 2♂, Jerusalem, 9.vii.1964, P. Amitai; 4♂, 1♀, Jerusalem, 13.vii.1964, J. Wahrman; 2♂, Jerusalem, 1.vii.1965, P. Amitai; 1♀, Jerusalem, 28.vii.1965, P. Amitai; 2♀, Jerusalem, 2.vii.1966; 4♂, Jerusalem, 11.vii.1966; 1♂, 1♀, Jerusalem, 13.vii.1966; 1♂, 1♀, Jerusalem, 15.vii.1966; 1♂, Jerusalem, 17.vii.1966; 1♂, 1♀, Jerusalem, 20.vii.1966; 3♂, Jerusalem, 21.vii.1966; 3♂, Jerusalem, 26.vii.1966; 1♂, Jerusalem, 31.vii.1967, M.P. Pener & P. Amitai; 1♂, Jerusalem, 20.vi.1971, J. Wahrman; 5♀, Jerusalem,

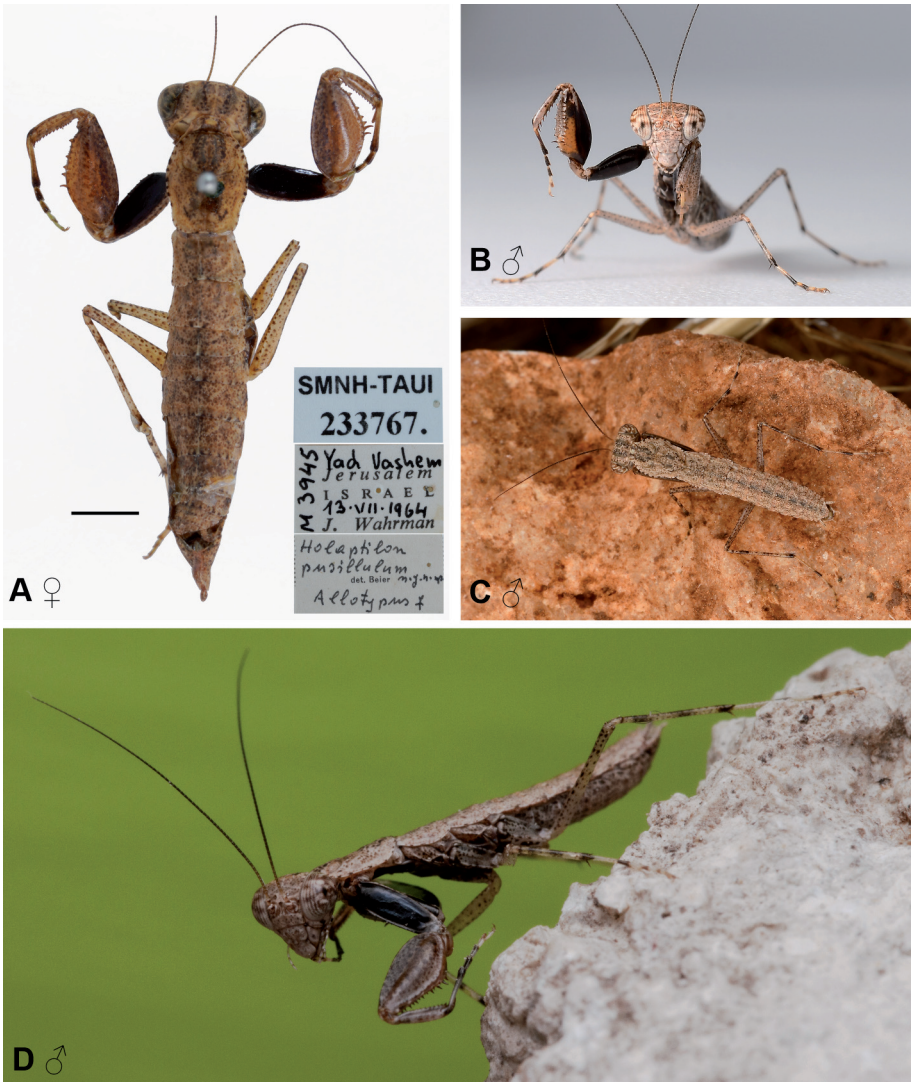


Fig. 17. *Holaptilon pusillulum*: (A) paratype ♀, habitus, dorsal view (SMNHTAU); (B) ♀ habitus, frontal view, photo by Avi More Yossef; (C) ♂ live, habitus, dorsal view, photo by Avi More Yossef; (D) ♂ live, habitus, lateral, photo by Yaakov Salaviz.

28.vi.1971, J. Wahrman; 2♀, Jerusalem, 3.vii.1971, J. Wahrman; 6♀, Jerusalem, 7.vii.1971, J. Wahrman; 1♀, Jerusalem, 8.vii.1971, J. Wahrman; 2♀, Jerusalem, 13.vii.1971, J. Wahrman; 1♂, Jerusalem, 17.vii.1971, J. Wahrman; 1♂, 2♀, Jerusalem, 21.vii.1971, J. Wahrman; 1♀, Jerusalem, 22.vii.1971, J. Wahrman; 2♀, Jerusalem, 18.viii.1971, J. Wahrman; 1♀, Jerusalem, 5.vi.1972, J. Wahrman; 1♂, Jerusalem, 11.vi.1972, J. Wahrman; 6♀, Jerusalem, 12.vi.1972, J. Wahrman; 2♀, Jerusalem, 13.vi.1972, J. Wahrman; 2♀, Jerusalem, 14.vi.1972, J. Wahrman; 1♀, Jerusalem, 16.vi.1972, J. Wahrman; 4♀, 2♀, Jerusalem, 25.vi.1972, J. Wahrman; 1♀, Jerusalem, 9.vii.1972, J. Wahrman; 1♀, Jerusalem, 21.vii.1972, J. Wahrman; 2♀, Jerusalem, 22.vii.1972, J. Wahrman; 1♀, Jerusalem, 27.vii.1972, J. Wahrman; 1♀, Jerusalem, 2.vii.1973, J. Wahrman; 1♀, Jerusalem, 23.vii.1973, J. Wahrman; 1♂, Jerusalem, 12.vii.1974, J. Wahrman; 1♀, Jerusalem, 1.viii.1974, J. Wahrman; 1♀, Jerusalem, 10.viii.1974, J. Wahrman; 1♀, Jerusalem, 17.viii.1974, J. Wahrman; 1♀, Jerusalem, 26.viii.1974, J. Wahrman; 1♂, Jerusalem, J. Wahrman; *Central Negev*: 1♂, 1♀, Bor Hemet, 28.vii.1992, D. Rauscher; 1♀, Nahal Nafha, 18.viii.1957, J. Wahrman (all SMNHTAU).

General distribution: Israel (type locality), Jordan.

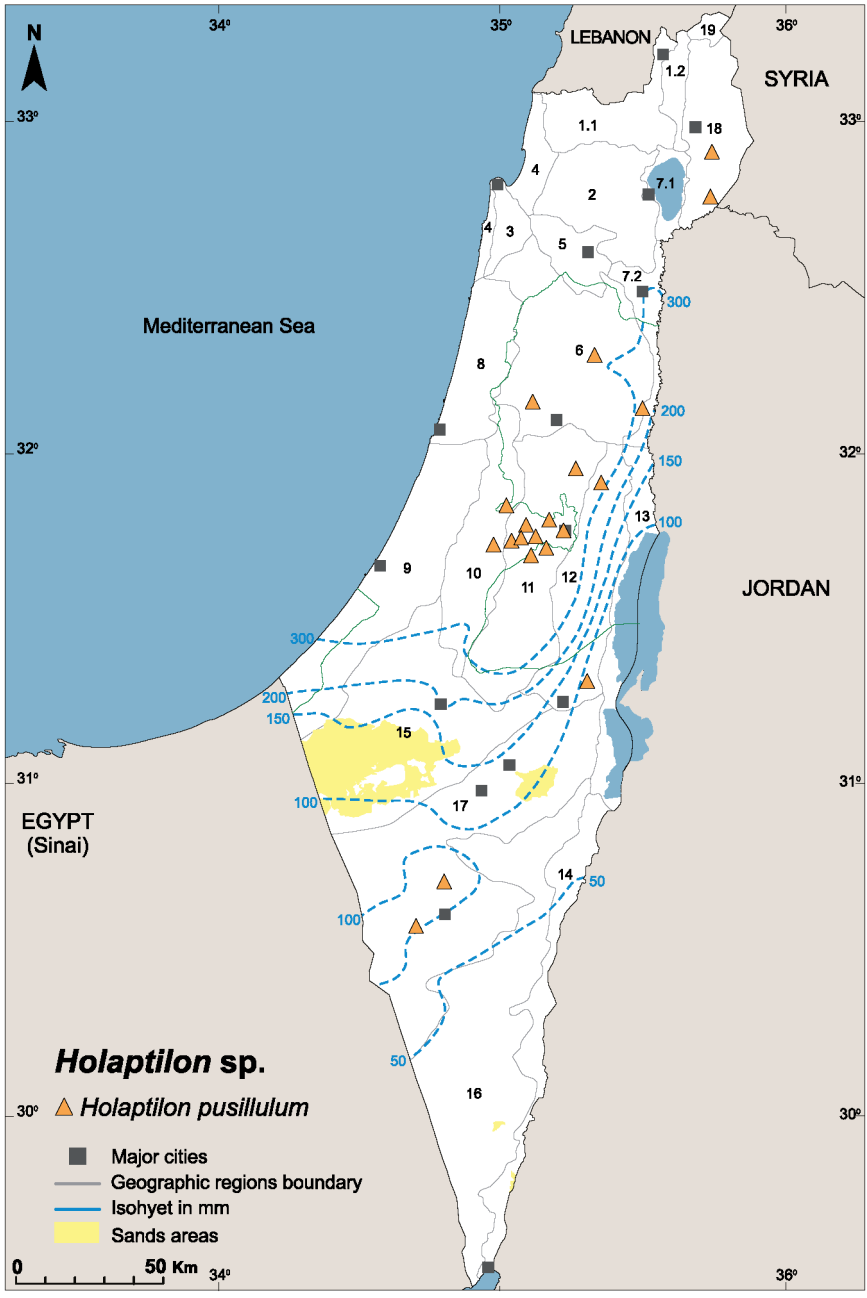
Records in Israel: Central Negev, Golan Heights, Judean Foothills, Judean Hills, Judean Desert, Shomeron (Samaria).

Biological notes: The species inhabits shrubland and steppe in several different biogeographical regions: Mediterranean garrigue (Fig. 66A) in the Judean Hills and Samaria (alt. 600–800 m); the Judean Desert (4.vi.1972, Horbat Goren, 7 km east of 'Arad, alt. 380 m, HUJI); and desert shrub-steppes of the high Negev desert (alt. 700–800 m). Two new records from the Golan Heights have expanded the known distribution beyond that of its previous documentation from Israel: a nymph collected near Mezar (alt. ~350 m), in the southern Golan Heights (ix.1987, leg. Amizur Boldo, HUJI) and an adult female near Gamla (alt. ~300 m), on a walking trail (xii.2022, Eldad Chausu Linoy, pers. comm.; https://www.facebook.com/photo/?fbid=8496488437088412).

The smallest mantid known from Israel. Adults apterous. A ground-dwelling, fast-moving mantid, with antennae vibrating rapidly and continuously. Seen active in daylight (early morning and midday) on the bare ground and on stones. Field evidence points to climbing abilities – seen once on a tree trunk and on a rock face. Found also under loose stones, possibly used as shelters. Usually seen near subshrubs (e.g. *Sarcopoterium spinosum* (L.) Spach (Rosaceae) and *Coridothymus capitatus* (L.) Hoffmanns. & Link (Lamiaceae)) or trees. When disturbed, it usually escapes down quickly and hides in the spiny and thorny gray bushes, and, therefore, it is difficult to see and catch; sometimes it has been observed standing on the small stones (Abu-Dannoun 2006). In captivity prays on very small insects (Amitai & Simon 1985).

The ootheca is deposited (in captivity) into shallow depressions underneath stones; length: ~5.5 mm (Rauscher, in litt.).

One adult female, collected on June 2021 by Avi More Yossef, deposited two oothecae in captivity; one of them on a stem (Fig. 69B). The first ootheca (June 2021) comprised 12 egg chambers, the second (August 2021) comprised 14 egg chambers. Wahrman (in litt., August 1954) and Mirzaee *et al.* (2022) noted that an ootheca can hold about 15 eggs.



Map 4. *Holaptilon pusillulum*, distribution in Israel.

Conservation: Endangered. *H. pusillulum* is elusive, very hard to find due to its small size and cryptic lifestyle. Its patchy distribution is possibly a result of habitat fragmentation.

Superfamily Eremiaphiloidea Saussure, 1869
Family Rivetinidae Ehrmann & Roy, 2002
Subfamily Rivetininae Ehrmann & Roy, 2002
Genus *Rivetina* Berland & Chopard, 1922

Figs 7A, E, 15G–H

אֲצָן

The genus is widespread in the southern Mediterranean region, especially in dry and arid habitats (Battiston *et al.* 2010), and comprises 34 known species (Otte *et al.* 2023). Until the revision of the genus by La Greca & Lombardo (1982), that included the description of *Rivetina byblica* from Israel and Jordan, all earlier works on the matids of the Levant referred only to *Rivetina baetica* Rambur, 1839. However, both Buxton and Uvarov (1923) and Bodenheimer (1925) noted the wide variability in body sizes and differences in pronotum proportions and pointed out the need for a taxonomic revision of those forms. This variation is well reflected not only within species but also in local populations of the same species, which can hinder identification if based on morphology alone.

Mirzaee *et al.* (2023: 276) stated: "External morphology, male genitalia and geographic distribution have traditionally been used to describe and classify mantid species. Nevertheless, high intraspecific variability in male genital characteristics makes it difficult to separate some closely related species. In addition, intraspecific morphological variability is still unknown or poorly documented for numerous species". Variation in the shape of the phalloid apophysis in the local population of at least three species of *Rivetina* in Israel is depicted in Fig. 18.

Bodenheimer (1925) listed several localities for *Rivetina baetica*; most are from the center and north of Israel (Mediterranean region), only a few from the east (Jordan Valley, Judean Desert) and none from the south (Negev). He reported that the male elytra are a little shorter than the edge of the abdomen (Fig. 15H). Considering this, together with the geographic records, we note that Bodenheimer's data match *R. byblica* rather than *R. baetica*. La Greca & Lombardo (1982) appear to have ignored the occurrence of *Rivetina baetica* in Israel. In this study, we also add a third species that we associate with the *Rivetina* '*balcanica*' complex.

The genus *Rivetina* includes xerothermophilous species which, in the Mediterranean basin, are found along the coasts and in Asia in the sub-desert and steppe areas (La Greca & Lombardo 1982). Bodenheimer (1935*c*) stated: "Die Aktivität der meist am bloßen Boden in der prallen Sonne laufenden Tiere hat ihr Optimum bei 22-30°C, besonders bei 25°C" [The activity of the animals, which mostly walk on the bare ground in the blazing sun, has its optimum at 22–30°C, especially at 25°C].

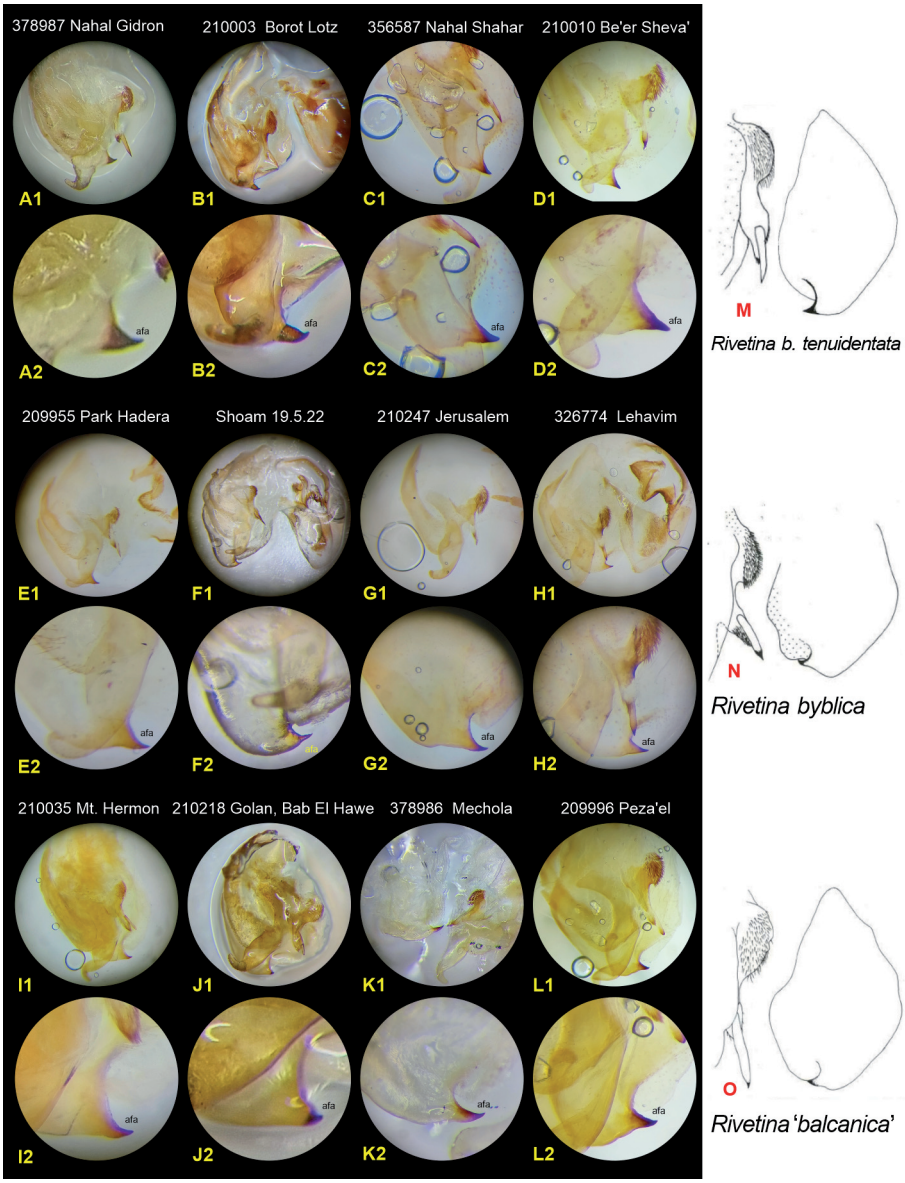


Fig. 18. *Rivetina* spp., male genitalia: (A–D) *Rivetina baetica tenuidentata*; (E–H) *Rivetina byblica* complex; (I, J) *Rivetina* '*balcanica*' complex; (K, L) *Rivetina* nr. '*balcanica*'; (M–O) *Rivetina* spp. male genitalia images from La Greca & Lombardo (1982): (M) *R. b. tenuidentata*; (N) *Rivetina byblica*; (O) *R.* '*balcanica*'. Abbreviations: (afa) – anterior lobe of phalloid apophysis.

This description seems to match all three local species. The most xerothermophilic species is *Rivetina baetica tenuidentata* La Greca & Lombardo, 1982, which is found in various arid areas in the Negev and the 'Arava Valley. *Rivetina byblica* is common in natural habitats in most of the local Mediterranean regions, from south to north. The *Rivetina* '*balcanica*' complex is limited in Israel to the central and north of the Golan Heights and to Mt Hermon. The distribution overlap between the species is unclear.

Male macropterous, female brachypterous. The ootheca (length 9.5–17.5 mm, n=6) (Rauscher, in litt.) is deposited in the ground (Fig. 68A, B), in a low depression (~10 mm, in the lab) (Rauscher, in litt.) that the female digs with her two ventral spikes, located at the end of the 7th abdominal sternite (Fig. 15F). After deposition, the female fills up the pit with the help of her rear walking legs. The first instars are ground-dwellers. Last instars and adults are active on the ground, in low grass or shrubs. Large nymphs and adults were seen lurking for prey at night, on shrubs and large bushes.

Rivetina baetica tenuidentata La Greca & Lombardo, 1982

Figs 15M, N, 19A–E, 60A, B, Map 5

אָצָן מִדְבָּרִי

Body length: ♂ 53.0–64.0 mm, ♀ 43.0–57.0 mm.

Material examined: Israel: *Northern Negev*: 1♂, Be'er Milka, N. Michaeli; 1♀, Mash'abbe Sade, 5.vii.1950, M. Sternlicht; 1♀, Mash'abbe Sade, 23.ix.1955, L. Fishelsohn; 1♀, Mash'abbe Sade, 10.ix.1958, A. Shulov; 2♂, Mash'abbe Sade, 28.viii.1965, J. Wahrman; 3♂, Mash'abbe Sade, 25.vi.2020, A. Weinstein; 8♂, 1♀, Nahal Shahar, 25.vi.2020, A. Weinstein; 1♂, 1♀, Nahal Shahar, 25.vi.2020, D. Simon; 1♂, Ne'ot Hovav, 25.vi.2020, A. Weinstein; 1♂, Ne'ot Hovav, 26.vi.2020, A. Weinstein; 1♂, Telalim, 8.viii.1988, E. Shney-Dor; 1♀, Telalim, 7.vi.2015, A. Weinstein; 1♀, Zomet haNegev, 5.vi.2020, A. More Yossef; 1♂, Zomet haNegev, 19.vi.2020, A. More Yossef; *Central Negev*: 1♀, 3♀, 'Avedat, 8.ix.1957, Y. Werner; 1♂, Be'er Hagar, 29.vi.1919, H. Bytinski-Salz; 6♂, Borot Loz, 27.vii.1992, D. Rauscher; 1♂, Borot Loz, 1♂, Helmoniyyot Yeroham, 25.vi.2020, A. Weinstein; 1♂, 3♀, Horbat Mamshit, 1.viii.2020, A. More Yossef; 1♀, Mishor Yamin, 30.vii.1952, J. Wahrman; 1♀, Nahal Zin, 18.viii.1957, J. Wahrman; 1♀, Sede Boqer, 6.x.2015, A. Weinstein; 1♀, Tel Yeroham, 18.vii.1955, M.P. Pener ; 1♂, Tel Yeroham, 28.vi.1959, J. Krystal; 1♀, Yeroham, 20.ix.1955, L. Fishelsohn; 1♀, Yeroham, 1.x.2018, A. Weinstein; 1♂, HaMeshar, 7.vii.2020, A. Weinstein; 1♂, Nahal Gidron, 25.v.2021, A. Weinstein; 1♂, Nahal Gidron, 11.ix.2021, D. Margalit; 1♂, Nahal Shitta, 26.vii.2017, A. Weinstein; 1♂, Nahal Shitta, 27.vii.2017, A. Weinstein; *Southern Negev*: 3♂, 1♀, Nahal Shitta, 7.vii.2020, A. Weinstein; 1♂, Ne'ot Semadar, 22.vii.2018, A. Weinstein; 1♂, Hazeva, 21.ix.2022, D. Margalit; *'Arava Valley*: 1♀, Nahal Hayyon, 15.viii.2020, A. Weinstein (all SMNHTAU).

General distribution: Algeria, Chad, Egypt, Israel, Italy (type locality, Sicily), Libya, Malta, Mauritania, Morocco, Senegal, Tunisia.

Records in Israel: Central Negev, Northern Negev, Southern Negev, 'Arava Valley.

Biological notes: Widespread throughout the Negev, abundant on wadi banks (Fig. 67B), even in very small and shallow-flow dry ravines, as long as there is vegetation, even low grass.

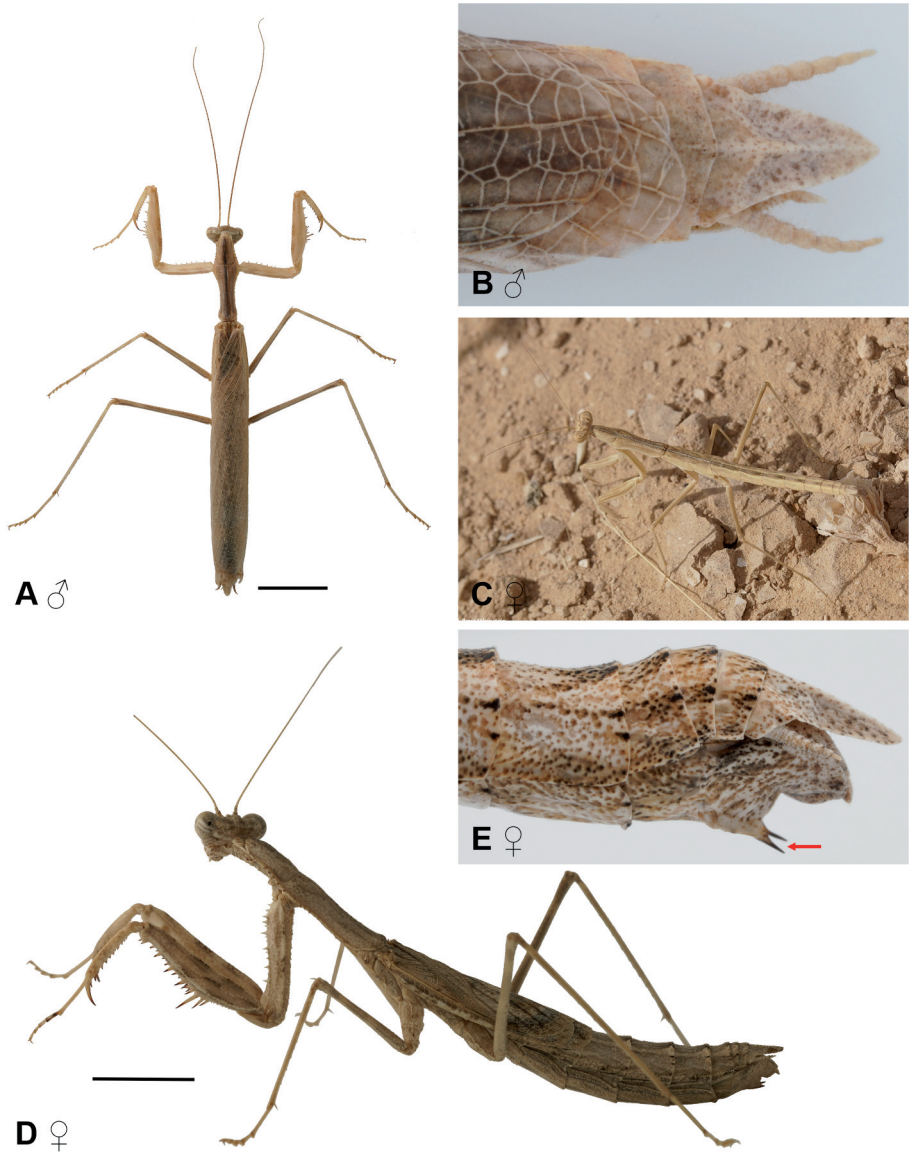


Fig. 19. *Rivetina baetica tenuidentata*: (A) Nahal Shahar., 25.vi. 2020, ♂ habitus; (B) ♂ supra-anal plate; (C) Mash'abbe Sade, 7.vi.2015, nymph live, habitus; (D) Agam Yeroham, 1.x.2018, ♀ live, habitus, lateral view; (E) ♀ posterior part of abdomen; scale bar = 10 mm.

Conservation: Least concern. Common in natural habitats in its areas of occurrence.

Notes: La Greca & Lombardo (1982) recognized two subspecies: *Rivetina baetica baetica* Rambur, 1839 (Iberian Peninsula) and *Rivetina baetica tenuidentata* La Greca & Lombardo, 1982 (throughout North Africa).

The northern limit of distribution is unclear; specimen records indicate up to 15 km south of Be'er Sheva', in the Ne'ot Hovav vicinity. The specimens from Be'er Sheva' seemingly show a character transition between *R. baetica tenuidentata* and *R. byblica* – an issue that requires verification in future studies.

R. baetica tenuidentata can be distinguished morphologically from other *Rivetina* spp. in Israel by the relatively long wings of the males (Figs 15M, 19A), which usually reach over the supra-anal plate; the different genitalia; and the relatively short pronotum (Figs 15N, 19A) – the ratio between the length of the metazone and its minimum width (RM) is normally less than 4: ♂ RM 3.35–4.22 (n=9), ♀ RM 2.93–3.71 (n=6) (Fig. 20) and finely toothed pronotum, mostly in the male.

The key for *Rivetina* spp. in this work refers only to males of species recorded herein. The average RM of *R. baetica tenuidentata* females and *R.* '*balcanica*' females is 3.93 and 3.39, respectively, in contrast to RM of 4.09 in *R. byblica*. Consequently, identification of the females of the first two species based only on RM is not practical for our key to species.

Rivetina byblica La Greca & Lombardo, 1982

Figs 15J, K–L, 21A–F, 70H, Map 5

אָצַן יָם־תֵּיכוֹנִי

Body length: ♂ 42.0–76.0 mm, ♀ 49.0–70.0 mm.

Material examined: Israel: *Golan Heights*: 1♂, Nahal Yarmukh, 15.ix.1945, Y. Palmoni; *Hula and Korazim Block*: 1♂, 1♀, 'Amir, 1.viii.1945, H. Bytinski-Salz; 1♂, Lahavot haBashan, 7.vi.1958, L. Fishelsohn; *Upper Galilee Hills*: 1♀, Asherat, 5.x.1961, M.P. Pener *et al.*; 1♀, Avivim, 2.x.1967, S. Blondheim & Cohen; 1♀, Har Meron, 22.ix.1961, M.P. Pener *et al.*; 1♀, Qiryat Shemona, 7.vi.1958, L. Fishelsohn; 1♀, Rosh haNiqra Nature Reserve, 5.vi.1954, J. Wahrman; *Lower Galilee*: 1♀, Har Tavor Nature Reserve, 21.ix.1961, M.P. Pener *et al.*; 1♀, Har Tavor Nature Reserve, 27.viii.1963, S. Blondheim & J. Margalit; 1♀, Poriyya, 14.iv.1966, S. Blondheim; 1♀, Tur'an (Tir'an), 3.x.1967, S. Blondheim & Cohen; 1♀, Yavne'el, 22.ix.1961, M.P. Pener *et al.*; *Sea of Galilee area*: 1♀, Bitanya, 13.v.1937, Y. Palmoni; 1♂, Deganya A, 13.viii.1941, Y. Palmoni; 2♀, 'En Gev, 20.ix.1954, J. Wahrman; 2♀, Menahemya, 4.x.1961, M.P. Pener *et al.*; 1♂, Tel Qazir, 23.vi.1955; 1♂, Tel Qazir, 6.viii.1956, J. Wahrman; 1♀, Teverya (Tiberias), 6.viii.1941, Y. Palmoni; *Northern Coastal Plain*: 1♀, Akhziv, 15.x.1957, J. Wahrman; *Karmel (Carmel) Ridge*: 1♀, Haifa (Hefa), 6.vii.1955, J. Wahrman; 1♀, 'Ofer, 4.x.1963, P. Amitai & Poznanski; *Yizre'el (Jezreel) Valley*: 1♂, 'Emeq Yizre'el, 7.vii.1926, F.S. Bodenheimer; 1♀, Hare Gilboa', 2.ix.1943, H. Bytinski-Salz; 1♀, Megiddo, 28.vii.1959, P. Amitai; 1♂, Nahalal, 30.vii.1948, M. Sternlicht; *Jordan Valley*: 1♀, Bet Alfa, 4.x.1964, M.P. Pener *et al.*; 1♀, Gesher, 14.vi.1960, L. Fishelsohn; 1♂, Giv'at Sal'it, 17.viii.2021, Y. Zvik; 1♀, Mehola, 2.viii.2016, Y. Zvik; *Central Coastal Plain*: 1♀, Hadera, 18.ix.1958, P. Amitai; 1♀, Tel Aviv, 1.viii.1976, A. Freidberg; 1♂, Tel Aviv, 6.viii.1981, J. Kugler; *Shomeron (Samaria)*: 1♂, Har 'Eval, 29.viii.2018, L. Friedman; 1♀, Nahal 'Iron, 14.vi.1958, L. Fishelsohn; 1♀, Nahal 'Iron, 13.vi.1960, L. Fishelsohn; 1♀, 1♀, Nahal 'Iron, 14.vi.1960, L. Fishelsohn; 1♂, Sa Nur, 10.vii.1967, A. Shulov *et al.*; *Southern Coastal Plain*: 1♂, Ashdod, 15.ix.2022, A. More Yossef; 1♀, Neta'im, 1.vii.1955, Ch. Lewinsohn;

	baetica tenuidentata	*byblica*	*nr. byblica*	*'balcanica'*	*nr.'balcanica'*
♀♀	n=6	n=39	n=3	n=10	n=9
L. body	46-57 (μ=49.57)	37-70 (μ=55)	51-64 (μ=59.07)	47-67 (μ=57.75)	50.5-85.5 (μ=59.35)
L. pronotum	35-17.24 (μ=15.44)	10.88-21.8 (μ=16.74)	16.74-19.97 (μ=18.83)	14.03-19.93 (μ=16.76)	14.61-18.43 (μ=16,47)
RM	2.93-3.71 (μ=3.93)	3.09-5.15 (μ=4.09)	5.56-5.76 (μ=5.7)	3.22-3.73 (μ=3.39)	3.23-3.83 (μ=3.48)
L. elytra (top)	15.11-21.06 (μ=18.19)	11.55-20.9 (μ=15.87)	11.63-14.27 (μ=13.3)	14.23-18.73 (μ=16.55)	15.36-21.43 (μ=18.52)
♂♂	n=9	n=26	n=4	n=6	n=4
L. body	49.5-64 (μ=56.32)	42-76 (μ=56.63)	52.50-59 (μ=55.58)	46.5-64 (μ=52.58)	58.6-85.57 (μ=64.30)
L. pronotum	12.32-15.95 (μ=13.81)	10.28-19.67 (μ=14.12)	14.27-16.6 (μ=15.39)	12.4-15.66 (μ=13,7)	14.16-17.07 (μ=16,31)
RM	3.35-4.22 (μ=3.87)	3.46-5.58 (μ=4.53)	6.26-7.01 (μ=6.72)	3.3-3.93 (μ=3.61)	4.16-4.48 (μ=4.27)
L. elytra (top)	33.36-43 (μ=38.18)	26.76-45.82 (μ=35.24)	28.26-31.6 (μ=29.61)	24.39-32.9 (μ=27.5)	34.68-42 (μ=39.08)

RM = Ratio between the length of the metazone and its minimum width

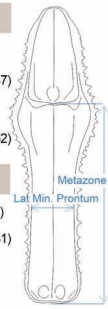


Fig. 20. Comparative table of measurements of *Rivetina* spp. from SMNHTAU. Values are in mm**.**

1♂, Neta'im, 10.ix.1956, Ch. Lewinsohn; 1♂, Nizzanim, 10.vi.2010, A. Konstantinovsky; 1♂, Qiryat 'Eqron, 31.vii.1941, H. Bytinski-Salz; *Judean Foothills*: 1♀, Lahav, 8.viii.1959, P. Amitai; 1♀, Lahav, 19.vii.1961, D. Freund; 1♀, Lahav, 19.viii.1961, D. Freund; 1♂, Lahav, 17.viii.1966, G. Tsabaer; 1♀, Lahav Nature Reserve, 15.vii.2022, A. More Yossef; 1♀, Shoham Forest Park, 26.iv.2008, E. Scemama; 1♀, Shoham Forest Park, 15.vii.2020, T. Simon; 1♂, 4♀, Shoham Forest Park, 19.v.2022, A. Weinstein; 1♂, Shoham Forest Park, 19.v.2022, D. Simon; *Judean Hills*: 1♂, Birzeit, 13.viii.1969, M. Broza *et al.*; 1♂, Giv'at Ye'arim, 10.vi.2021, A. More Yossef; 1♀, Nahal Soreq, 28.viii.1949, J. Wahrman; 1♀, Qiryat 'Anavim, 7.vii.1952, S. Amitai; 1♀, Qiryat 'Anavim, 1♀, Jerusalem, 31.vii.1939, H. Bytinski-Salz; 1♀, Jerusalem, 1.ix.1941, H. Bytinski-Salz; 1♀, Jerusalem, 6.vii.1949, J. Wahrman; 1♂, 1♀, Jerusalem, 9.vii.1949, J. Wahrman; 1♂, 1♀, Jerusalem, 19.vii.1949, J. Wahrman; 1♂, 1♀, Jerusalem, 23.vii.1949, J. Wahrman; 3♀, Jerusalem, 30.vii.1949, J. Wahrman; 1♀, Jerusalem, 4.viii.1949, J. Wahrman; 1♀, Jerusalem, 6.viii.1949, J. Wahrman; 2♂, Jerusalem, 8.viii.1949, A. Zehavi; 1♀, Jerusalem, 20.viii.1949, J. Wahrman; 1♂, 5♀, Jerusalem, 28.viii.1949, J. Wahrman; 1♂, Jerusalem, 6.ix.1949, J. Wahrman; 1♀, Jerusalem, 1.viii.1950, J. Halperin; 1♀, Jerusalem, 20.vii.1954, J. Wahrman; 1♂, Jerusalem, 31.viii.1957, S. Slavin; 1♀, Jerusalem, 30.ix.1957, R. Falk; 1♂, Jerusalem, 1.vii.1958, J. Halperin; 1♂, Jerusalem, 14.viii.1958, Y. Werner; 2♀, 2♀, Jerusalem, 18.viii.1958, Fatal; 2♂, Jerusalem, 22.viii.1958, Y. Werner; 1♂, Jerusalem, 27.viii.1959, J. Wahrman; 1♂, Jerusalem, 29.viii.1964, S. Blondheim; 1♀, Jerusalem, 22.iv.1965, S. Blondheim; 1♀, Jerusalem, 16.viii.1965, Gabby; 1♂, Jerusalem, 17.ix.1965, J. Wahrman; 1♀, Jerusalem, 8.xi.1965, S. Blondheim; 2♂, Jerusalem, 31.vii.1967, S. Blondheim *et al.*; 1♀, Jerusalem, 25.x.1967, S. Blondheim; 2♀, Jerusalem, J. Halperin; 2♀, Jerusalem, 2♂, Jerusalem, *Judean Desert*: 1♂, 1♀, 'Arad, 4.vi.1963, M.P. Pener & S. Blondheim; 1♀, 3♀, 'Arad, 9.vi.1966, Faunistics; 1♂, 'Arad, 28.vi.1969, Beit Shturman; 1♀, 'Arad, 21.v.1970, Faunistics; *Northern Negev*: 1♀, Be'er Sheva', 15.v.1955, A. Weissman; 1♂, Be'er Sheva', 3.vii.1955, M.P. Pener ; 1♀, Be'er Sheva', 14.vi.1956, Gabby; 1♂, Be'er Sheva', 2.viii.1958; 1♀, Berosh, 9.vi.1966, Faunistics; 3♀, Devira, 7.viii.1962, Y. Levy; 1♂, Gevulot, 14.vi.1986, E. Shney-Dor; 1♀, Ze'elim, 12.vii.1961, P. Amitai; 1♂, Ze'elim, 23.viii.1992, Y. Zvik (all SMNHTAU).

Lower Galilee: 1♀, Nazerat (Nazareth), 30.vi.1921, P.A. Buxton; *Jordan Valley*: 1♂, Bet She'an, 18.vi.1958; *Central Coastal Plain*: 2♂, Hadera, 10.vi.1930, Y. Tapukhi; 1♂, Hadera, 20.vi.1930, Y. Tapukhi; *Judean Hills*: 1♂, Ben Shemen, 22.vi.1924, F.S Bodenheimer; 1♂, Ben Shemen, 6.vii.1924; 1♂, Ben Shemen, 23.vi.1925, F.S. Bodenheimer; 3♀, Ben Shemen, 17.vi.1926, F.S. Bodenheimer (all PPIS).

Sea of Galilee area: 1♀, Huqoq, 30.xi.1957 (OQT).

Rivetina nr. *byblica*: *Central Coastal Plain*: 1♂, Berekhat Hadera Nature Reserve, 2.viii.1991, A. Shlagman; 1ex., Binyamina, 9.vii.1958, J. Krystal; 1♂, Hadassim, 1.ix.1953; 1♂, Netanya, 10.vii.1963, S. Blondheim & J. Margalit; 1♀, Netanya, 13.xi.1967, S. Blondheim; 1♂, 1♀, Qesarya, 16.viii.1954, L. Fishelsohn; 1♀, Zofit, 29.vii.1955, M. Dor (SMNHTAU).

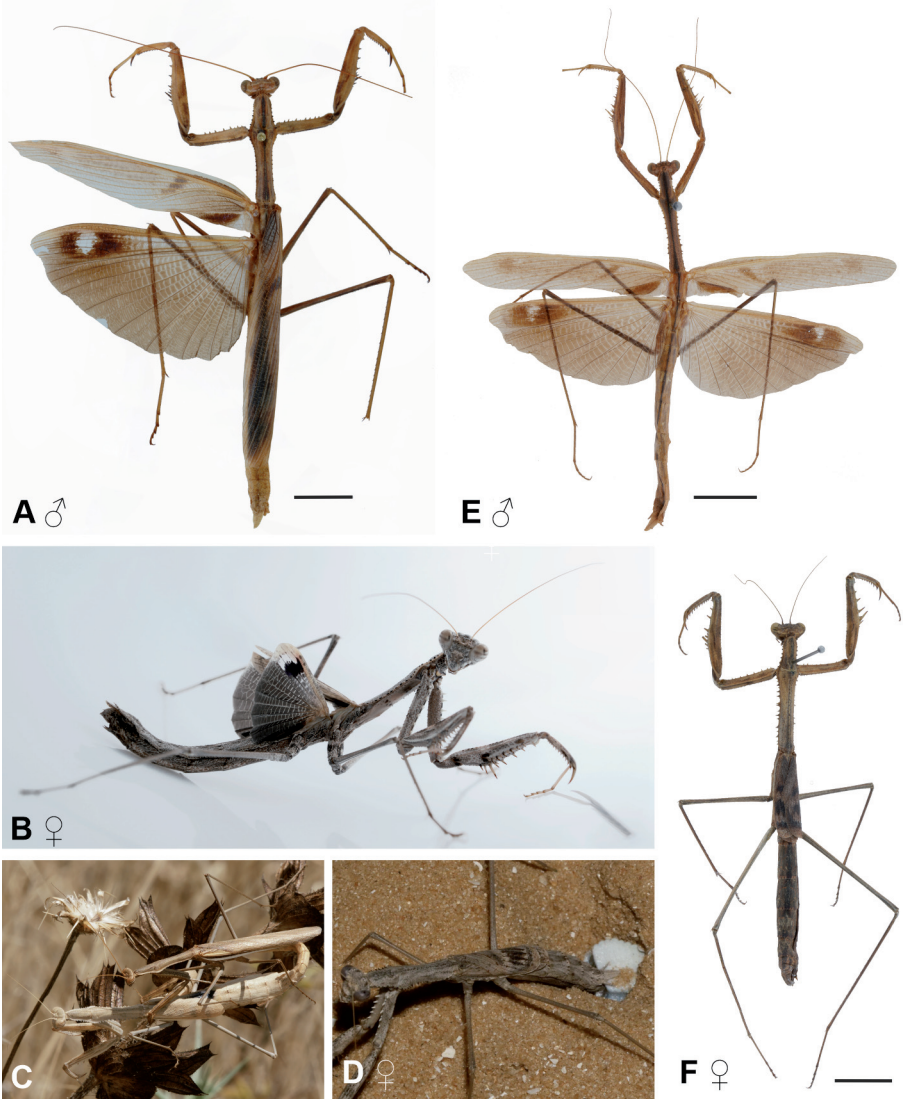


Fig. 21. (A–D) *Rivetina byblica*: (A) 209942, Tel Qazir, 23.vi.1955, ♂ habitus, dorsal view; (B) Shoham Park, 15.vii.2020, ♀ live, habitus, deimatic display; (C) Shoham Park, 11.vi.2011, copulating pair; (D) Yavne, ix.2017, ♀ live, oviposition, photo by Eran Tsukerman; (E, F) *Rivetina* nr. *byblica* aff. *caucasica turcica*: (E) 209994, Netanya, 10.vii.1963, ♂ habitus, dorsal view; (F) 209905, Netanya, 13.xi.1967, ♀ habitus, dorsal view; scale bar = 10 mm.

General distribution: Israel, Jordan (type locality), Lebanon (? https:// inaturalist.org/observations/176086610), Syria.

Records in Israel: Central Coastal Plain, Golan Heights, Hula and Korazim Block, Jordan Valley, Judean Desert, Judean Foothills, Judean Hills, Karmel (Carmel) Ridge, Lower Galilee, Northern Coastal Plain, Northern Negev, Sea of Galilee area, Shomeron (Samaria), Southern Coastal Plain, Upper Galilee Hills, Yizre'el (Jezreel) Valley.

Biological notes: The species is found in herbaceous garrigue and steppe habitats (Fig. 66E) and in vegetation-rich sandy habitats, from the Northern Negev throughout the Center of Israel and along the Central Coastal Plain in the west to the Jordan Valley in the east and to the north of the Mediterranean region in the Upper Galilee Hills.

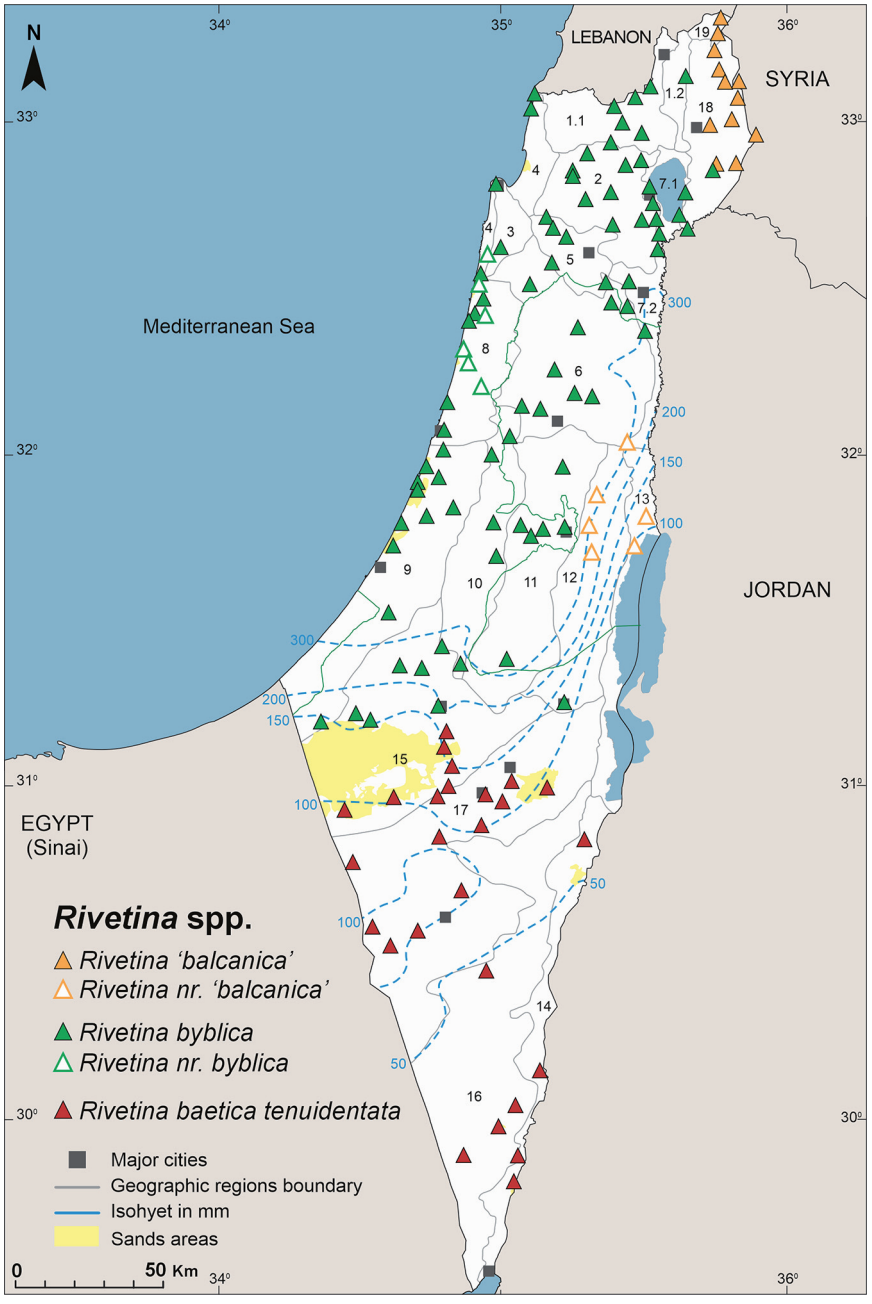
Conservation: Least concern. Common, but with discontinuous distribution and localized in the natural habitats in its areas of occurrence.

Notes: *Rivetina byblica* description is based on specimens from: Jordan (Wadi Shu'ayb), 2♂; Israel (Dead Sea area), 1♂; Syria (Aleppo), 2♂, 1♀ (La Greca & Lombardo 1982).

Of about 270 *Rivetina* spp. adult specimens in the SMNHTAU collection, 65 (26♂, 39♀) were measured and fit into the *byblica* characters' frame as presented in La Greca & Lombardo (1982). In total, about 140 adult specimens (of the 270 *Rivetina* spp.) were found to be *R. byblica*. There is a considerable variability in body size, body proportions and genitalia morphology among specimens (of the same sex). Therefore, in this study, we consider all the examined specimens that fit the *byblica* characters as belonging to the *R. byblica* complex. The status of the species should be reconsidered in future studies as part of a revision of the genus.

In the Sharon Plain (Central Coastal Plain) there is a unique population (*Rivetina* nr. *byblica*, Map 5) that differs from the typical *Rivetina byblica* habitus by a relatively much longer, narrower and strongly toothed pronotum (Fig. 15J, L). The ratio between the length of the metazone and its minimum width: ♂ RM 6.26–7.01 (n=4), ♀ RM 5.56–5.76 (n=3) (Fig. 20) and the female differs in the relatively very short wings (not reaching the 2nd abdominal tergite). Following Ramme (1951) and La Greca & Lombardo (1982), these specimens' habitus show an affinity to that of *Rivetina caucasica turcica* Ramme, 1951. Due to the physical condition of the specimens, we were able to examine only one male's genitalia, which showed high similarity to the *R. byblica* complex. Most of the specimens (n=8) were collected in the 1950s and 1960s. This area has been subject to intensive urban development during the last 70 years. The exact collection localities are not fully clear and the status of these mantid populations is currently unknown.

The *Rivetina byblica* complex can be typically distinguished morphologically from other *Rivetina* spp. in Israel by the shorter wings of the males (Figs 15J, 21A), not reaching the 7th–10th abdominal tergites; slender body of both sexes;



Map 5. *Rivetina* spp., distribution in Israel.

relatively longer and narrower pronotum (Fig. 15K, 15L,), the ratio between the length of the metazone and its minimum width: ♂ RM 3.46–5.58 (n=26), ♀ RM 3.09–5.15 (n=39) (typically >4 in both sexes) (Fig. 20); toothed pronotum (mostly in the female); different genitalia (Figs E–H, N).

Rivetina '*balcanica*'

Figs 15O, P–Q, 22A–F, Map 5

אָצַן הַגּוֹלָן

Body length: ♂ 46.5–67.0 mm, ♀ 41.5–85.0 mm.

Material examined: Israel: *Mount Hermon*: 1♀, Mt Hermon, 20.viii.1967, Nizan; 1♂, 1♀, Mt Hermon, 10.viii.1970, S. Blondheim *et al.*; 1♂, Mt Hermon, 10.viii.1970, S. Blondheim & M. Broza; 1♂, Mt Hermon, 11.viii.1971, K. Yefenof; 1♀3♀, Mt Hermon, 18.vii.1972, J. Kugler; 1♂, Mt Hermon, 12.viii.2013, D. Simon; 1♀, Mt Hermon, 11.viii.2016, Y. Zvik; 1♂, Mt Hermon, 23.vi.2017, I. Armiach; 3♂, 1♀, Mt Hermon, 4.viii.2018, A. Weinstein; 1♀, Mt Hermon, 22.vii.2020, Gegen L.; 1♀, Mt Hermon, 16.viii.2021, A. Weinstein; 1♀, Mt Hermon, 16.viii.2021, D. Simon; 1♀, Majdal Shams, 7.viii.1969, M. Broza *et al.*; *Golan Heights*: 1♂, 3♀, Allone haBashan, 18.vii.1967, M.P. Pener *et al.*; 2♂, 2♀, Berekhat Bar'on, 14.vii.1967, M.P. Pener *et al.*; 1♀, Berekhat Ram, 17.vii.1967, S. Blondheim *et al.*; 1♂, Berekhat Ram, 17.vii.1967, S. Blondheim; 1♂, 1♀, 'Enot 'Eden, 15.vii.1967, M.P. Pener *et al.*; 1♂, Horbat 'Enot Hogla, 17.vii.1967, S. Blondheim; 2♂, Hushniyya, 15.vii.1967, M.P. Pener *et al.*; 3♀, Moumsyie, 18.vii.1967, S. Blondheim *et al.*; 1♂1♀, Moumsyie, 18.vii.1967, S. Blondheim; 1♀, Quneitra, 14.vii.1967, M.P. Pener *et al.*; 1♂, Quneitra, 15.vii.1967, M.P. Pener *et al.*; 1♀, Quneitra, 18.vii.1967, S. Blondheim *et al.*; 1♂, Rafid, 15.vii.1967, M.P. Pener *et al.*; 1♀, Ramat haGolan, 1.vii.1991, Y. Zvik; 1♂, 2♀, Tel Kulyie, 15.vii.1967, M.P. Pener *et al.*; 1♂, Tel Saki, 18.vii.1967, S. Blondheim *et al.*; 2♀, Zomet Rafid, 15.vii.1967, M.P. Pener *et al.*; 1♀, Zomet Rafid, 18.vii.1967, S. Blondheim *et al.* (all SMNHTAU).

Golan Heights: 2♂, 1♀, Mt Avital, 27.vii.1977, Ch. Sandler (OQT).

Rivetina nr. '*balcanica*': *Jordan Valley*: 1♂, Peza'el, 10.vii.1967, A. Shulov *et al.*; 2♂, 2♀, Peza'el, 11.vii.1967, M.P. Pener *et al.*; *Judean Desert*: 1♀, Ma'ale Adummim, 13.vi.1942; 1♂, Mar Saba, 7.vii.1967, A. Shulov *et al.*; 1♂, 2♀, Nahal Perat, 19.vi.1943, H. Bytinski-Salz; 1♀, Nahal Perat, 20.vii.2016, A. Weinstein; *Dead Sea Area*: 1♀, Deir Hajla, 8.vii.1967, A. Shulov *et al.*; 1♀, 'Enot Zuqim, 7.vii.1967, A. Shulov; 1♀, Mizpe Yeriho, 8.vii.1942, H. Bytinski-Salz; 1♂, 1♀, Mizpe Yeriho, 18.vii.1942, H. Bytinski-Salz (all SMNHTAU).

Dead Sea Area: 1♂, Qalya, 19.vi.1968, M. Broza (OQT).

General distribution: Israel (new record), Greece (including Aegean Islands), Turkey (type locality, Anatolia).

Records in Israel: Golan Heights, Mt Hermon.

Biological notes: In herbaceous steppe areas (Fig. 65F) and shrub landscape of the central and northern Golan Heights (Fig. 65D) and Mt Hermon (Fig. 65A, B). There are no records for the southern Golan Heights, which border the distribution area of *R. byblica*.

Conservation: Least concern. Common but with discontinuous distribution and localized in the natural habitats in its occurrence areas.

Notes: This 'species' was suggested by Kaltenbach (1963) as *Rivetina baetica* forma *balcanica* for the East Mediterranean population of what he considered *R. baetica*. La Greca & Lombardo (1982) raised the status of *R. baetica* f. *balcanica* to the species rank. Ehrmann (2011) considered this species as a *nomen nudum*,

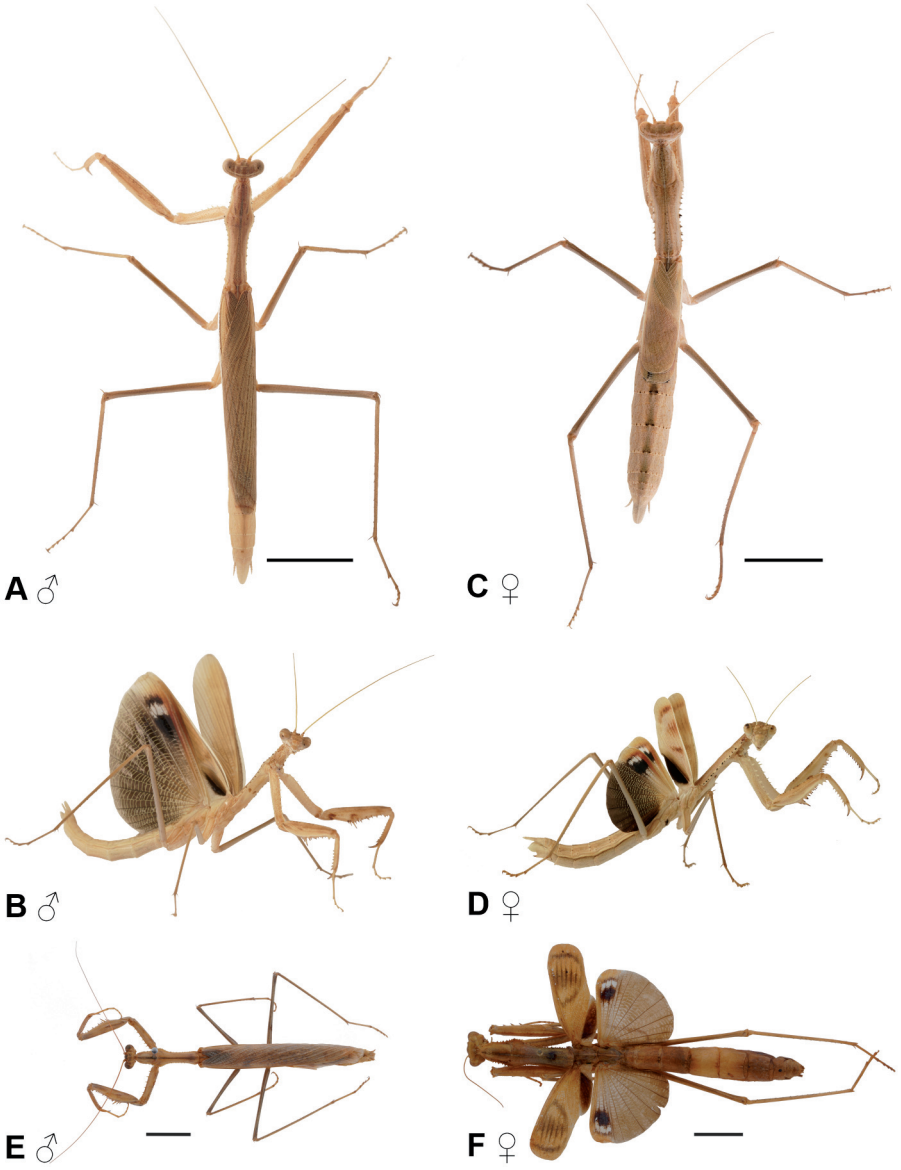


Fig. 22. (A–D) *Rivetina* '*balcanica*': (A) Hermon Nature Reserve, viii.2018, ♂ live, habitus, dorsal view; (B), same data, deimatic display; (C) Hermon Nature Reserve, 27.vii, 2020, ♀ live, habitus; (D) Hermon Nature Reserve, viii.2018, ♀ live habitus, deimatic display; (E, F) *R.* '*balcanica*' complex: (E) 209945, Peza'el, 10.vii.1967, ♂ habitus, dorsal view; (F) 209909, Ma'ale Adummim, 13.vi.1942, ♀ habitus, dorsal view; scale bar = 10 mm.

yet Otte *et al.* (2023) lists it as valid. According to provisions of the Code (ICZN 1999: Art. 15), the name '*balcanica*' is outrightly unavailable for nomenclatural purposes, since it was explicitely proposed after 1960 as infrasubspecific.

Of about 270 *Rivetina* spp. adult specimens in the SMNHTAU collection, 54 (23♂, 32♀) were measured and fit into the '*balcanica*' character frame provided in La Greca & Lombardo (1982). There is a considerable variability in the body size (Fig. 20), body proportions and genitalia morphology among the specimens; this may reflect ecotypes.

Therefore, and in this study, we relate to all the examined specimens that fit the '*balcanica*' character frame as belonging to the *R.* '*balcanica*' complex. The status of this taxon should be reconsidered in the future as part of a thorough revision of the genus.

A second group of *Rivetina* sp. (Fig. 22E, F) shows an affinity to the *R.* '*balcanica*' complex in the genitalia characters, we refer to it as *Rivetina* nr. '*balcanica*'. This group differs in the wings of the males that reach the 7th–9th abdominal tergites and in the ratio between the length of the metazone and its minimum width, which exceeds 4 in males (Fig. 22E), ♂ RM 4.16–4.48 (n=4), ♀ RM 3.23–3.83 (n=9) (Fig. 20). The *Rivetina* nr. '*balcanica*' population borders *R. byblica* (Map 5), but differs from the latter by genitalic characters and the robust body of both sexes. The records of *Rivetina* nr. '*balcanica*' are limited to area in the southern Jordan Valley and north of the Dead Sea. The females of both populations are similar and difficult to separate morphologically. Between Jordan Valley population and the population of the southern Golan Heights, along the northern part of the Jordan Valley, the records indicate only *R. byblica*.

The *Rivetina* '*balcanica*' complex can be distinguished morphologically from other *Rivetina* spp. of Israel by the relatively short wings of the male (Figs15O, 22A) (which do not reach the 5th–6th abdominal tergites) and different genitalia, robust body of both sexes and relatively short pronotum (Fig. 15P, Q) – ratio between the length of the metazone and its minimum width not more than 4: ♂ RM 3.3–3.93 (n=6), ♀ RM 3.22–3.73 (n=10) and strong finely-toothed pronotum (mostly in the female).

Genus *Microthespis* Werner, 1908

אֲצָן

The genus is widespread from East Africa throughout the Arabian Peninsula and southwest to Iran (Battiston *et al.* 2010). Kaltenbach (1982) considers it of the Sahelian-Iranian type of distribution and suggests that the center of distribution for *Microthespis* is in southeastern Iran. All three known species in the genus are known from Pakistan (Panhwar *et al.* 2020). Only one of these is also known from the Levant.

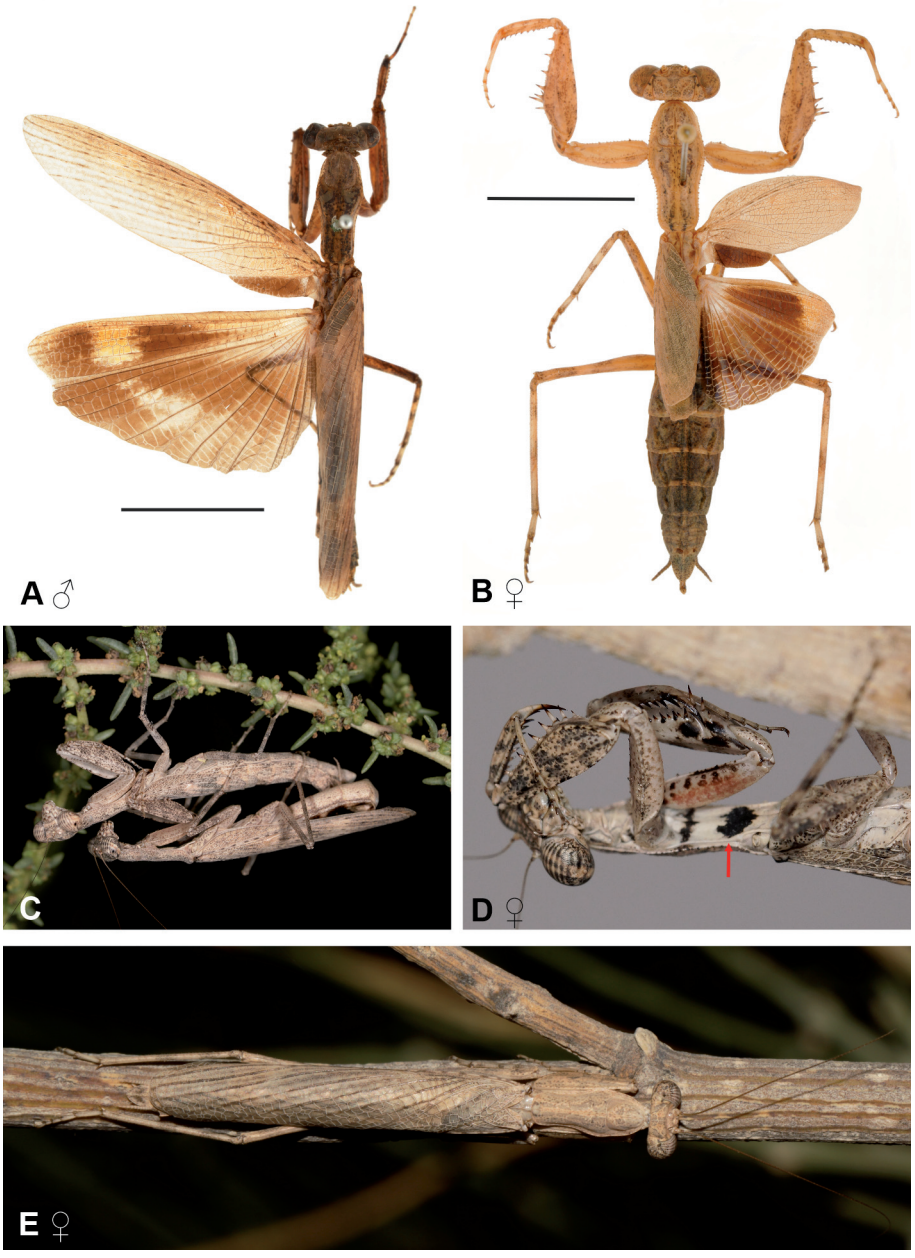


Fig. 23. *Microthespis dmitriewi*: (A) 263612, 'En Gedi, 16.viii.1957, ♂ habitus, dorsal view; (B) 263608, HaMeshar, 1.i.1991, ♀ habitus, dorsal view; (C) 'En Tamar, 10.ix.2020, copulating pair; (D) Yotvata, 30.x.2014, ♀ live, pronotum, ventral, heart-shaped black spot; (E) Western Negev, 3.viii.2013, ♂ live, habitus, camouflage position on a twig, photo by Akiva Topper, scale bar = 10 mm.

Microthespis dmitriewi Werner, 1908

Figs 13A, 23A–E, 69C, Map 6

אָצַן לֵב

Body length: ♂ 27.0–34.0 mm, ♀ 30.0–35.0 mm.

Material examined: Israel: *Judean Desert*: 1♀, Tel Goren, 1.viii.1972, M.P. Pener & Y. Ayal; *Dead Sea Area*: 1♀, 'En Gedi, 16.viii.1957, J. Wahrman; 2♂, 'En Gedi, 16.viii.1957, J. Wahrman; 1♂, 'En Gedi, 30.viii.1960, O. Freund; 1♂, 'En Gedi, 28.x.1960, Friedlander; 1♀, 'En Gedi, 5.v.1961, J. Wahrman; 1♂, 'En Gedi, 5.v.1961, J. Wahrman; 1♂, 'En Gedi Nature Reserve, 24.viii.2017, A. Weinstein; 1♂, 'En Tamar, 22.x.2015, A. Weinstein; 3♂, 'En Tamar, 25.viii.2017, A. Weinstein; 1♂, 'En Tamar, 25.viii.2017, B. Shalmon; 2♂, 'En Tamar, 25.viii.2017, D. Simon; 1♀, 'En Tamar, 26.ix.2017, A. Weinstein; 5♂, 'En Tamar, 26.ix.2017, A. Weinstein; 1♂, 'En Tamar, 26.ix.2017, D. Simon; 1♂, 'En Tamar, 10.ix.2020, A. Weinstein; 1♂, 'Enot Samar, 26.vi.1959, J. Krystal; 1♂, 'Enot Samar, 2.iv.1970, B. Shalmon; 1♂, 'Enot Samar, 17.viii.1971, M. Broza & Y. Ayal; 2♂, Ne'ot haKikkar, 16.vii.1999, I. Yarom & V. Kravchenko; 1♀, Sedom, 17.xi.1966, P. Amitai & G. Tsabar; 1♀, Sedom, 21.iv.2014, I. Renan; *Central Negev*: 1♂, Bor Hemet, 2.x.2015, A. Weinstein; 1♀, Midreshet Ben Gurion, 6.xi.2019, I. Renan; 1♀, Mishor Yamin, 13.v.2014, I. Renan; 5♂, Nahal Peres, 1.vi.1998, A. Freidberg; 1♂, Sede Boqer, 28.viii.1960, M.P. Pener; *Southern Negev*: 1♀, HaMeshar, 1.i.1991, D. Rauscher; 1♂, Nahal Shitta, 16.v.1999, I. Yarom & V. Kravchenko; 1♀, Nahal Shitta, 18.viii.2016, A. Weinstein; 1♂, Ne'ot Semadar, 21.vii.2018, A. Weinstein; 1♂, Elat, 16.vi.1981, R. Kopan; *'Arava Valley*: 1♀, Elat, 10.ix.2017, B. Shalmon; 1♂, Elat, 21.vii.2018, B. Shalmon; 1♂, Elot, 26.vii.1970, M. Broza; 1♂, Elot, 26.vii.1970, M. Broza; 1♂, Elot, 19.viii.2016, A. Weinstein; 1♂, Elot, 6.ix.2016, Zvik Eilon; 1♂, Elot, 10.ix.2017, B. Shalmon; 1♂, 'En 'Avrona, 3.iv.2017, N. Segev; 1♀, 'En 'Avrona, 14.v.2017, N. Segev; 2♂, 'En 'Avrona, 19.v.2017, A. Weinstein; 1♂, 'En 'Avrona, 17.viii.2017, B. Shalmon; 1♀, 'En 'Avrona, 13.ix.2017, N. Segev; 1♂, Hazeva, 7.v.1991, A. Talmor; 1♀, Hazeva, 9.viii.1991, D. Rauscher; 1♂, Hazeva, 8.vii.1992, A. Ionescu; 1♂, Hazeva, 30.viii.1995, A. Freidberg; 1♂, Hazeva, 6.vi.1997, A. Maklakov; 1♂, Hazeva, 20.x.1999, V. Kravchenko; 1♂, 'Iddan, 21.ix.1999, V. Kravchenko; 1♂, Nahal Shezaf Nature Reserve, 22.iii.2013, S. Talal; 2♂, Samar, 18.viii.2016, A. Weinstein; 2♂, Yotvata, 22.iv.1962, J. Wahrman; 1♀, Yotvata, 30.iv.1990, A. Eitam; 3♂, Yotvata (Hay Bar) Nature Reserve, 18.xi.2015, A. Weinstein; 1♂, Yotvata (Hay Bar) Nature Reserve, 8.vii.2020, A. Weinstein; 1♂, Yotvata (Hay Bar) Nature Reserve, 8.vii.2020, D. Simon (all SMNHTAU).

Central Negev: 1♀, Nahal Nafha, 20.x.1960, Ch. Sandler (all OQT).

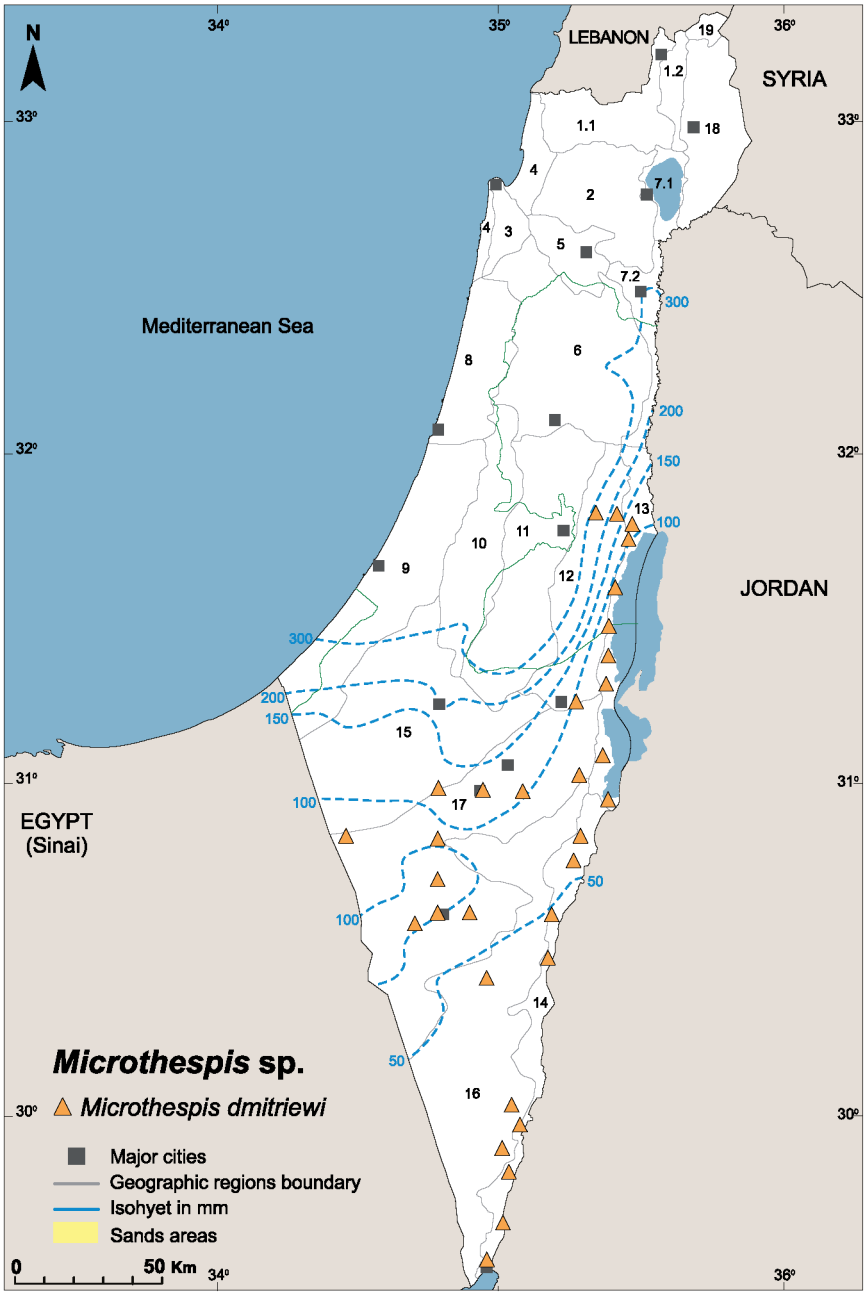
General distribution: A xerothermophilous species associated with arid climate. Djibouti, Ethiopia (type locality), Iran, Israel, Jordan, Oman, Pakistan, Saudi Arabia, Somalia, United Arab Emirates, Yemen.

Records in Israel: Central Negev, Dead Sea Area, Judean Desert, Southern Negev, 'Arava Valley.

Biological notes: Found in areas rich in vegetation, in wadis and dry saline marshes (Fig. 67C, F), along the perimeter of the 'Arava Valley and the Dead Sea basin (alt. -400 m) and up to the high Negev (alt. ~1000 m). No records from the sandy habitats of the western Negev are known. Nymphs and adults were seen active at night on high shrubs and trees. One copulation (September 2020) was observed.

First or second instars seen (viii.2017, xi.2025) walking on the ground and inside *Alhagi maurorum* Medik (Dead Sea area, salt marshes). Wahrman noted that a nymph was attracted to light in 'En Gedi (Wahrman, in litt. 8.1957).

Male macropterous, female brachypterous. Males are good fliers and attracted to artificial light. The ootheca (Fig. 69C, length: 8.0–13.0 mm, n=2) (Rauscher, in litt.) is typically deposited on branches.



Map 6. *Microthespis dmitriewi*, distribution in Israel.

Conservation: Least concern. Common in the natural habitats in its areas of occurrence.

Notes: The species was first mentioned from the Levant by Uvarov (1930) – A male from Jericho (16.vii.1927). The illustration in Audouin (1825: pl. 1, fig. 14), depicts a male that fits *M. dmitriewi* rather than *R. baetica*, as in Saussure (1871: 256).

Genus *Eremoplana*, Stål, 1877

אֶצָן

The genus is widespread from northeast Africa throughout the Arabian Peninsula and the southern Levant (Battiston *et al.* 2010). A xerothermophilous genus associated with dry climate and arid areas.

Eremoplana infelix Uvarov, 1924

Figs 15E, F, 24A–D, 69K, Map 7

אֶצָן עָנָק.

Body length: ♂ 89.0–103.0 mm, ♀ 89.0–114.0 mm.

Material examined: Israel: *Mount Hermon*: 1♀, Newe Ativ, 29.x.1968, Israeli; *Golan Heights*: 1♀, Nahal Zawitan, 18.x.1972, M. Goren; *Upper Galilee Hills*: 1♀, 'Enot 'Enan, 8.ix.1941; 1♀, Rosh Pinna, 30.ix.1951, Y. Verechson; *Sea of Galilee area*: 1♀, 'En Gev, 20.xii.1941, Y. Palmoni; 1♀, Massada, 17.viii.1957, J. Wahrman; *Northern Coastal Plain*: 1♀, Yagur, 1.x.1942; *Karmel (Carmel) Ridge*: 1♀, Yagur, 28.viii.1953, A. Keinan; 1♂, Haifa (Hefa), 15.ix.1959, Y. Werner; 1♂, Har Karmel, 20.iii.1955, M. Sternlicht; 1♀, Qeren Karmel, 4.vi.1950, M. Sternlicht; *Yizre'el (Jezreel) Valley*: 1♀, 'Emeq Yizre'el, *Central Coastal Plain*: 1♀, Zur Natan, 14.xii.1979, K. Yefenof; *Shomeron (Samaria)*: 1♀, HaGilboa' Nature Reserve, 29.x.2006, G. Wizen; 1♀, Nahal Tirza, 15.x.1980, D. Gerling; *Judean Foothills*: 1♂, Har'el, 1♀, Sha'ar haGay, 28.viii.1949, J. Wahrman; *Judean Hills*: 1♀, Hevron (Hebron), 1.ix.1942, H. Feigl; 1♀, Ramallah, 16.x.1943, H. Bytinski-Salz; 1♂, Jerusalem, 20.ix.1954, J. Wahrman; 1♀, Jerusalem, 1.v.1957, P. Amitai; 1♂, Jerusalem, 20.ix.1963, Katznelson; 1♂, Jerusalem, 13.ix.1965, J. Wahrman; 1♂, Jerusalem, 17.ix.1965, J. Wahrman; 1♀, Jerusalem, 17.x.1999, J. Halperin; 1♀, Jerusalem, 1♂, Jerusalem, J. Halperin; *Judean Desert*: 1♀, Ma'ale Adummim, 6.vii.1991, D. Rauscher; 1♀, Mizpe Yeriho, 20.vii.2016, A. Weinstein; 1♀, Nahal Perat, 26.x.1967, J. Halperin; *Dead Sea Area*: 1♀, Enot Zuqim, 28.xii.1942, U.G. Tuvia; 1♀, Dead Sea, 15.viii.1939, H. Bytinski-Salz; *Northern Negev*: 1♂, 1♀, Mash'abbe Sade, 16.viii.1954, J. Wahrman; 2♂, Mash'abbe Sade, 24.viii.1965, J. Wahrman; 2♂, Zomet haNegev, 16.viii.1954, J. Wahrman; 1♀, Be'er Hagar, 2.ix.1955, L. Fishelsohn; *Central Negev*: 1♀, Be'er Hagar, H. Bytinski-Salz; 1♀, 'En Mor, 29.x.1954, L. Fishelsohn; 1♀, Horvot Shivta, 31.x.1954, L. Fishelsohn; 1♀, Makhtesh Ramon, 1.x.1991, D. Rauscher; 1♀, Nahal Mamshit, 13.viii.1958, J. Krystal; 1♂, Nahal Nafha, 18.viii.1957, J. Wahrman; 1♀, 1♀, Nahal Zin, 21.vii.2018, A. Weinstein; 1♀, Yeroham, 25.vi.1965, J. Wahrman; 1♂, 2♀, Yeroham, 25.viii.1965, J. Wahrman; 1♀, Yeroham, 1.x.2018, A. Weinstein; 1♀, Yeroham, 26.v.2020, D. Simon; 'Arava Valley: 1♂, Timna', 28.x.1957, J. Wahrman (all SMNHTAU).

Karmel (Carmel) Ridge: 1♂, Har Karmel, 5.v.1923, G.E. Bodkin; *Judean Hills*: 1♀, Jerusalem, 22.x.1926, F.S. Bodenheimer; *Northern Negev*: 1♀, Ruhama, 29.viii.1929, H. Bytinski-Salz (all PPIS).

Sea of Galilee area: 1♀, Ginnosar, 24.ix.1959, Ch. Sandler; *Central Coastal Plain*: 1♂, Nahshonim, 20.ix.1957; *Judean Foothills*: 1♀, Nahshon, 20.ix.1957 (all OQT).

General distribution: Egypt (type locality), Israel, Jordan, Lebanon, Saudi Arabia, Sudan.

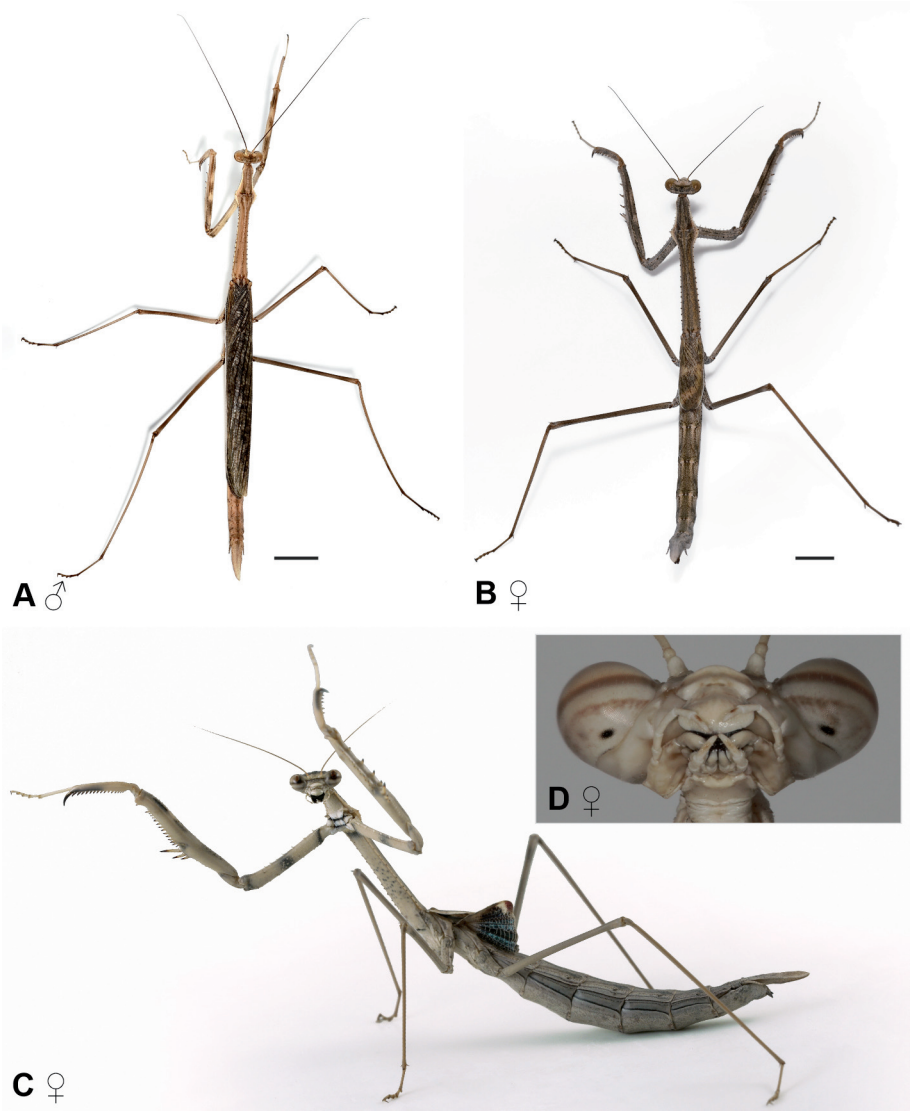
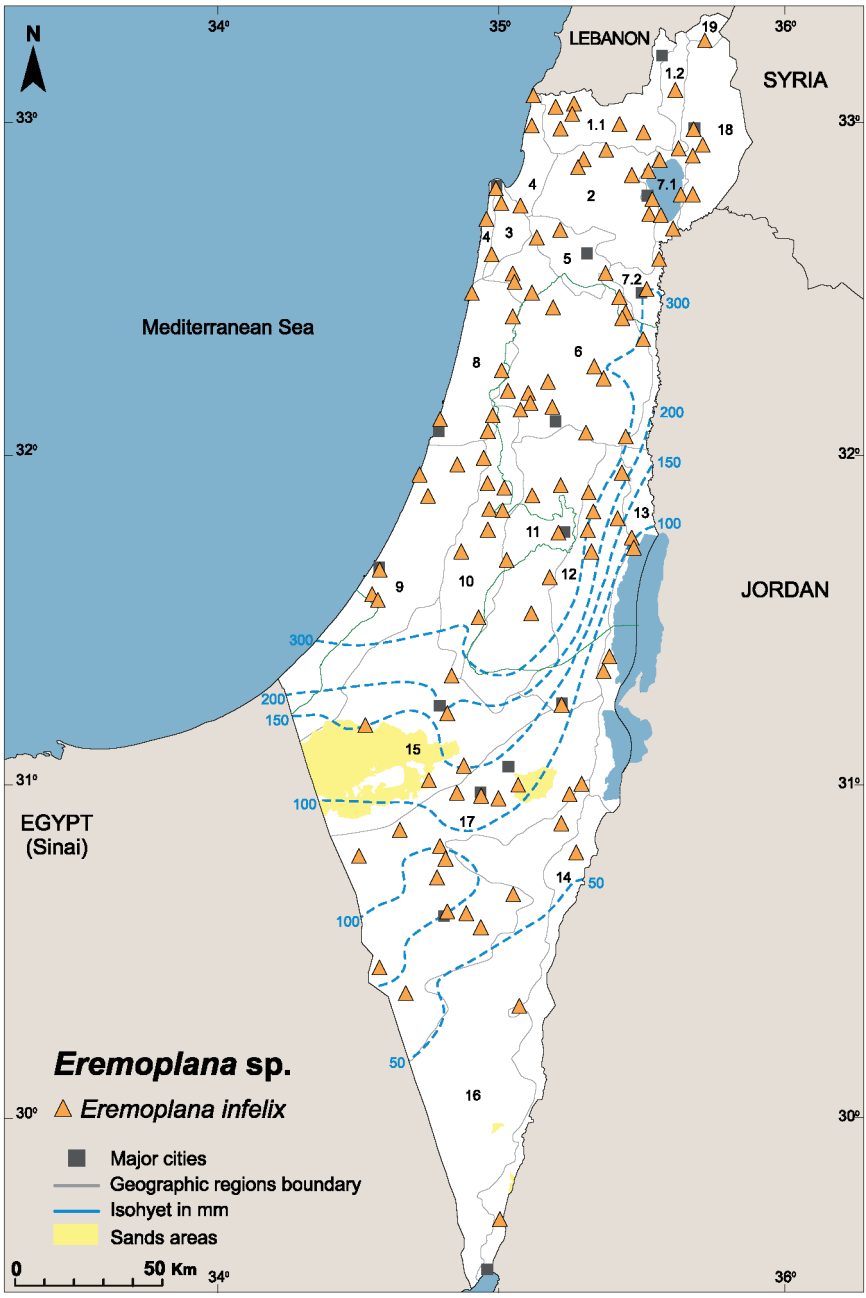


Fig. 24. *Eremoplana infelix*: (A) Western Negev, viii.2020, ♂ live, habitus, dorsal view; (B) Western Negev, vii.2020, ♀ live, habitus, dorsal view, (C) 356556, Yeroham, 1.x.2018, ♀ live, habitus, deimatic display; (D) ♀ head details; scale bar = 10 mm. Photos A, B by Avi More Yossef.

Records in Israel: Central Coastal Plain, Central Negev, Dead Sea Area, Golan Heights, Hula and Korazim Block, Jordan Valley, Judean Desert, Judean Foothills, Judean Hills, Karmel (Carmel) Ridge, Lower Galilee, Mount Hermon, Northern



Map 7. *Eremoplana infelix*, distribution in Israel.

Coastal Plain, Northern Negev, Sea of Galilee area, Shomeron (Samaria), Southern Coastal Plain, Southern Negev, Upper Galilee Hills, Yizre'el (Jezreel) Valley, 'Arava Valley.

Biological notes: Inhabits mixed vegetation: garrigue shrubland (Fig. 66B), semi-steppe shrubland (Fig. 66E), grass, herbaceous plants, in arid areas along wadis rich in vegetation (Fig. 66B), in the Mediterranean region in open rocky shrubland and also in sandy habitats along the coastline. Active day and night. Male macropterous, female brachypterous. Males are good fliers and attracted to artificial light. The ootheca (Fig. 69K, length: 23 mm, n=1) (Rauscher, in litt.) is typically deposited on lateral surfaces of rocks.

Conservation: Least concern. Common, but with a discontinuous distribution in the Mediterranean habitats.

Notes: The longest mantid (adult female) in Israel and probably also in the Palaearctic region.

Family Amelidae Westwood, 1889
Genus *Ameles* Burmeister, 1838
דּוֹלְגָן

The genus *Ameles* has a Mediterranean-Turanian distribution and its geographic limits are from the Atlantic coasts of Portugal and Morocco and the Canary Islands in the west and to Afghanistan in the east (Agabiti *et al.* 2010). Despite their wide distribution, these mantids are poorly known, and both their systematics and ecology are unknown for most of the species (Battiston & Fontana 2005). This genus currently comprises 24 species and subspecies (Otte *et al.* 2023) or 23 species (Villani 2020). In some regions the genus is represented in groups of species or species complexes (Battiston & Fontana 2005; Agabiti *et al.* 2010; Villani 2020). Identification of *Ameles* species is a challenging task requiring much experience due to the ambiguous descriptions with only a few drawings and great intraspecific morphological variability (Obertegger & Agabiti 2012). The complexity of the genus and the many closely-related species requires deep revision, which is beyond the goals of the current study.

The genus comprises small xerothermophilous species, with body sizes ranging from 20 mm to 30 mm. While the females are micropterous, the males are normally macropterous (a diagnostic concept that does not apply to all species (Battiston *et al.* 2018)). They are ground-dwellers, preferring grass and steppe habitats where, especially the females, move quickly. They also occur in the sparser coastal Mediterranean shrubland and the internal regions rich in herbaceous vegetation, as well as at elevated altitudes (Agabiti *et al.* 2010). On Mt Hermon, one can find them up to the altitude of 2000 m.

Giglio-Tos (1893) listed *Ameles heldreichi* from Israel, later identified as *Ameles syriensis* (Giglio-Tos 1915) from the Golan Heights. Buxton and Uvarov (1923)

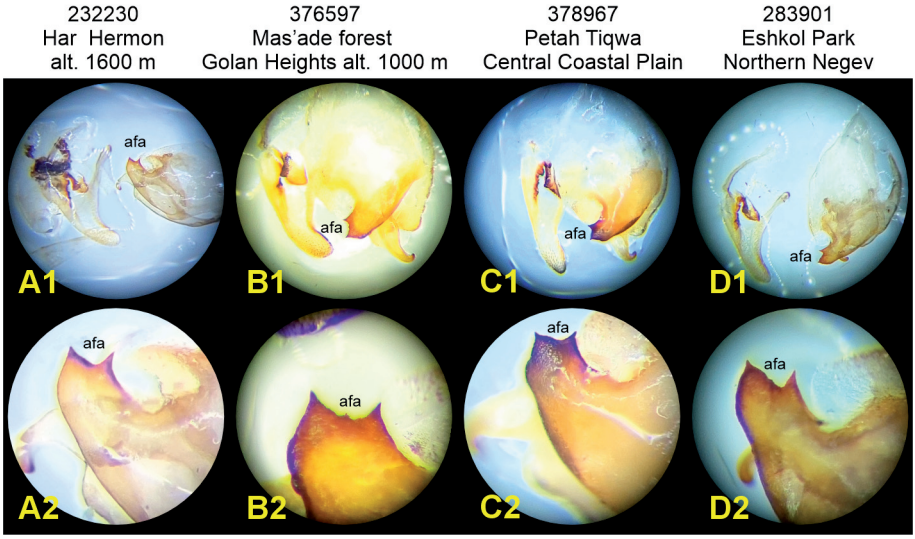


Fig. 25. *Ameles heldreichi* male genitalia: (A) Mt Hermon, alt. 1600 m; (B) Mas'ade forest, Golan Heights, alt. 1000 m; (C) Petah Tiqwa, Central Coastal Plain; (D) Park Eshkol, Northern Negev.

listed *A. heldreichi* (from various localities). Bodenheimer (1937) added to his list *Ameles aegyptiaca* Werner, 1913 (with no collection data).

Based on the SMNHTAU collection and fieldwork in Israel, two clear morphological forms can be defined (among the rest) by the shape of the eyes: round eyes vs. conical eyes. According to Villani (pers. comm., 2021), these forms represent two species complexes: the *kervillei* complex and the *heldreichi* complex. Those forms are also separated by the walking legs' pubescence. In the *kervillei* complex, the middle and hind legs are covered with long thin hairs, while in the *heldreichi* complex the hairs are short (Villani 2020).

Ameles heldreichi complex

The *heldreichi* complex is represented in the Levant by at least two species: *Ameles heldreichi* and *Ameles syriensis*. Giglio-Tos (1915) described *Ameles syriensis* from one female specimen collected in August of 1893 by Festa at Fick or Fik (Giglio-Tos 1893) – the recently abandoned village of Fiq, today near Kibbutz Afiq in the southern Golan Heights. The description by Giglio-Tos (1927) is ambiguous and relates to a single female. Agabiti *et al.* (2010) supplied additional ratio traits but those were based on one male and one female from Jordan (Wadi Shu'ayb near Amman, about 100 km from Kibbutz Afiq, Map 8). Our morphological comparison of females and males and male genitalia morphology of the represented specimens (6♂) from the north, center and south of Israel (Fig. 25) does not show overall significant differences. This can be explained by the

continuous variation, supporting the hypothesis that population gradients from Mt Hermon via the Golan Heights to the northern Negev (HaBesor National Park – Eshkol Park) represent only one species. Further investigation and molecular work are needed to confirm or reject this assumption.

Considering the paucity of comparative data from the literature, based on only a few specimens and considering the continuous variation characteristic of the species in the genus, it is not possible to clearly separate morphologically the *heldreichi* complex in Israel into two distinctive species or groups. At this point, therefore, we consider (in the Key, Results and Discussion) all the specimens from Mt Hermon and the Golan Heights area as *Ameles heldreichi*. It is thus also not possible to provide a suitable distribution map and therefore the records map and the tables in the results refer to this complex in Israel as one species – *Ameles heldreichi*.

Ameles heldreichi Brunner von Wattenwyl, 1882

Figs 6B, 13B, C, 26A–E, 68D, 70F, Map 8

דּוֹלְגָן חַד־עַיִן

Body length: ♂ 24.0–26.0 mm, ♀ 21.0–24.5 mm.

Material examined: Israel: *Mount Hermon*: 3♀, Mt Hermon, 28.x.1968, Y. Ayal; 1♂, Mt Hermon, 23.ix.1972, M. Kaplan; 3♀, Mt Hermon, 12.x.1997, M. Broza; 1♂, 1♀, Mt Hermon, 4.viii.2018, D. Simon; 1♂, Mt Hermon, 17.viii.2021, A. Weinstein; 1♀, Newe Ativ, 11.vi.1991, D. Rauscher; *Golan Heights*: 1, Allone haBashan, 27.x.2011, Uri Levi; 1♂, Har Susita, 13.iv.1940, Y. Palmoni; 1♂, Ma'agar Bental, 19.viii.2021, A. Weinstein; 1♂, Ma'agar Bental, 19.viii.2021, B. Shalmon; 1♀, Mas'ada, 17.viii.2021, B. Shalmon; 5♂, 6♀, Mas'ada, 17.viii.2021, A. Weinstein; 1♂, 1♀, Mas'ada, 17.viii.2021, D. Simon; 1♂, Mas'ada, 18.viii.2021, A. Weinstein; 1♂, Merom Golan, 15.ii.1987, G. Gissis; 1♂, Nahal 'Orevim, 14.v.1987, Giora [Gissis]; 1♂, Nahal Samakh, 16.vi.1975, Faunistics; 1♀, Nahal Yehudiyya, 27.vi.1985, M. Sternlicht; 1♂, Panyas (Banyas), 24.iv.1968, K. Yefenof; 1♀, Quneitra, 11.vii.1967, M.P. Pener *et al.*; *Upper Galilee Hills*: 1♀, Elon, 15.v.1960, L. Fishelsohn; 1♂, 'En Zetim, 15.v.1996, M. Trebicz; 1♂, 'En Zetim, 19.v.1996, J. Pavis; 1♂, 'En Zetim, 2.v.2016, A. Kazachenko; 1♂, Har Meron, 13.vi.1961, J. Wahrman; 1♂, Har Meron, 22.ix.1961, M.P. Pener *et al.*; 2♂, Har Meron, 5.x.1976, A. Freidberg; 1♂, Nahal Bezet, 23.x.1986, I. Susman; 1♂, Qiryat Shemona, 7.vii.1958, L. Fishelsohn; 1♂, Ramot Naftali, 10.v.2006, M. Ben-Ari; 1♀, Tel Hay, 27.i.1927, F.S. Bodenheimer; 1♂, Zefat, 11.viii.2005, Y. Ptashkovsky; 1♂, Zefat, 11.vi.2006, Y. Ptashkovsky; *Lower Galilee*: 1♀, Allone Abba, 13.x.2015, L. Friedman; 1♂, Ilaniyya, 20.iv.1998, T. Atalya; 1♂, Kinneret (Moshava), 8.iv.1965, M.P. Pener *et al.*; 1♂, Kokhav haYarden, 28.iv.1981, I. Yarom; 1♂, Poriyya, 13.iv.1970, Faunistics; 1♂, Qiryat Tiv'on, 15.v.1956, M. Sternlicht; *Sea of Galilee area*: 1♂, Bet Zera', 6.v.1967, Y. Palmoni; 1♂, Hammat Gader, 8.vi.2023, Z. Yanai; 1♂, Migdal, 14.iv.1942, Y. Palmoni; 1♂, Teverya (Tiberias), 27.iv.1954, Y. Palmoni; *Northern Coastal Plain*: 1♂, Qiryat Hayyim, 9.iv.2005, Y. Ptashkovsky; *Karmel (Carmel) Ridge*: 1♂, Bat Shelomo, 6.ix.1970, Y. Palmoni; 1♂, Ma'yan Zevi, 28.iv.1958, Y. Werner; 1♂, Nahalal, 1.viii.1927, Y. Palmoni; 1♀, Nahalal, 18.xii.1950, M. Sternlicht; 1♂, Nir 'Ezyon, 8.v.1964, S. Blondheim; 1♂, Nir 'Ezyon, 18.v.1964, S. Blondheim; 3♂, 1♀, Zikhron Ya'aqov, 26.iv.1954, L. Fishelsohn; 2♀, Zikhron Ya'aqov, 3.v.1954, Ch. Lewinsohn; 1♀, Zikhron Ya'aqov, 22.v.1954, L. Fishelsohn; 1♀, Zikhron Ya'aqov, 29.iv.1958, Ch. Lewinsohn; 1♂, Zikhron Ya'aqov, 13.v.1975, J. Kugler; *Jordan Valley*: 1♀, Bet haShitta, 17.i.1945, Y. Palmoni; 1♂, Bet haShitta, 4.viii.1983; 1♂, Bet haShitta, 1♂, Gesher, 23.iii.2013, S. Talal; *Central Coastal Plain*: 2♂, Binyamina, 6.iv.2022, A. Weinstein; 1♂, 1♀, Hadera, 31.x.1936, Y. Palmoni; 1♀, Herzliyya, 28.iv.2022; 1♂, Kefar haRo'e, 26.iv.1965, S. Blondheim; 3♂, Maggal, 1.v.1956, S. Zitron; 1♂, Nahal Alexander, 7.iv.2015, G. Sinaiko; 1♂, Petah Tiqwa, 21.iv.1956, J. Wahrman; 1♂, Petah Tiqwa, 21.iv.1991, D. Rauscher; 1♂, Petah Tiqwa, 7.v.2019, A. Weinstein; 1♂, Petah Tiqwa, 29.iii.2021, A. Weinstein; 1♂, Petah Tiqwa,

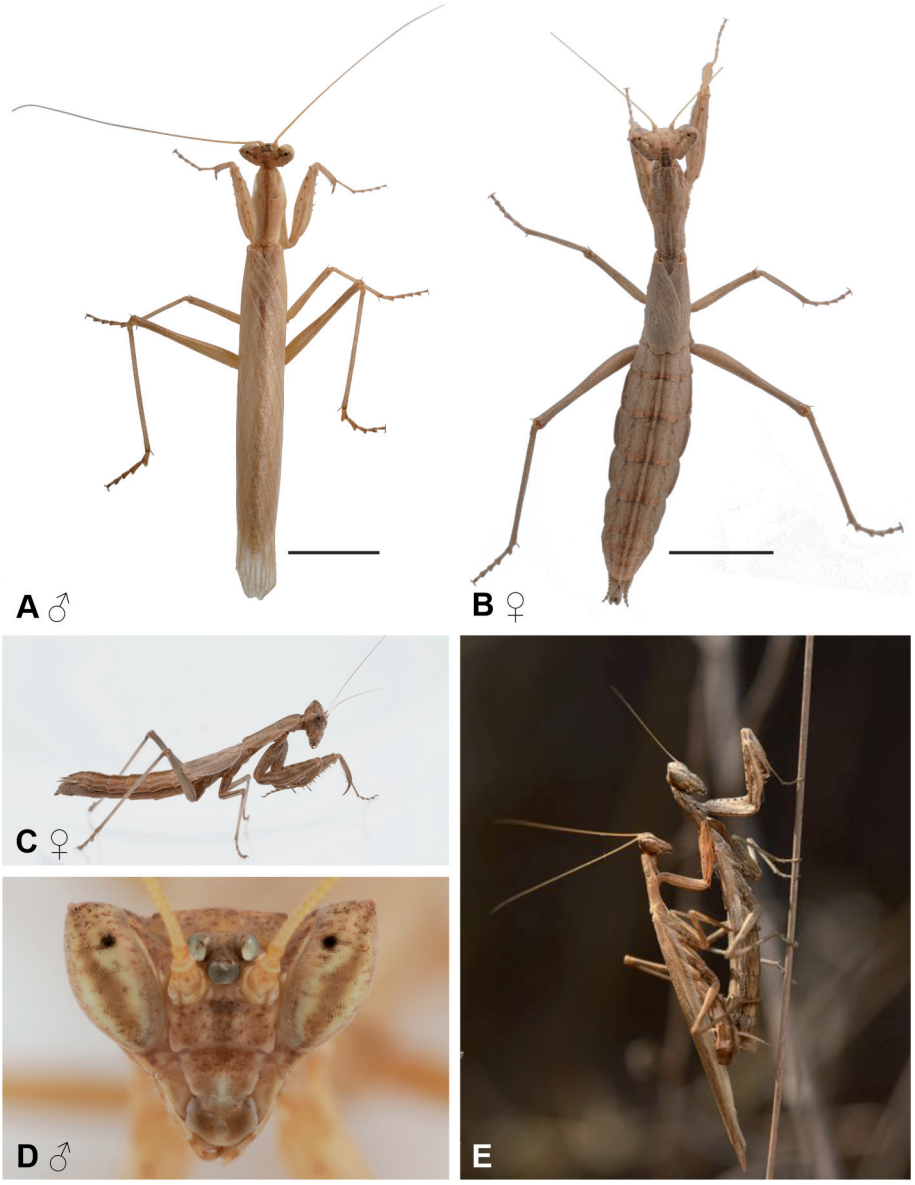


Fig. 26. *Ameles heldreichi*: (A) Odem Forest, 17.viii.2021, ♂ live, habitus, dorsal view; (B) Petah Tiqwa, 18.xi.2021, ♀ live, habitus, dorsal view; (C) Odem Forest, 17.viii.2021, ♀ live, habitus, lateral view; (D) Odem Forest, 17.viii.2021, ♂ head; (E) Rishon leZiyyon, 28.x.2022, copulating pair, photo by Oren Auster; scale bar = 5 mm.

4.v.2021, A. Weinstein; 1♀, Petah Tiqwa, 15.xi.2021, A. Weinstein; 1♂, Tel Aviv, 2.viii.1945; 1♀, Tel Aviv, 7.x.1957, L. Fishelsohn; 1♂, Tel Aviv, 15.viii.1958, J. Krystal; 1♀, Tel Aviv, 7.xii.1959, M. Dor; 1♂, Zofit, 1.viii.1957, B. Khamilevski; 1♂, Zofit, 1.viii.1957, M. Dor; 1♀, Zur Natan, 2.i.1979, K. Yefenof; *Shomeron (Samaria)*: 1♂, 'Ez Efrayim, 6.viii.1995, L. Friedman; 1♀, Har Barqan, 3.iv.2004, G. Wizen; 1♀, Kefar Tappuah, 11.vii.1967, M.P. Pener *et al.*; 1♂, Nahal Qana, 9.vii.2007, V. Kravchenko; *Southern Coastal Plain*: 1♀, Be'eri, 22.iv.1981, J. Kugler; 3♂, Ben Shemen, 1.xi.1988, A. Shlagman; 1♂, Ben Shemen (moshav), 2.v.1981, E. Shney-Dor; 1♂, Dorot, 15.iv.1952; 1♂, Holon, 21.vii.2017, A. Weinstein; 1♀, Miqwe Yisra'el, 16.x.1992, D. Rauscher; 1♂, Nezer Sereni, 17.iii.1955, J. Halperin; 1♀, Nezer Sereni, 3.viii.1965, J. Halperin; 1♀, Talme Yosef, 7.viii.2021, Y. Zvik; *Judean Foothills*: 1♂, Bet Guvrin, 24.iv.1983, E. Shney-Dor; 1♀, Bet Nir, 18.v.2022, L. Ozeri; 2♂, Bet Shemesh, 8.iv.1979, M. Kaplan; 1♂, Emeq haEla, 21.iii.2010, H. Federman; 2♂, Hartuv, 14.viii.1956, J. Wahrman; 1♀, Hartuv, 25.v.1957, Y. Werner; 1♂, Hartuv, 25.v.1957, Y. Werner; 1♀, Lahav, 7.ix.1960, M.P. Pener ; 1♂, Lahav, 28.iv.1963, Faunistics; 2♂, Lahav, 28.iv.1963, M.P. Pener *et al.*; 1♂, Lahav, 14.v.1964, S. Blondheim; 1♂, Lahav, 26.x.1965, S. Blondheim *et al.*; 1♀, Lahav, 28.iv.1969, M.P. Pener *et al.*; 1♂, Lahav, 7.iv.1996, A. Keinan; 1♂, Lahav, 7.iv.1996, T. Kimchi; 1♂, Lahav, 7.iv.1996, M. Varon; 1♂, Lahav, 7.v.1996, O. Nahum; 1♂, Sha'ar haGay, 23.v.1967, H. Ginsbourg; 1♂, Shoham Forest Park, 17.iii.2006, M. Sagie; *Judean Hills*: 1♀, Abu Ghosh, 18.viii.1964, G. Tsabar; 1♂, 'En Hemed, 21.v.1965, Faunistics; 2♂, Even Sappir, 18.v.1957, Ginzburg; 1♂, Jerusalem, 6.viii.1939, H. Bytinski-Salz; 1♂, Jerusalem, 5.x.1942, H. Bytinski-Salz; 1♀, Jerusalem, 1.ix.1948; 1♂, Jerusalem, 1.x.1948; 1♂, Jerusalem, 6.vii.1949, J. Wahrman; 1♂, Jerusalem, 9.vii.1949, J. Wahrman; 1♂, Jerusalem, 23.vii.1949, J. Wahrman; 1♂, Jerusalem, 26.vii.1949, J. Wahrman; 1♀, Jerusalem, 7.viii.1949, A. Zehavi; 1♀, Jerusalem, 29.viii.1949, J. Wahrman; 1♀, Jerusalem, 27.ix.1952, J. Wahrman; 1♂, Jerusalem, 13.x.1952, J. Wahrman; 1♀, Jerusalem, 21.ii.1953, J. Wahrman; 1♂, Jerusalem, 26.vii.1954, J. Wahrman; 1♀, Jerusalem, 10.xii.1956, J. Wahrman; 1♀, Jerusalem, 1.v.1957, J. Wahrman; 1♀, Jerusalem, 13.v.1957, J. Wahrman; 2♀, Jerusalem, 17.v.1957, J. Wahrman; 2♂, Jerusalem, 25.v.1957, J. Wahrman; 2♂, Jerusalem, 24.vii.1957, Y. Werner; 1♂, Jerusalem, 10.x.1957, J. Wahrman; 1♂, Jerusalem, 15.x.1957, Y. Werner; 1♂, Jerusalem, 29.x.1957, Y. Werner; 1♂, Jerusalem, 16.iv.1958, C. Shina; 1♂, Jerusalem, 23.iv.1965, S. Blondheim; 3♂, Jerusalem, 7.v.1965, Faunistics; 1♂, Jerusalem, 7.v.1965, M.P. Pener *et al.*; 1♂, Jerusalem, 11.v.1965, Latner; 1♂, Jerusalem, 5.v.1967, M.P. Pener *et al.*; 1♂, Jerusalem, 14.v.1971, Faunistics; 1♀, Jerusalem, 19.v.2022, A. Weinstein; 1♀, Jerusalem, 19.v.2022, D. Simon; 1♂, Moza, 1.v.1952; 1♀, Ramat Rahel, 12.vi.1974, Faunistics; 1♂, Ramat Rahel, 7.vii.1975, Faunistics; *Judean Desert*: 1♂, Ma'ale Adummim, 12.vii.1990; *Dead Sea Area*: 1♂, 'Enot Samar, 30.iii.1999, V. Kravchenko; *Northern Negev*: 1♂, Berosh, 28.iv.1963, Faunistics; 1♂, Devira, 10.iv.2006, D. Dascalu; 1♂, Devira, 10.iv.2006, H. Eini; 1♂, Devira, 10.iv.2006, K. Gayer; 1♂, Devira, 31.iii.2010, T. Cohen; 1♂, Devira, 19.iv.2015, L. Friedman; 1♂, Eshel haNasi, 9.viii.1963, M.P. Pener & S. Blondheim; 1♂, Lehavim, 4.iv.1999, D. Givoni; 1♂, Lehavim, 4.iv.1999, M. Negev; 1♂, Nahal Besor, 17.iv.1984, E. Shney-Dor; 3♂, Park Eshkol, 14.iv.2017, Y. Zvik; *Central Negev*: 1♂, Mishor Yamin, 23.iii.1954, A. Shulov (all SMNHTAU).

Karmel (Carmel) Ridge: 1♀, Mt Karmel, 15.iv.1924, G.F.H.; 1♂, Qeren Karmel, 28.iv.1930, W. Br.; *Southern Coastal Plain*: 1♂, Gat, 21.iv.1942, E. Rivnay; 1♂, Miqwe Yisra'el, 25.x.1935, J. Brair; *Judean Foothills*: 1♂, Ben Shemen, 14.iv.1923, F.S. Bodenheimer; 1♀, Ben Shemen, 6.ii.1927, F.S. Bodenheimer; 1♂, Hartuv, 21.iv.1925 (all PPIS**).**

Yizre'el (Jezreel) Valley: 1♂, Oranim, 21.v.1969, Ch. Sandler (OQT).

General distribution: Bulgaria, Cyprus, Greece (type locality), Israel, Jordan, Lebanon (https://inaturalist.org/observations/33256159), Libya, Syria (https://inaturalist.org/observations/185746559), Romania, Turkey, Ukraine.

Records in Israel: Central Coastal Plain, Central Negev, Dead Sea Area, Golan Heights, Hula and Korazim Block, Jordan Valley, Judean Desert, Judean Foothills, Judean Hills, Karmel (Carmel) Ridge, Lower Galilee, Mount Hermon, Northern Coastal Plain, Northern Negev, Sea of Galilee area, Shomeron (Samaria), Southern Coastal Plain, Upper Galilee Hills, Yizre'el (Jezreel) Valley.

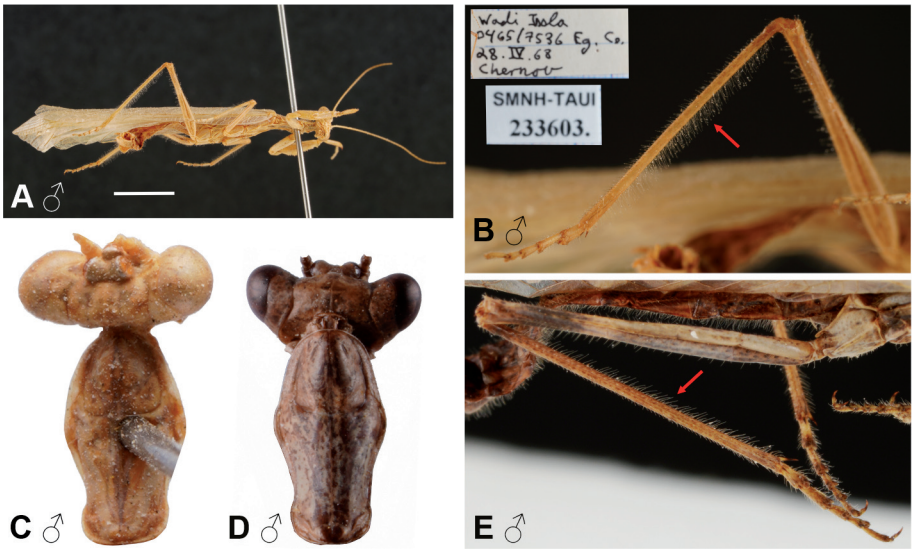


Fig. 27. *Ameles kervillei* vs *A. aegyptiaca*: (A–C) *A.* cf *aegyptiaca*, 233603, Egypt, Sinai, Wadi Isla, 28.iv.1968, ♂ (A) habitus; (B) hind leg pubescense; (C) pronotum, dorsal view; (D, E) *A.* cf *kervillei*: (D) 233821, Har Horesha, 18.iv.1998, ♂ pronotum, dorsal view (E) 220635 Kerem Shalom, 5.iv.1964, ♂, hind leg pubescense; scale bar = 5 mm.

Biological notes: Found in low vegetation: herbaceous garrigue, grass and steppe (Figs 65A, 66B, D, H). From the north of the country down to Be'er Sheva' in the northern Negev. There is some evidence of populations in the Haluza Sands (northern Negev) and in the central Negev, but these are mainly based on photographs and there is a need for specimen collection in order to understand the distribution pattern in the arid area of the Negev.

It can be found throughout the year but not necessarily at the same sites. In warmer areas it may complete two generations per year, overwintering as a nymph. The first generation matures in the spring and the second generation matures in autumn. The northernmost population (mainly on Mt Hermon; alt. 1,200 m and above) has only one generation, which develops very fast and matures mostly from August until September. At least on Mt Hermon, it overwinters as eggs in the ootheca. On Mt Hermon, the population presents a yellowish (straw color) to pale cream color that matches the coloration of the yellowish annual grass in summer. The Mt Hermon population may be a different ecotype to that of the typical Mediterranean populations.

The ootheca (length: 5–7 mm, n=3) (Rauscher, in litt.) is typically deposited on the soil (Fig. 68D) or under a stone but can also be found in depressions on the sides of stones and rocks and even on low subshrubs.

Conservation: Least concern. Common in the natural habitats within its distributional range.

Ameles kervillei complex

The *kervillei* complex is represented by at least two round-eyed-type species: *Ameles kervillei* and *Ameles aegyptiaca* Werner, 1913 (Villani pers. comm., 2021).

Ameles aegyptiaca, currently known from Egypt only, briefly described by Werner (1912) from a single male and with "Egypt" as a locality. Agabiti *et al.* (2010) added two neotypes from Egypt; male and female (Wadi Hof, 1916, coll. Adair, NHML). While the description of Agabiti *et al.* (2010) is more detailed, it lacks diagnostic information on the genitalia (abdomen missing, Agabiti *et al.* (2010)). Mohammad *et al.* (2011) adds more materials records, two are from the Mt Catherine are in the south of Sinai (Egypt).

Ameles kervillei had been described shortly by Bolívar (1911) from a single female (Baalbek, Lebanon). Agabiti *et al.* (2010) added more detailed description, based on four females: one from Israel and three from Jordan. Agabiti *et al.* (2010) remarked that "Male unknown".

In Israel, we recognize two populations of the round-eyed type (Map 8). The northern population is widespread in the eastern Judean Hills and the Judean Desert, Shomeron (Samaria), Jordan Valley and the Dead Sea area. The southern population is known from the central Negev (Negev rocky highlands) and western Negev (sandy habitats). Kaltenbach determined specimens from both populations as *Ameles kervillei* (2♂ from the northern population and 1♀ from the southern population).

During this study, two specimens of round-eyed *Ameles* were found in the SMNHTAU collection: (♂ SMNHTAU In.233603) from Wadi Isla, Egypt (southern Sinai) and (♀ SMNHTAU In.233604) from Jebel Bab (southern Sinai). The male corresponds to Agabiti *et al.* (2010: 10) description of *Ameles aegyptiaca*: "supracoxal dilation rounded and well developed" (Fig. 27), "middle and hind legs slender with dense long hairs" (Fig. 27). We used the male from Sinai (Egypt) as a side reference for the morphological comparison between the *Ameles kervillei* males from the northern population and the southern population.

Ameles cf. *aegyptiaca* (n=1) from Sinai and *Ameles kervillei* (n=6) that we examined look very similar. Both local *Ameles kervillei* populations are morphologically similar to each other, but differ from the Sinai specimens in the narrow supracoxal dilation and middle and hind legs with less dense long hairs. Although comparison of the genitalia for both populations also revealed no significant differences, without a description/illustration of *kervillei* genitalia from the type specimen the comparison will not be fully complete.

These preliminary comparative details support Kaltenbach's identification of *Ameles kervillei*. Future studies are needed to compare populations from Israel with those of the Sinai from molecular and ecological standpoints, based on fresh materials and the addition of new localities.

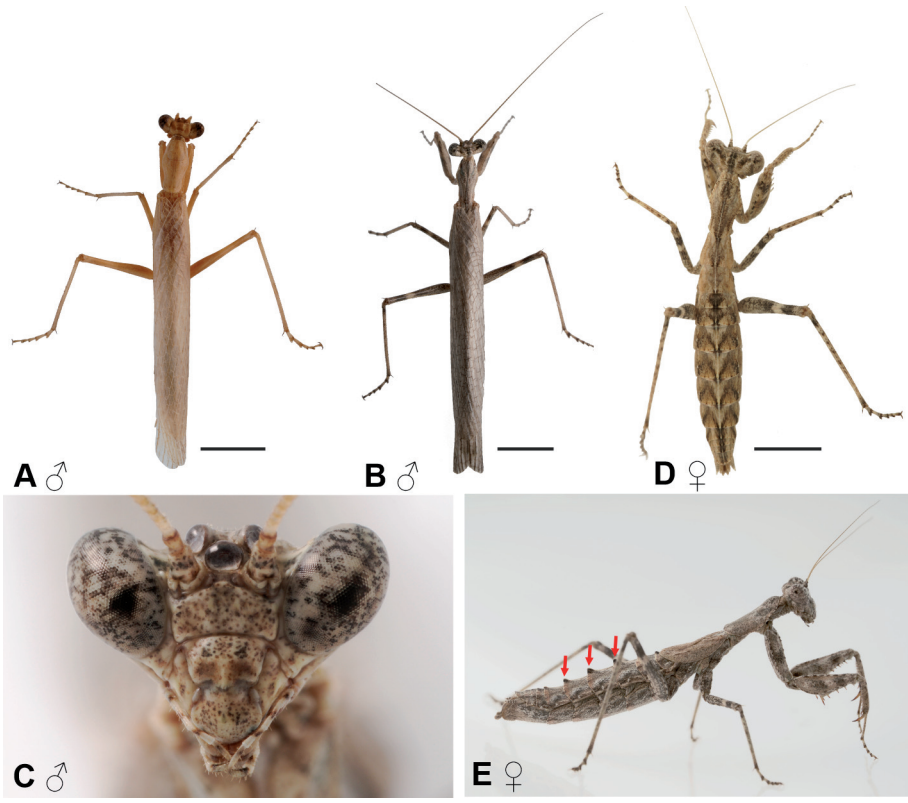


Fig. 28. *Ameles kervillei*: (A) 378962, Shademot Mehola, 1.viii.2021, ♂ live, dorsal view; (B) Western Negev, xi.2022, ♂ live, dorsal view, (C) same data, head; (D) Yeroham, 1.x.2018, ♀ last instar, live, dorsal view; (E) Zomet haNegev, 15.v.2020, ♀ live, lateral view; scale bar = 5 mm.

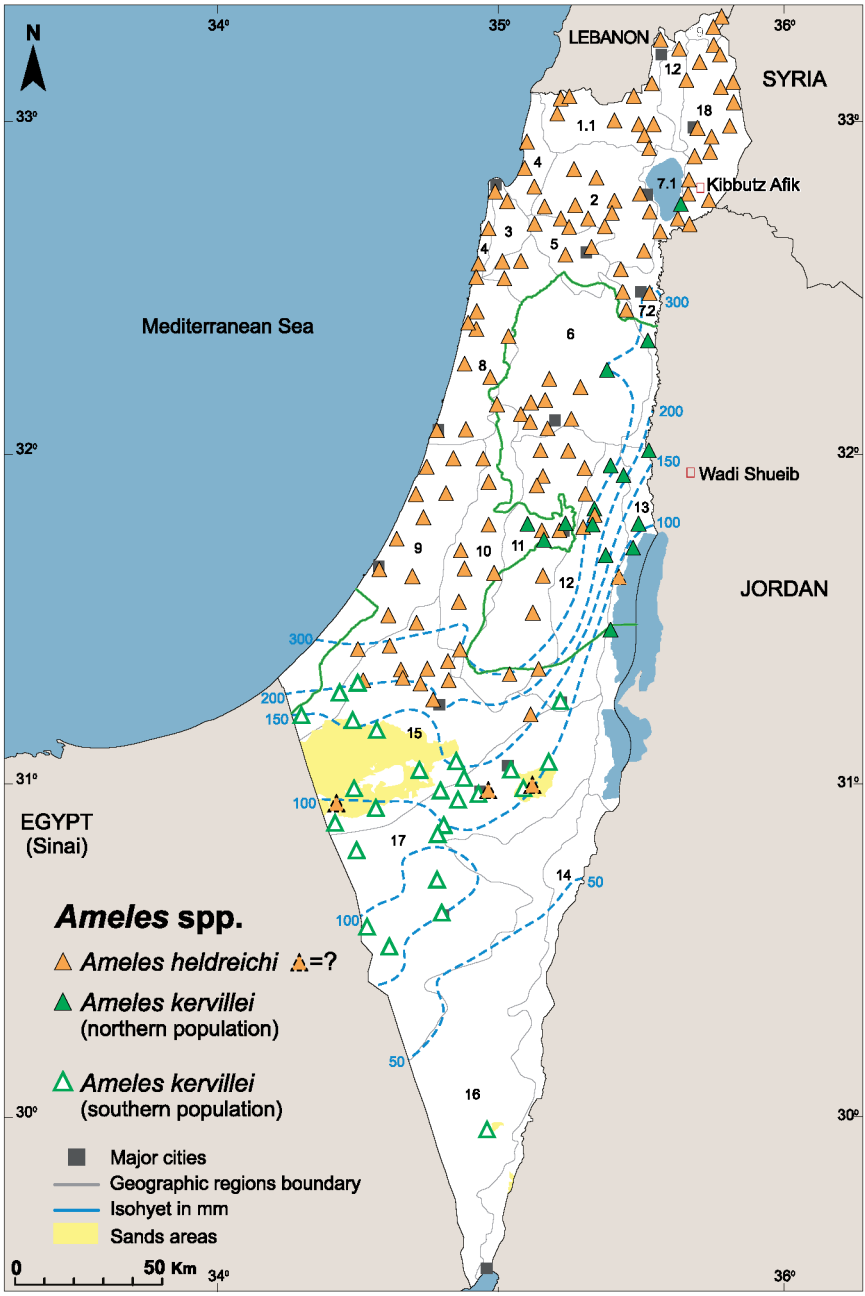
Ameles kervillei Bolívar, 1911

Figs 13D, E, 28A–E, Map 8

דוֹלְנָן עָגוֹל־עַיִן

Body length: ♂ 25.0–34.0 mm, ♀19.0 –21.0 mm.

Material examined: Israel: *Sea of Galilee area*: 1♂, Hof Shittim, 17.iv.2022, T. Novoselsky; *Jordan Valley*: 1♂, Shadmot Mehola, 1.viii.2021, Y. Zvik; *Shomeron (Samaria)*: 1♂, 'Ez Efrayim, 1.iv.1995, L. Friedman; 1♂, Nahal Tirza, 14.viii.1967, D. Gerling; *Southern Coastal Plain*: 1♀, Biq'at Hureqanya, 14.iii.2016, D. Saar; 1♂, Kerem Shalom, 5.iv.1964, J. Kugler; 1♂, Magen, 1.v.1956, J. Wahrman; *Judean Hills*: 1♀, 'En Hemed, 25.vi.1963, M.P. Pener & S. Blondheim; 1♂, Jerusalem, 14.v.1933; 1♂, Jerusalem, 3.x.1952, J. Wahrman; 4♀, Jerusalem, 11.xi.1952, J. Wahrman; 1♂, Jerusalem, 13.v.1953, J. Wahrman; 1♀, Jerusalem, 17.v.1953, J. Wahrman; 2♂, 1♀, Jerusalem, 10.v.1954, J. Wahrman; 1♂, Jerusalem, 15.v.1954, J. Wahrman; 1♀, Jerusalem, 5.vi.1954, J. Wahrman; 1♂, Jerusalem, 5.vi.1954, J. Wahrman; 1♀, Jerusalem, 3.viii.1954, J. Wahrman; 2♀, Jerusalem, 13.v.1957, J. Wahrman; 3♀, Jerusalem, 18.v.1957, J. Wahrman; 5♂, Jerusalem, 18.v.1957, J. Wahrman; 1♂, Jerusalem, 6.iv.1958, C. Shina; 3♀,



Map 8. *Ameles* spp., distribution in Israel.

Jerusalem, 27.iv.1958, J. Wahrman; 1♀, Jerusalem, 3.ix.1965; 1♀, Jerusalem, 5.ix.1965, J. Wahrman; 1♀, Jerusalem, 7.ix.1965, J. Wahrman; 2♀, Jerusalem, 15.ix.1965, J. Wahrman; 1♂, Jerusalem, 20.vi.1966, Student; 1♂, Nahal Yitav, 31.v.1973, A. Freidberg; *Judean Desert*: 1♂, Kefar Adummim, 21.iv.1992, D. Simon; *Dead Sea Area*: 2♂, 'En Gedi, 16.viii.1957; 1♂, Enot Zuqim, 30.iii.1987, G. Muller; *Northern Negev*: 1♂, Bor Mashash, 27.iii.2013, H. Bick & H. Greenbaum; 2♂, Gevulot, 19.iv.1981, E. Shney-Dor; 3♀, Har Zavoa', 20.iv.1992, D. Simon; 1♂, Horvot Haluza, 7.iv.1964, J. Kugler; 1♀, Mash'abbe Sade, 24.viii.1965, J. Wahrman; 1♂, Mash'abbe Sade, 27.viii.1965, J. Wahrman; 1♀, Park Eshkol, 14.iv.2017, Y. Zvik; 1♂, Revivim, 16.viii.1954, J. Wahrman; 1♀, Revivim, 5.v.2013, G. Wizen; 1♂, Shivta Junction, 15.v.2021, A. More Yossef; 1♂, Ze'elim, 23.viii.1992, Y. Zvik; 1♀, Zomet haNegev, 15.v.2020, A. More Yossef; *Central Negev*: 4♂, Borot Loz, 27.vii.1992, D. Rauscher; 1♂, Borot Loz, 27.vii.1992, D. Simon; 1♂, 'En haMe'ara, 1.iv.1955; 1♂, 'Ezuz, 29.iii.2015, Y. Zvik; 1♂, Har Horesha, 18.iv.1998, A. Freidberg; 2♂, 6♀, Har Nafha, 22.iv.1955, J. Wahrman; 1♂, Nahal Elot, 1.iv.1955, J. Wahrman; 2♂, Nahal Nafha, 30.iv.1959, J. Wahrman; 1♀, Nahal Nafha, 22.iv.1962, J. Wahrman; 1♀, Yeroham, 23.v.1963, M.P. Pener & S. Blondheim; 1♂, Yeroham, 15.iv.1997, M. Segal; 1♀, Yeroham, 10.iv.2016, A. Zahalka; 1♂, Zomet Haluqim, 10.iv.2006, I. Shtirberg; *Southern Negev*: 1♂, Biq'at 'Uvda, 13.iv.2017, I. Renan (all SMNHTAU).

Central Negev: 3♂, Nahal Nafha, 11.iv.1955 (OQT).

General distribution: Israel (new record) Egypt, Jordan, Lebanon, Syria (type locality).

Records in Israel: Central Negev, Dead Sea Area, Jordan Valley, Judean Desert, Judean Hills, Northern Negev, Shomeron (Samaria), Southern Coastal Plain, Southern Negev.

Biological notes: Inhabits low vegetation such as herbaceous garrigue and grass in the Mediterranean area, throughout the steppe landscape of the semi-arid areas (Figs 66B, 67B) in the east and in the wadis of the Judean Desert and the Negev. According to Rauscher (in litt.), deposition behavior and ootheca morphology are remarkably similar to those he observed in *Ameles heldreichi*. Ootheca length 8–12 mm, n=5 (Rauscher, in litt.).

Conservation: Least concern. Common in the natural habitats of its areas of occurrence.

Family Eremiaphilidae Saussure, 1869

Traditionally, Eremiaphilidae comprised only the subfamily Eremiaphilinae. However, Schwarz & Roy (2019) expanded the family by adding the subfamilies: Iridinae, Parathespinae and Tarachodinae. "Eremiaphilidae distinguished from other eremiaphiloid groups by an apomorphic reduction of the anterior lobe of phalloid apophysis (afa). In most taxa, it is totally lost (figs 12d–h, j, 13a–g - in the original paper), but very small remnants are visible, e.g., in *Dysaules* (fig. 12i) and *Paralygdamia* (fig. 13h)" (Schwarz & Roy 2019: 143). Ma *et al.* (2023), based on mitogenomic analyses, argue for the paraphyly of Eremiaphilidae in which Iridinae and Tarachodinae formed a clade with Toxoderidae. Concerning the Eremiaphilinae, Ma *et al.* (2023: 653) remarked: "The phylogenetic position of *Eremiaphila* derived from our mitogenomic analyses may need to be further assessed given that the anatomical metathoracic morphology of *Eremiaphila* clearly differed from other earless mantodeans".

Subfamily Iridinae Westwood, 1889
Genus *Iris* Saussure, 1869
עֵין־חָשֶׁת

The is a xerothermic genus widespread in the Mediterranean basin, western and central Asia and in arid and semi-arid areas of Africa (Battiston *et al.* 2010; Wieland 2013). Male macropterous, female brachypterous. The genus comprises 14 species (Otte *et al.* 2023). Three species are recorded from Israel, two of which are new records.

Iris oratoria (Linnaeus, 1758)
Figs 7D, F, 13I, J, 29A–F, 68J, Map 9

עֵין־חָשֶׁת מְפֹאָר

Body length: ♂ 38.0–53.0 mm, ♀ 34.0–47.0 mm.

Material examined: Israel: *Mount Hermon*: 1♀, Majdal Shams, 31.viii.1984, A. Freidberg; 1♂, Newe Ativ, 28.viii.1981, A. Freidberg; 1♂, Newe Ativ, 29.viii.1981, A. Freidberg; *Golan Heights*: 1♀, Mezudat Nimrod, 29.x.1968, Ayal *et al.*; 1♂, Nahal Yarmukh, 18.x.1943, Y. Palmoni; 1♂, Qazrin, 7.ix.1981, J. Kugler; 1♀, Ramat haGolan, 9.ix.2005, Y. Ptashkovsky; *Upper Galilee Hills*: 1♂, Har Meron, 10.v.1976, A. Freidberg; 2♂, Tel Hay, 22.vii.1959, L. Fishelsohn; *Sea of Galilee area*: 1♂, Teverya (Tiberias), 10.ix.1967, R. Ben Kiki; *Karmel (Carmel) Ridge*: 1♂, Bat Shelomo, 2.viii.1991, A. Shlagman; *Central Coastal Plain*: 1♀, Ilanot, 26.vi.2020, A. More Yossef; 1♀, Taibe (7km NE 'En Harod), 22.viii.1938, Y. Palmoni; 1♂, Tel Aviv, 1.x.1931, F.S. Bodenheimer; *Southern Coastal Plain*: 1♀, Be'er Toviyya, J. Wahrman; 1♀, Giv'at Homera Nature Reserve, 1.i.2016, A. Weinstein; 1♀, Holot Rishon leZiyyon, 9.viii.2018, A. Weinstein; *Judean Hills*: 1♀, Arza, 5.xi.1942, Y. Palmoni; 1♂, Etanim, 26.x.1948, M. Sternlicht; 1♀, HaMasreq Nature Reserve, 2.xi.1965, S. Blondheim; 1♀, Jerusalem, 19.x.1930, H. Bytinski-Salz; 1♀, Jerusalem, 25.x.1933; 1♂, Jerusalem, 1.ix.1941, H. Bytinski-Salz; 1♀, Jerusalem, 1.x.1941, H. Bytinski-Salz; 1♀, Jerusalem, 9.xi.1941; 1♀, Jerusalem, 9.vii.1949, J. Wahrman; 1♀, Jerusalem, 4.viii.1949, J. Wahrman; 1♂, Jerusalem, 3.ix.1952; 1♀, Jerusalem, 3.ix.1954, J. Wahrman; 1♂, Jerusalem, 18.ix.1954, J. Wahrman; 1♂, Jerusalem, 4.ix.1956, J. Wahrman; 1♀, Jerusalem, 6.ix.1956, Y. Werner; 1♀, Jerusalem, 27.viii.1957, A. Gabay; 1♂, Jerusalem, 27.viii.1957, A. Weissman; 1♀, Jerusalem, 29.x.1957, Y. Werner; 1♂, Jerusalem, 12.x.1958, Y. Werner; 1♂, Jerusalem, 21.ix.1963, H. Pener; 1♂, Jerusalem, 18.viii.1964, S. Blondheim; 1♀, Jerusalem, 11.vi.1965, S. Blondheim; 1♀, Jerusalem, 16.ix.1965, J. Wahrman; 1♀, Jerusalem, 19.ix.1965, J. Wahrman; 1♀, Jerusalem, 8.xi.1965, S. Blondheim; 1♂, Jerusalem, 2♀, Mehlaf Qastel, 12.x.1952, J. Wahrman; 1♀, Qiryat 'Anavim, 10.xi.1942, H. Bytinski-Salz; *Dead Sea Area*: 1♂, 'En Tamar, 30.vi.2016, A. Weinstein; 1♀, Sedom, 8.xii.1954, P. Amitai; *Northern Negev*: 1♂, Be'er Milka, 28.vii.2020, G. Sinaiko; 1♀, Nevatim, 22.x.1958, A. Shulov; 1♂, Revivim, 16.x.1954, J. Wahrman; 1♂, Revivim, 2.viii.1958, J. Krystal; *Central Negev*: 1♀, Bor Mashash, 18.iv.1984, I. Yarom; 2♀, Borot Loz, 27.vii.1992, D. Rauscher; 1♂, Borot Loz, 30.vi.2016, A. Weinstein; 1♂, 1♀, Nahal Boqer, 15.viii.1983, E. Shney-Dor; 1♀, Nahal Boqer, 30.viii.1986, O. Shnayder; 1♂, Park Yeroham, 21.x.1962, M.P. Pener *et al.*; 1♀, Sede Boqer, 9.xii.2010, G. Wizen; 1♂, Sede Boqer, 2.x.2018, B. Shalmon; 1♂, Sede Boqer, 25.v.2021, A. Weinstein; 1♂, Yeroham, 25.viii.1965, J. Wahrman; 2♂, Yeroham, 30.ix.2015, Y. Zvik; 1♂, Yeroham, 22.ix.2016, Y. Zvik; 1♀, Yeroham, 1.x.2018, A. Weinstein; 1♂, 1♀, Yeroham, 1.x.2018, D. Simon; *'Arava Valley*: 1♀, Elat (Eilat Ornithological Park), 21.vii.2018, A. Weinstein (all SMNHTAU).
Upper Galilee Hills: 1♂, Metulla, 20.ix.1931, A. Flumberg; *Judean Hills*: 1♀, Jerusalem, 1.xi.1921, P. A. Buxton; *Northern Negev*: 1♂, Be'er Sheva', 14.viii.1949, H. Bytinski-Salz (all PPIS).
Yizre'el (Jezreel) Valley: 1♀, Oranim, 24.xii.1959, Ch. Sandler; *Shomeron (Samaria)*: 1♀, Gal'ed (Even Yizhaq), 21.x.1953 (all OQT).

General distribution: Algeria, Chad, Croatia, Cyprus, Egypt, France, Greece, India, Iran, Israel, Italy, Jordan, Lebanon (https://inaturalist.org/observations/30822598), Morocco, Spain, Syria, Tunisia, Turkey, North America (introduced).

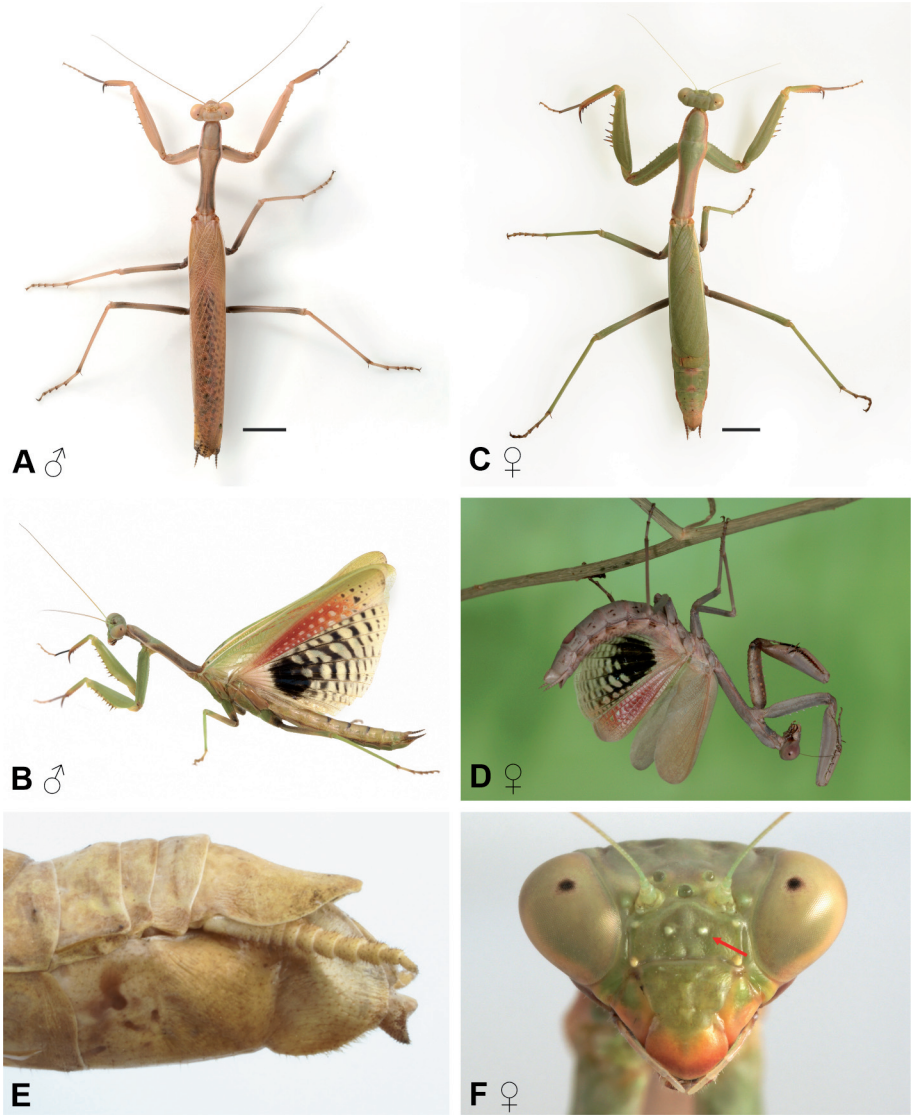


Fig. 29. *Iris oratoria*: (A) Sede Boqer, 27.viii.2021, ♂ live, habitus, dorsal view; (B) Yeroham, 2.x.2018, ♂ live, habitus, deimatic display; (C) Yeroham, 2.x.2018, ♀ live, habitus, dorsal view; (D) 283923, 'En Tamar, 22.x.2015, ♀ live, habitus, deimatic display; (E) ♀ live, abdomen lateral view, terminalia; (F) Yeroham, 2.x.2018, ♀ head details; scale bar = 5 mm.

Records in Israel: Throughout the geographic areas of Israel. Buxton and Uvarov (1923) noted that it is uncommon, Bodenheimer (1925: 7) agreed with this statement, but noted that "…wherever it is found it is seen in large quantities". At present, *I. oratoria* is widespread from the most southern point, near the city of Elat (Elat Ornithological Park), throughout the Negev highlands and up to the Upper Galilee and Golan Heights. The wide distribution, especially in arid areas, can be attributed to anthropogenic influences such as urbanization and agricultural and tourism developments.

Biological notes: Inhabits warm areas rich in vegetation. Adults and nymphs are often seen on shrubs and trees. The ootheca (length: 17.0–23.0 mm, n=4) (Rauscher, in litt.) is typically deposited on tree bark and rocks (Fig. 68J). Possesses two color morphs: a green shade and a yellow-gray shade.

Conservation: Least concern. Common in the natural habitats of its areas of occurrence.

Iris deserti Uvarov, 1923

Figs 6A, 13G, H, 30A–F, 68K, Map 9

עֵין־קֶשֶׁת סַהֲרָה

Body length: ♂ 28.0–30.0 mm, ♀ 38.0–54.0 mm.

Material examined: Israel: *Northern Negev*: 1♀, Be'er Milka, 24.x.2023, N. Michaeli; 1♀, Zomet haNegev, 7.v.2020, A. More Yossef; *Central Negev*: 1♀, Horbat Mamshit, 21.v.2020, A. More Yossef; 1♂, Horbat Mamshit, 15.vi.2020, A. More Yossef; 4♂, 1♀, Horbat Mamshit, 1.v.2021, A. More Yossef; 1♀, Nahal Besor, 4.v.2020, A. Buskila (all SMNHTAU).

General distribution: Israel **(**new record), Algeria (type locality), Chad, Tunisia.

Records in Israel: Central Negev, Northern Negev.

Biological notes: Associated with arid sandy habitats (Fig. 67A), with shrubs such as *Artemisia monosperma* Delile (Asteraceae) and *Retama raetam* (Forssk.) Webb & Berthel (Fabaceae). While all the specimens found in Israel were green-shaded, Karsakoff (1935*b*) referred to two color morphs (both from southern Algeria): a bluish green and a sandy yellow. Detailed life history, reproduction behavior, descriptions of nymphs and adults and illustrations presented in Karsakoff (1935*a*, 1935*b*).

Conservation: Near threatened. Considered rare. Only four specimens were collected during 2020–2023. Localized geographic distribution. Vulnerable – fragmented habitats, anthropogenic developments and activities in the Negev areas are significant threats at the local level (Sorek *et al.* 2018).

Notes: Described by Uvarov (1923) from specimens collected from sandy habitats in the Algerian Sahara (Ain Sefra, alt. ~1000 m and Ain Guettara, alt. 650 m). Until the current study, it was known only from western North Africa. The first specimens of *I. deserti* from Israel are known only from photographic records:

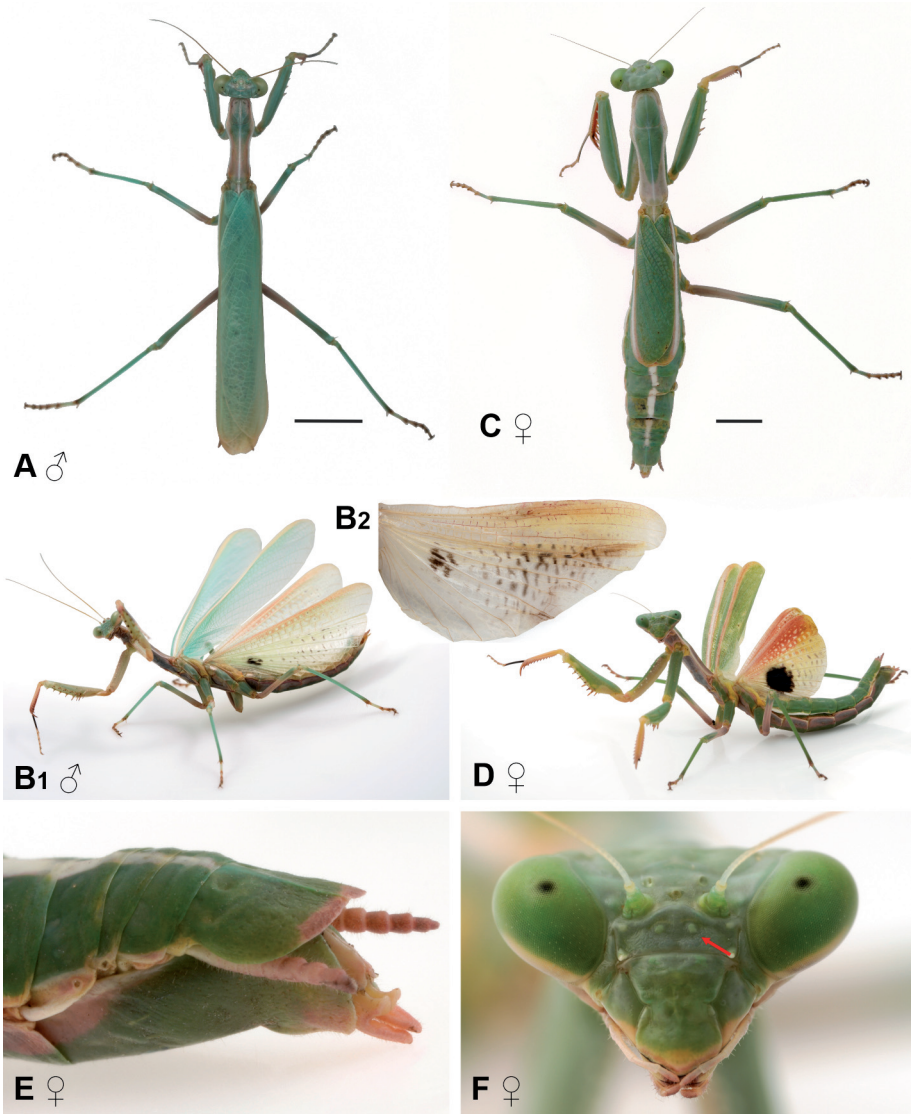


Fig. 30. *Iris deserti*: (A) Horbat Mamshit, vi.2021, reared ♂ live, habitus, dorsal view, (B1) deimatic display, (B2) hind wing; (C) 356607, Horbat Mamshit, 21.v.2020, ♀ live, habitus, dorsal view; (D–F) 356608, Zomet haNegev, 7.v.2020, ♀ live: (D) habitus, deimatic display; (E) same data, abdomen and terminalia, lateral view; (F) same data, head; scale bar = 5 mm.

a nymph showing the typical transverse postclypeus (frontal sclerite, Fig. 30F) from Holot Mash'abim Nature Reserve (June 2015, Amir Weinstein, pers. obs.) and an adult from Mamshit (April 2018, Ofer Itamar, https://www.facebook.com/

photo/?fbid=10215886623269633). Three females were collected in the Central Negev (April and May 2020) from three different sites (alt. 300–480 m). No males were found in the field during the study period. Fortunately, one female (May 2020, Avi More Yossef) that deposited an ootheca in captivity enabled the raising of five males to adults. These males were important for identification, as the females superficially resemble *Iris polystictica* Fischer-Walheim 1846, whereas the males greatly differ from it (Fig. 30A, B). An additional female collected in Be'er Milka area (May 2023, Noah Michaeli) deposited two oothecae (Fig. 68Ka). A dorsal white strip on the female tergite (Fig. 30D) and a dorsal white line on the male pronotum (Fig. 30A) serve for easy distinction from other local *Iris* spp.

The discovery of *I. deserti* in Israel is credited to nature enthusiasts who photographed unidentified mantids and shared images on Facebook social media (The Israeli Group of Arthropods, Reptiles and Amphibian photography) (Facebook. 2024*a*). This case demonstrates how citizen-science can help bring attention to new species, even in regions that are considered well-explored.

Iris caeca Uvarov, 1931

Figs 13K, L, 31A, B, Map 9

עֵין־קֶשֶׁת עַבְרוֹנָה.

Body length: ♂ 38.0–44.0 mm.

Material examined: Israel: *'Arava Valley*: 1♂, 'En 'Avrona, 17.viii.2017, B. Shalmon; 1♂, 'En 'Avrona, 18.ix.2017, N. Segev; 1♂, Timna', 21.ix.1957, J. Wahrman; 1♂, Timna', 3.vii.1981, B. Shalmon **(**all SMNHTAU).

General distribution: Israel (new record), Egypt, Saudi Arabia, Sudan (type locality), Yemen.

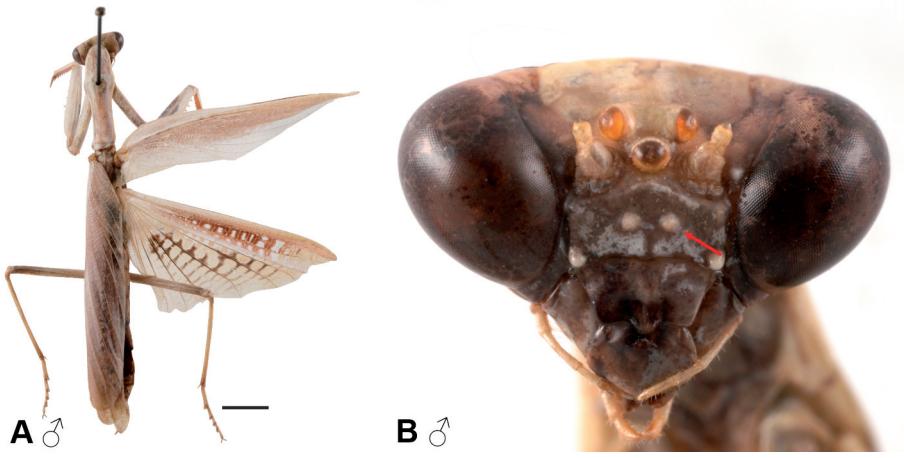
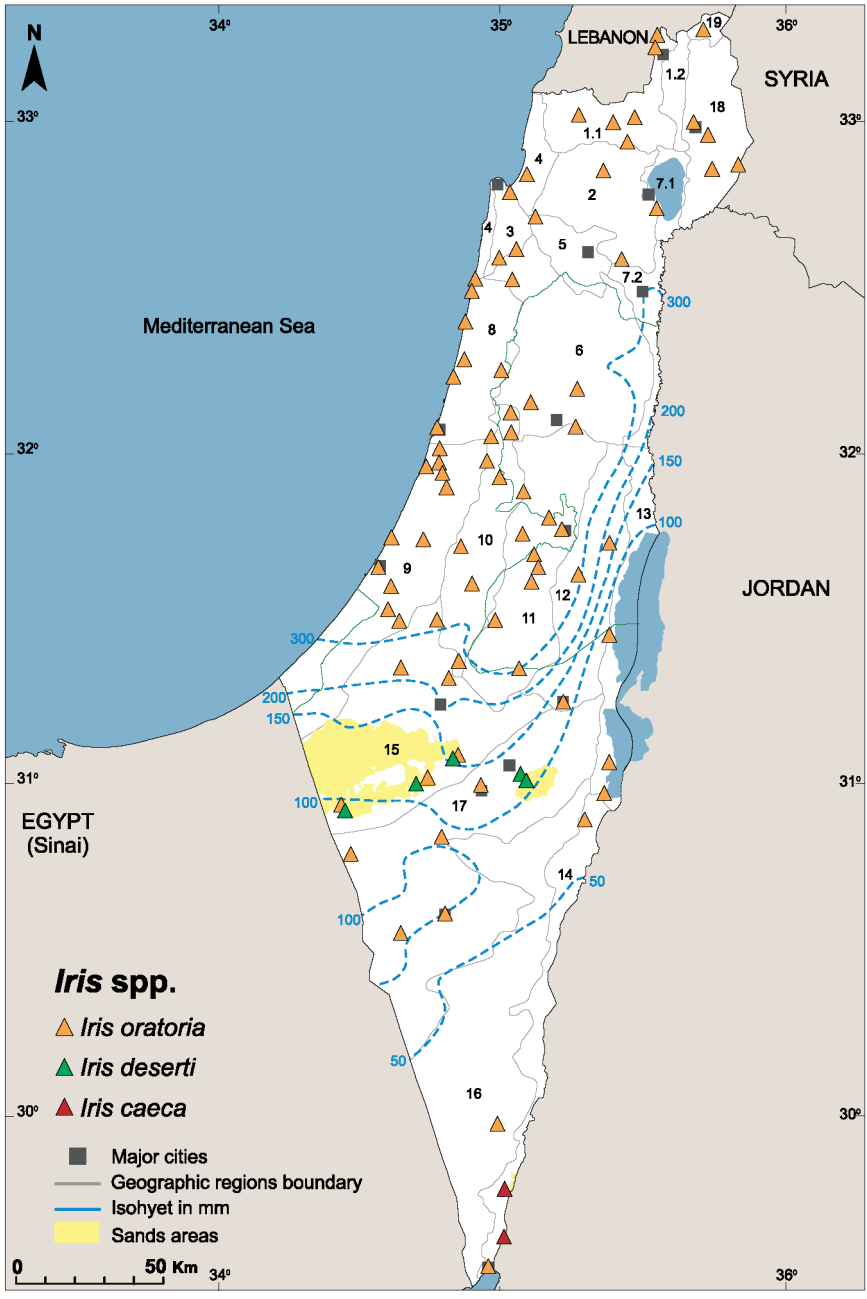


Fig. 31. *Iris caeca*, 283914, 'En 'Avrona, 17.viii.2017, ♂: (A) habitus, dorsal view; (B) head.



Map 9. *Iris* spp., distribution in Israel.

Records in Israel: Southern part of 'Arava Valley: found only in the saline of the 'Avrona Nature Reserve and the Timna' Nature Reserve, probably the northernmost records for this species. This is a hyper-arid area (Map 1, region 14), with summer temperatures regularly above 40˚C and with a low annual precipitation (less than 30 mm) (Bruins *et al.* 2012).

Conservation: Vulnerable. Considered rare. Localized geographic distribution. Only four specimens, all males, have been collected in recent years. Its vulnerability is most probably the result of habitat fragmentation, anthropogenic developments and activities in 'Avrona and Timna' areas (Ben-Natan 2013).

Notes: *Iris caeca* inhabits the Sahel region of Sudan and Arabia but invades as far as the Siwa Oasis in northwestern Egypt. It can, therefore, be described as an Afro-Sahelian faunal element (Kaltenbach 1982). Until the present study, this species was not collected in Israel. The earlier photo of a male and a female from the Siwa Oasis, Egypt is presented in Uvarov (1943: 29).

Subfamily Eremiaphilinae Saussure, 1869

Eremiaphilinae inhabit stony and sandy deserts and semi-arid regions (Ehrmann 2011) in North Africa, the Levant and as far east as Pakistan and India (Ehrmann 2002; Wieland 2013; Wieland & Svenson 2018). Eremiaphilinae comprise two genera: *Eremiaphila* Lefebvre, 1835 with 64 species and *Heteronutarsus* Lefebvre, 1835 with four species (Otte *et al.* 2023). *Heteronutarsus* remains unrecorded from Israel. *H. aegyptiacus* Lefebvre, 1835 is known from Egypt (west of the Suez Canal) and Libya (Battiston *et al.* 2010). During the present study we located an *Heteronutarsus* specimen (Fig. 32A–C: E[ast] of Suez, 4.i.1971, coll. D. Simon, D54, HUJI), collected in the sand dunes on the eastern bank of the Suez Canal (El Qantara area, Sinai). In this site *Heteronutarsus* individuals have been observed running across the dunes; when threatened they have been burying themselves vertically in the sand by rapidly shaking their legs until only the tips of their eyes have been visible above the sand. After burrowing into the sand, quick movements of the antennae were removing the sand revealing the eyes (D. Simon, pers. obs.). To the best of our knowledge, this is the first report of sand-burrowing behavior in mantids.

Heteronutarsus has four tarsomeres in the forelegs and three tarsomeres in the mid and hind legs (compared to *Eremiaphila*, which has 5:5:5). Tarsomere reduction probably represents an adaptation to speedy running on sandy surfaces, attaining higher velocity by stiffening the tarsi (Wieland 2013). The tarsal claws of the mid and hind legs are particularly thick and unequal in length; the inner claw is much shorter than the outer claw (Lefebvre 1835), which may be an adaptation for digging in the sandy soil.

Fig. 32. *Heteronutarsus aegyptiacus*: (A–C) D54, HUJI collection, Egypt, Sinai, east Suez, 4.i.1971, col. Dany Simon: (A) dorsal view; (B) dorsal view, enlarged; (C) hind tarsus; scale bar = 10 mm and 1 mm.

Genus *Eremiaphila* Lefebvre, 1835

Figs 8D, E, 68C

מְדַבְּרָן

Eremiaphila comprises about 46 species (Battiston *et al.* 2010) exhibiting a South Palaearctic distributional pattern. The genus constitute one of the most characteristic elements of the desert fauna of the Mediterranean region (Chopard 1938), widespread mostly in the arid and semi-arid regions of the Middle East, North Africa and the Arabian Peninsula. The genus exhibits a pattern of endemism, which can be explained by the fact that both sexes are brachypterous. *Eremiaphila* mantids are cursorial and highly agile (Chopard 1938). They are mostly active during the day on bare ground, even when surface temperatures reach 60–62°C (near Yeriho (Jericho), 1924, Buxton). Their "run and stop" tactic and camouflaged cryptic body coloration make it difficult for observers or predators to maintain eye contact. Some species have individuals that occur naturally in several color variants, with each variant being optimally adapted to a specific shade of coloring and texture on the desert floor (Figs 33C, 34D, 36C).

Eremiaphila are adapted for actively seeking prey (Chopard 1938), with their diet typically consisting of ground-dwelling insects such as ants and termites. Roonwal (1938) remarked: "An examination of the stomach contents showed that the principal food of the mantid consists of ants". They will not hesitate to consume conspecifics. *Eremiaphila* use their wings in deimatic displays (Figs 33D, 34C, 36D, 37B, C).

The courtship behavior of *Eremiaphila brunneri* was reported by Govorov (2019). The ootheca is deposited in the soil. Females have terminal spikes on the last abdominal sternite, which they use for digging a furrow into the soil to lay their ootheca below ground. The depth of the furrow is 10–15 mm. Particles of soil clump together on the sticky ootheca (Fig. 68C) adding physical protection and camouflage (Adair 1913; Brackenbury 1999; Liske *et al.* 1999; Wieland 2008; Wieland & Svenson 2018; Rauscher, in litt.).

The taxonomy of this genus is complicated and unclear. Many species are known only from type specimens and brief descriptions. Genitalia in this genus are mostly unknown and no cladistic or other analyses have ever been undertaken. A revision of this genus is highly needed (Kaltenbach pers. comm. 1992; Battiston *et al.* 2010).

During this work, we were able to identify five species that can be separated morphologically relatively easily. Three of the five species were found at the same sites, sometimes at the same time, not far from each other. Werner (1905) reported similar observations from Egypt. Due to the complexity of the genus and the inability to compare material with collections in adjacent countries, it is possible that additional species may be present, particularly in the border areas.

The literature attributes two additional species to Israel: *Eremiaphila rufipennis* Uvarov, 1929 (Type: Wadi Tarfa, St. Katherine, Sinai, Egypt) and *Eremiaphila uvarovi* Bodenheimer, 1933 (Type: Ma'an, Jordan). However, during the study we were unable to confirm the presence of both species in Israel. Ehrmann (1996) listed *E. rufipennis* from Egypt and Israel. Filser and Prasse (2008) recorded *E. rufipennis* from Nizzana Sands, stating that the specimen was determined by Ehrmann. Nizzana Sands is a sandy area in the Western Negev along the border with Egypt, being a completely different habitat from the rocky area of the Wadi Tarfa. However, this record cannot be verified, as the deposit location of the specimen from Nizzana is unknown. We were unable to find *E. rufipennis* and *E. uvarovi* neither in the SMNHTAU collection nor in other collections in Israel.

Eremiaphila arabica Saussure, 1871

Figs 9J–L, 33A–D, 37D, Map 10

מַדְבְּרָן עֲרָבִי

Body length: ♂ 28.0–30.0 mm, ♀ 36.0–38.0 mm.

Material examined: Israel: *Judean Desert*: 1♀, 'Arad, 5.ix.1964, P. Amitai; 1♀, Ma'ale Adummim, 13.vi.1942; *Dead Sea Area*: 1♀, 'En Tamar, 11.iv.1963, M.P. Pener *et al.*; *Northern Negev*: 1♀, Karmit, V. Kravchenko; 1♀, Ashalim, 15.iv.2021, A. More Yossef; 1♀, Ashalim, 27.iv.2021, A. More Yossef; 2♀, Be'er Sheva', 1.ix.1942, Oeaigh; 1♀, Be'er Sheva', 15.xii.1942, H. Bytinski-Salz; 1♀, Mash'abbe Sade, 2.x.2018, B. Shalmon; 1♀, Mash'abbe Sade, 1.i.2022, A. More Yossef; 1♀, Nahal Sidra, 20.v.1954, R. Freund; 1♂, Nahal Sidra, 20.v.1954, R. Freund; 2♀, Ne'ot Hovav, 2.x.2018, A. Weinstein; 1♀, Ne'ot Hovav, 2.x.2018, B. Shalmon; 1♂, 1♀, Revivim, 25.v.1950, J. Wahrman; 1♀, Revivim, 7.vi.2015, B. Shalmon; 1♀, Revivim, 1♀, Zomet haNegev, 19.vi.2020, A. More Yossef; 1♀, Zomet haNegev, 25.vi.2020, A. More Yossef; 1♀, Zomet haNegev, 29.vii.2020, A. More Yossef; *Central Negev*: 1♀, 'En Mor, 30.i.1959, M. Dor; 1♀, Makhtesh Ramon, 21.x.1974, A. Freidberg; 1♀, Mishor haRuhot, 16.x.1949, J. Wahrman; 1♀, Nahal Boqeq, 27.iii.1958, M. Dor; 1♂, Nahal Boqer, 30.v.1957, O. Yarkoni; 1♀, Nahal Neqarot, 28.iv.1952; 2♀, Nahal Ramon, 25.iv.1950, J. Wahrman; 1♀, Nahal Ramon, 25.iv.1952; 1♂, Sede Boqer, 4.vi.1953; 1♂, 1♀, Yeroham, 19.x.1949, J. Wahrman; 1♂, Yeroham, 11.iv.1963, M.P. Pener *et al.*; 1♀, Yeroham, 23.vi.1963, M.P. Pener & S. Blondheim; 1♂, Nahal Hiyyon, 9.iv.1955, Y. Werner; *Southern Negev*: 1♀, Nahal Hiyyon, 11.iv.1958, Ch. Lewinsohn; 1♀, Nahal Shitta, 7.vii.2020, T. Simon; *'Arava Valley*: 1♀, Elat, 1.iv.1957, L. Fishelsohn; 1♀, 'En 'Avrona, 21.xi.2017, B. Shalmon; 1♀, 'En Hazeva, 22.iv.1946, H. Bytinski-Salz; 1♂, 'En Hazeva, 25.iii.1950, J. Wahrman; 1♀, 'En Hazeva, 15.v.1953; 1♀, 'En Hazeva, 5.iv.1972; 1♀, Nahal Paran, 14.xi.1975, B. Shadmot; 1♀, Nahal Paran, 10.x.2019, B. Shalmon; 1♂, Nahal Shezaf Nature Reserve, 22.iii.2013, S. Talal; 1♂, Nahal Shezaf Nature Reserve, 6.xi.1999, V. Kravchenko; 1♂, Yahel, 21.vi.1950, J. Wahrman (all SMNHTAU).

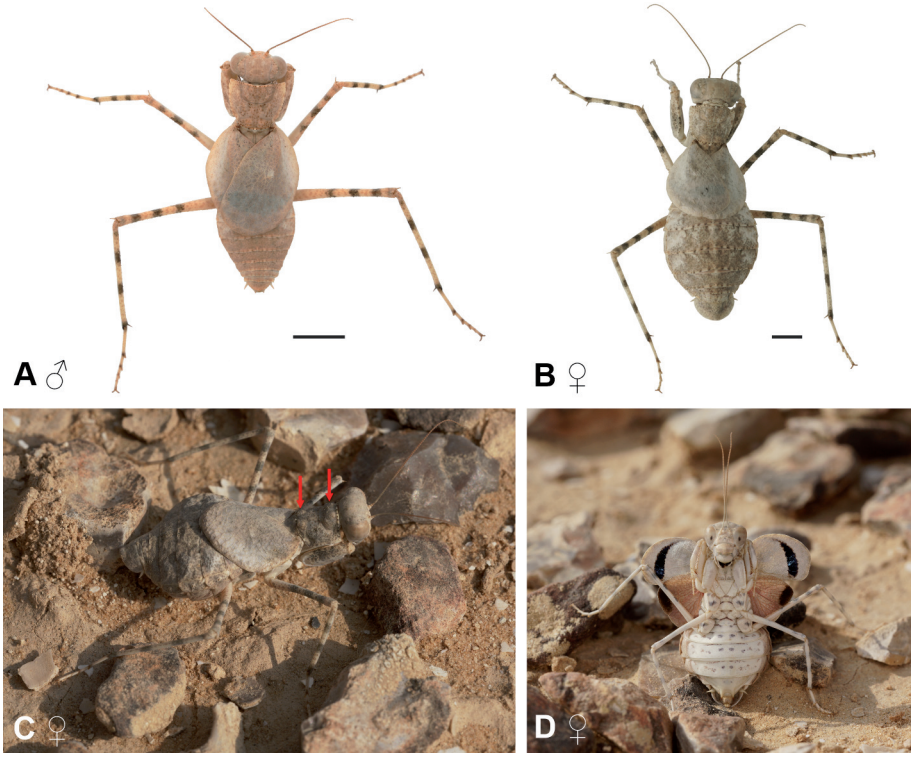


Fig. 33. *Eremiaphila arabica*: (A) Central Negev, iv.2021, ♂ live, habitus, dorsal view; (B) Mash'abbe Sade, 2.x.2018, ♀ live, habitus, dorsal view; (C, D) Mash'abbe Sade, 2.x.2018, ♀ live: (C) habitus, (D) deimatic display; scale bar = 5 mm.

Northern Negev: 1♂, Haluza, 20.iv.1954, H. Bytinski-Salz; *Central Negev*: 1♀, Nahal Ramon, 24.iv.1952, Kaufmann; *'Arava Valley*: 1♀, En 'Avrona, 21.ii.1951, Kirsch; 1♀, Paran, 1.xii.1954 (all PPIS).

Dead Sea Area: 1♂, 'En Tamar, 2.iii.1958; *Northern Negev*: 1♀, Nahal Ruhama, 5.iv.1960, Ch. Sandler; *Central Negev*: 1♀, Avedat, 1.iv.1962, Ch. Sandler; 1♀, Giv'at Zafit, 22.iv.1977, A. Albershtin; 1♂, Mishor Yamin, 2.iv.1956; *Southern Negev*: 1♀, Be'er 'Ada, 4.iv.1963; 1♀, Biq'at Sayyarim, 7.iv.1956; 1♀, Biq'at 'Uvda, 16.iv.1966, Ch. Sandler; 1♂, 'En Netafim, 16.iv.1955; *'Arava Valley*: 1♂, 1♀, 'En Hazeva, 19.iv.1946; 1♂, 'En Hazeva, 14.iv.1954; 1♂, 'En Shahaq, 24.x.1964, Ch. Sandler; 1♂, Yotvata, 9.iv.1969, Ch. Sandler (all OQT).

General distribution: Egypt, Iran, Israel, Saudi Arabia (type locality), Yemen.

Records in Israel: Central Negev, Dead Sea Area, Judean Desert, Northern Negev, Southern Negev, 'Arava Valley.

Biological notes: On bare gravel plains (Reg), in desert hills or beside wadi banks (Fig. 67E–G)

Conservation: Least concern. Common in the natural habitats of its areas of occurrence.

Notes: Described by Saussure (1871) from Jeddah (Saudi Arabia). Werner (1905) redescribed this species as *E. dawydowi* (Wadi-el-Begga, SW of the Dead Sea, apparently referring to Nahal Boqeq). The largest *Eremiaphila* species in Israel.

Eremiaphila brunneri Werner, 1905

Figs 9A, 34A–D, 37F, Map 10

מִדְבָּרָן שְׁחֹר־כָּתֶם

Body length: ♂18.0 –21.5 mm, ♀ 21.5–29.0 mm.

Material examined: Israel: *Shomeron (Samaria)*: 1♂, Nahal Tirza, 11.vii.1967, M.P. Pener *et al.*; *Southern Coastal Plain*: 1♂, Nezer Sereni, 10.vii.1955, J. Halperin; 1♂, Sederot, 24.vi.2020, A. Weinstein; 1♂, Sederot, 28.viii.2020, A. Weinstein; *Judean Foothills*: 1♀, Lahav, 7.ix.1960, M.P. Pener ; 1♂, Lahav, 19.viii.1961, O. Freund; 2♂, 3♀, Lahav, 30.viii.1961, M.P. Pener *et al.*; 1♀, Lahav, 4.vi.1963, M.P. Pener & S. Blondheim; *Judean Hills*: 1♀, Horbat Karme, 11.x.1967, G. Tsabar; 1♀, Horbat Karme, 12.x.1967, S. Blondheim & G. Tsabar; 1♀, Jerusalem, 9.xi.1941; 1♀, Jerusalem, 17.xi.1941, H. Bytinski-Salz; 1♀, Jerusalem, 1.ix.1942, H. Bytinski-Salz; 1♂, Jerusalem, 27.viii.1949, J. Wahrman; 2♂, Jerusalem, 28.viii.1949, J. Wahrman; 1♀, Jerusalem, 28.ix.1949, J. Wahrman; 1♀, Jerusalem, 1.ix.1950, J. Halperin; 1♂, Jerusalem, 18.viii.1952, P. Amitai; 1♂, Jerusalem, 18.viii.1952, E. Swirski; 1♀, Jerusalem, 14.xi.1971, H. Lewnony; 1♀, Jerusalem, 14.xi.1971, Y. Levanony; *Judean Desert*: 1♀, 'Arad, 9.vi.1961, A. Markuza; 1♀, 'Arad, 4.vi.1963, M.P. Pener & S. Blondheim; 2♀, 'Arad, 7.vi.1963, M.P. Pener & S. Blondheim; 1♂, 'Arad, 12.ix.1967, E. Zlotkin; 1♀, Ma'ale Adummim, 13.vi.1973, Faunistics; 1♀, Mizpe Yeriho, 18.vii.1932, H. Bytinski-Salz; 1♀, Mizpe Yeriho, 18.vii.1942, H. Bytinski-Salz; 1♀, Teqoa', 27.x.1967, P. Amitai *et al.*; *Dead Sea Area*: 1♂, Dead Sea, 31.vii.1938, Y. Palmoni; 2♀, Nahal Perat, 18.ix.1967, M. P. Pener & M. Broza; 1♂, Qalya, 16.viii.1938, H. Bytinski-Salz; 1♂, 1♀, Qalya, 16.viii.1939, H. Bytinski-Salz; 1♀, Qalya, 15.xii.1944, H. Bytinski-Salz; 1♂, Qalya, 7.vii.1967, A. Shulov *et al.*; 1♂, Yeriho (Jericho), 7.vii.1942, Y. Palmoni; 1♂, Yeriho (Jericho), 7.vii.1942; 1♀, Yeriho (Jericho), 16.vii.1942, H. Bytinski-Salz; 1♀, Yeriho (Jericho), 14.x.1943, H. Bytinski-Salz; 1♀, Yeriho (Jericho), 29.xii.1943; 2♀, Yeriho (Jericho), 17.viii.1945, H. Bytinski-Salz; *Northern Negev*: 1♀, Ashalim, 5.ix.2021, A. More Yossef; 1♂, Be'er Sheva', 5.vii.1946, H. Bytinski-Salz; 1♂, Be'er Sheva', 15.v.1955, A. Weissman; 1♀, Be'er Sheva', 1.vi.1956, J. Halperin; 1♀, Be'er Sheva', 19.vi.2020, A. More Yossef; 1♂, Be'er Sheva', 21.vii.2020, A. More Yossef; 3♀, Devira, 7.viii.1962, Y. Levy; 1♂, Lehavim, 15.vi.2022, A. More Yossef; 1♂, Mash'abbe Sade, 10.ix.1958, A. Shulov; 1♂, 1♀, Mash'abbe Sade, 19.vi.2020, A. More Yossef; 1♂, Mash'abbe Sade, 29.vii.2020, A. More Yossef; 2♂, Ne'ot Hovav, 2.vii.2019, A. Weinstein; 1♀, Shivta junction, 26.viii.2020, A. More Yossef; 1♀, Telalim, 7.vi.2015, B. Shalmon; 1♂, Zomet haNegev, 1.vii.2020, A. More Yossef; 1♀, Zomet haNegev, 15.vii.2022, A. More Yossef; 1♀, Zomet Telalim, 1.ix.1988, E. Saney-Dor; *Central Negev*: 1♀, 'Avedat, 8.ix.1957, Y. Werner; 1♀, Be'er Hagar, 24.vi.1941, H. Bytinski-Salz; 1♂, Be'er Hagar, 24.vi.1941, H. Bytinski-Salz; 1♀, HaMakhtesh haGadol, 16.vi.1986, T. Feller; 1♀, HaMakhtesh haQatan, 16.vi.2020, A. More Yossef; 1♀, Har Saggi, 1.ix.1982, J. Wahrman; 1♀, Horbat Mamshit, 16.vi.2020, A. More Yossef; 1♂, Horbat Mamshit, 18.vi.2020, A. More Yossef; 1♀, Horbat Mamshit, 19.vi.2020, A. More Yossef; 1♀, Nahal Boqer, 13.vi.1986, E. Shney-Dor; 1♂, Nahal Boqer, 15.viii.1987, E. Saney-Dor; 1♂, Nahal Hatira, 21.vi.1972, F. Nachbar; 1♀, Nahal Hatrurim, 25.x.1949, J. Wahrman; 1♀, Nahal Hatrurim, 20.ix.1950, J. Wahrman; 1♀, Nahal Hatrurim, 29.ix.1950, J. Wahrman; 1♀, Nahal Lavan, 10.iii.1954, J. Wahrman; 1♀, Nahal Loz, 17.x.1949, J. Wahrman; 5♀, Nahal Nafha, 18.viii.1957, J. Wahrman; 1♀, Nahal Ramon, 25.x.1954, J. Wahrman; 1♂, Nahal Ramon, 13.viii.1956, J. Wahrman; 1♂, Nahal Ramon, 5.vi.1957, J. Wahrman; 1♀, Nahal Ramon, 15.ii.1962, B. Bramson; 1♀, Nahal Sekher, 26.ix.1959, M.P. Pener ; 2♀, Nahal Zafit, 9.vi.1950, J. Wahrman; 1♂, 1♀, Nahal Zavoa', 24.vi.2020, B. Shalmon; 1♀, Sede Boqer, 1.viii.1957, J. Wahrman; 2♀, Tel Yeroham, 18.vii.1955, J. Wahrman; 1♀, Tel Yeroham, 14.viii.1956, J. Wahrman; 1♀, Yeroham, 26.ix.1959, P. Amitai; *Southern Negev*: 1♀, Nahal Roded, 15.xi.2015, B. Shalmon; 1♀, Nahal Shelomo, 14.iv.1955, L. Fishelsohn; 1♀, Nahal Shitta,

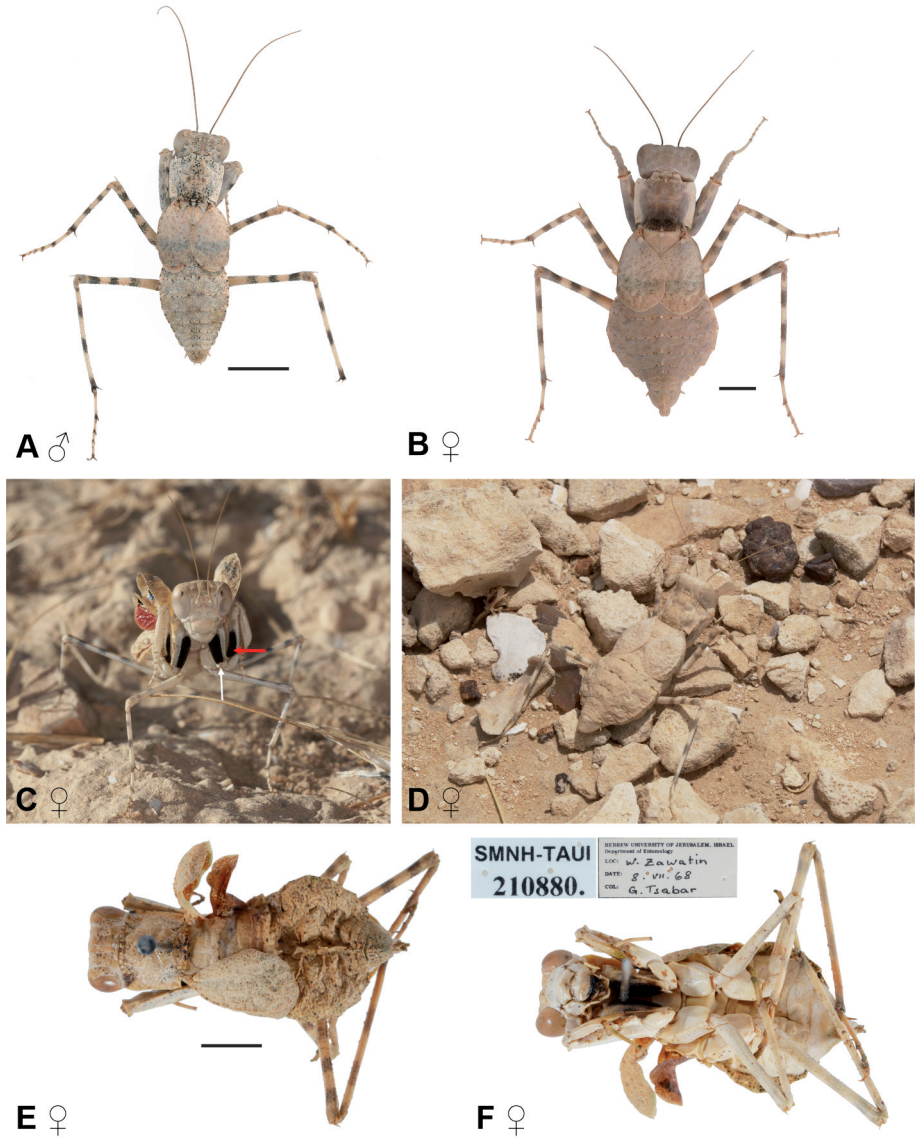


Fig. 34. *Eremiaphila brunneri*: (A) 35668, Sederot, 24.vi.2020, ♂ live habitus, dorsal view; (B) 356609, Nahal Shitta, 7.vii.2020, ♀ habitus, dorsal view; (C) Sede Boqer, 30.vi.2016, ♀ live, habitus, deimatic display; (D) Mash'abbe Sade, 7.vi.2015, ♀ live, habitus; (E, F) 210880, Egypt, Sinai, Wadi Zawatin, 8.vii.1968, ♀ habitus: (E) dorsal view; (F) ventral view; scale bar = 5 mm.

7.vii.2020, A. Weinstein; *'Arava Valley*: 1♀, Elat, 7.iv.1957, M. Dor; 1♀, Elat, 4.x.1960, J. Margalit; 1♀, Elat, 15.xii.1961, M. Dor; 1♀, Elat, 1.ii.1982, A. Shmida; 1♂, 'En 'Avrona, 16.xi.2016, B. Shalmon; 2♀, 'En 'Avrona, 13.ix.2017, N. Segev; 1♀, Nahal Paran, 11.iv.1954, J. Wahrman; 1♀, Nahal Shezaf Nature Reserve, 4.xi.1997, A. Maklakov; 1♂, Nahal Shezaf Nature Reserve, 9.vii.2020, A. Weinstein; 1♂, Qetura, 9.ix.2020, L. Friedman; 1♂, Samar, 18.viii.2016, A. Weinstein; 1♂, Samar, 8.vii.2020, A. Weinstein; 1♂, Timna', 16.iii.1950, J. Wahrman; 1♀, Timna', 13.vi.1950, J. Wahrman; 1♀, Timna', 11.iv.1963, Y. Kolrom; 1♀, Yotvata, 4.v.1989, A. Eitam; 1♀, Yotvata, 20.viii.2022, B. Shalmon; 1♀, Yotvata, 21.viii.2022, B. Shalmon; 1♀, Yotvata (Hay Bar) Nature Reserve, 8.xi.2016, B. Shalmon; 1♀, Yotvata (Hay Bar) Nature Reserve, 27.v.2020, B. Shalmon (all SMNHTAU).

General distribution: Israel (type locality). Endemic (see Notes).

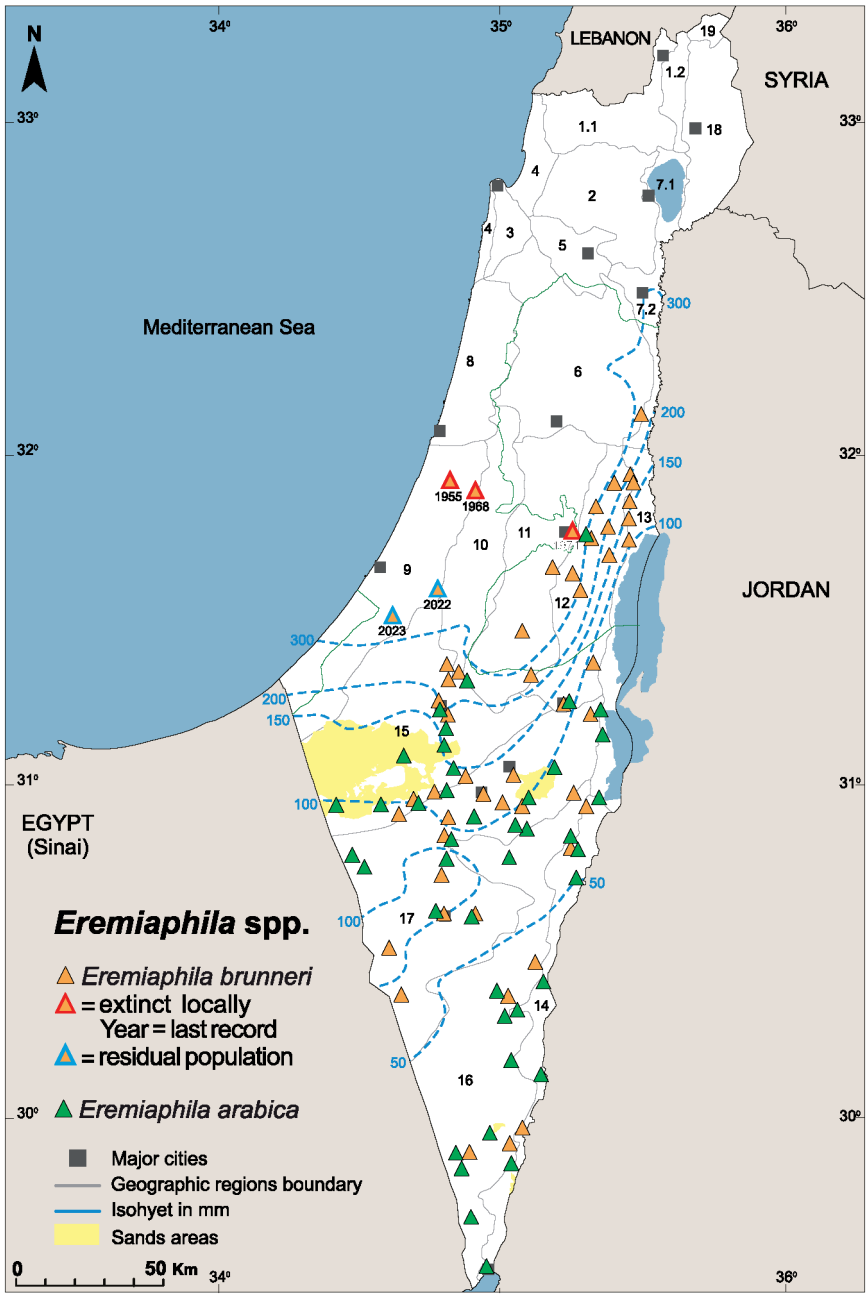
Records in Israel: Central Negev, Dead Sea Area, Jordan Valley (?), Judean Desert, Judean Foothills, Judean Hills, Northern Negev, Shomeron (Samaria), Southern Coastal Plain, Southern Negev, 'Arava Valley.

Biological notes: In variable habitats throughout the Negev, the Judean desert and up to the eastern slopes of Samaria. The typical habitat is gravel plain (Reg and Loess soils), in or near wadis or on the bare hills (Fig. 67B, D–G).

Conservation: Least concern. The most widespread species of the genus in Israel. Common in the arid areas but very rare in the Mediterranean areas, where its natural habitats decline.

Notes: Described by Werner in 1905 from a single female that was collected by Brunner von Wattenwyl in the Jerusalem area during the late 19th century. During the present study we located in the SMNHTAU collection one specimen of *Eremiaphila* cf *brunneri* from the southern highlands of the Sinai Peninsula (Egypt) (Fig. 34E, F, SMNHTAU In.210880, Wadi Zawatin, 8.vii.1968, G. Tsabar). The presence of *E. brunneri* in Sinai requires additional support from future collecting efforts. We assume this species is also present in Jordan.

Bodenheimer (1935*c*: 151) remarked: "Sie ist die bei weitem häufigste *Eremiaphila*-Art Palästinas. Am steinigen Fuße der Kalkhügel (B.E.) ist sie überaus zahlreich, fehlt aber auch auf der reinen Lehmebene (A.E.) nicht, wie Buxton angibt. Sie huschen blitzartig liber den Boden dahin, dessen Farbung und Zeichnung sie vollig angenommen haben und sind nur an den Bewegungen ihres eigenen Schattens kenntlicli. Auf den Beobachtungsflächen bei Jericho <…> lag die beobachtete Bodentemperatur meist zwischen 36-45° C in der Sonne, zwischen 22–38°C im Schatten. Auch bei Temperaturen von 50-68° C in der Sonne wurde noch viermal Aktivität gesehen, bei 25° C in der Sonne lag die niederste beobachtete Tätigkeit" [It is by far the most common *Eremiaphila* species in Palestine. It is exceedingly numerous at the stony foot of the limestone hills (Jericho), but is also present on the pure clay plain (Jordan Riverbanks), as Buxton < (Buxton 1924: 126) > indicates. It is not absent even on the plain of pure clay. They scurry like lightning across the ground, whose coloring and markings they have completely adopted and are only recognizable by the movements of their shadows. On the observation plots near Yeriho (Jericho) <…>, the observed soil temperature was mostly between 36–45°C in the sun and between 22–38°C in the shade. The activity was also seen



Map 10. *Eremiaphila arabica* and *Eremiaphila brunneri*, distribution in Israel.

several times at temperatures of 50–68°C in the sun. The lowest observed activity was at 25°C in the sun].

During our survey in June 2020, a small relic population was found in the western Negev, near the town of Sederot – the most western record of this species; this became possible thanks to Benny Woodoo, who drew our attention to this population. A few specimens were collected from small clearings on a Kurkar (Ramleh) rock relic low hill characterized by dense Mediterranean vegetation. This area is under massive urban development and during 2021–2022 the site, including the hill, was leveled and the mantid population is now extinct.

One specimen collected by Avi More Yossef in June 2022 near Qiryat Gat is currently the only reliable record from the Foothills of Judea. More northern records are known in the northern part of the Southern Coastal Plain (SMNHTAU In.210697, Nezer Sereni, 10.vii.1955, and SMNHTAU In.210858, west to 'Azarya, 27.vii.1968). The habitats at these locations recently are not typical for this species and we were not able to clarify the records due to both the exact collection points being unknown and the changes in the area following massive urbanization and the development of agriculture.

Eremiaphila brunneri was collected in the western (Mediterranean) part of Jerusalem – Mt Herzl area – during the 1930s–1950s. The last records from this area date to 1971 from the Qiryat Menahem Quater. However, during the current study we did not find any evidence of this species in the western part of the Jerusalem area. It is likely that it is now extinct due to the urbanization and artificial afforestation that has taken place over the last 70 years.

This is a large species, can be easily identified by the dark color of the ventral surface of the anterior coxa and femora (Figs 9A, 34C). This character appears in both nymphs and adults.

Eremiaphila bovei Lefebvre, 1835

Figs 9B, C, 35A–D, Map 11

מִדְבָּרָן פָּעוּט

Body length: ♂ ~11.0–15.0 mm, ♀ ~15.5–21.5 mm.

Material examined: Israel: *Judean Foothills*: 1♀, Lahav, 14.vi.2020, A. More Yossef; *Judean Desert*: 1♀, 'Arad, 18.ix.1967, S. Blondheim & Cohen; 1♀, 'Arad, 4.x.1993, E. Gliksberg; *Northern Negev*: 1♂, Be'er Sheva', 27.viii.1952, J. Wahrman; 1♀, Be'er Sheva', 18.viii.1955, M.P. Pener ; 3♀, Mash'abbe Sade, 24.viii.1965, J. Wahrman; 1♂, Mash'abbe Sade, 2.x.2018, A. Weinstein; 1♂, 3♀, Ne'ot Hovav, 2.vii.2019, A. Weinstein; 1♀, Ne'ot Hovav, 16.vi.2020, A. Weinstein; 2♀, Ne'ot Hovav, 26.vi.2020, A. Weinstein; 1♀, Ne'ot Hovav, 2.x.2020, A. Weinstein; 1♂, Tel 'Arad, 7.x.1993, E. Gliksberg; 3♀, Telalim, 7.vi.2015, A. Weinstein; 3♀, Telalim, 7.vi.2015, B. Shalmon; 1♂, Telalim, 15.vi.2022, A. More Yossef; *Central Negev*: 2♂, 1♀, Dimona, 18.viii.1957, J. Wahrman; 1♀, Horbat Mamshit, 24.vi.2020, B. Shalmon; 1♂, Irus Yeroham Nature Reserve, 24.vi.2020, B. Shalmon; 1♂, Mishor haRuhot, 16.x.1949, J. Wahrman; 1♀, Mishor Yamin, 3.vi.1953; 1♂, Nahal Nafha, 18.viii.1957, J. Wahrman; 1♂, Nahal Sekher, 26.ix.1959, P. Amitai; 1♀, Nahal Sekher, 30.v.1968, M.P. Pener *et al.*; 1♀, Nahal Sekher, 17.vii.1985, A. Freidberg; 1♂, Sede Zin, 30.viii.1981, B. Shalmon; 1♂, Yeroham, 25.vi.2020, A. Weinstein (all SMNHTAU).

Northern Negev: 1♂, Be'er Sheva', 1.viii.1957 (OQT).

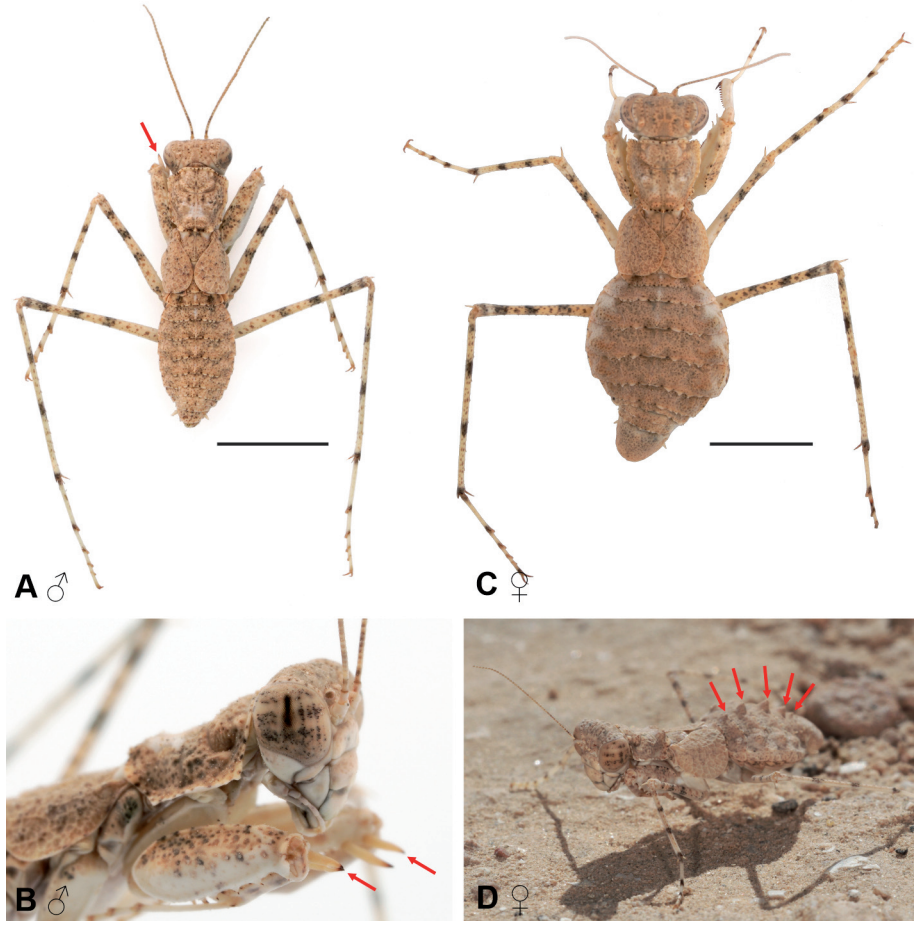


Fig. 35. *Eremiaphila bovei*: (A) Irus Yeroham Nature Reserve, 24.vi.2020, ♂ habitus, dorsal view; (B) Be'er Milka, 30.vii.2019, raptorial leg details; (C) Ne'ot Hovav, vii.2020, ♀ live, habitus; (D) upper Nahal Zin, 30.vii.2016, ♀ live, habitus; scale bar = 5 mm.

General distribution: Israel (new record), Chad, Egypt (type locality).

Records in Israel: Central Negev, Judean Desert, Judean Foothills, Northern Negev, 'Arava Valley (?).

Biological notes: Found on bare gravel plains (Reg and Loess soils), near or on gravelly, low chalk mounds, as well as along the slopes of low hills**.**

Conservation: Near threatened. While common in most of the natural habitats of its areas of occurrence, these habitats face fragmentation and increasing pressure

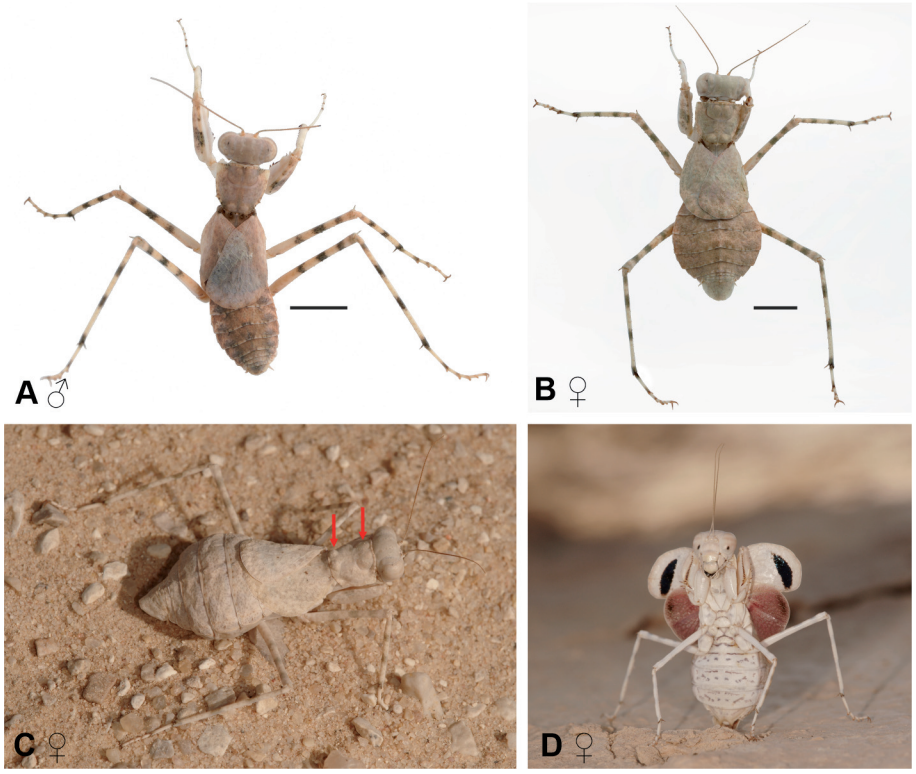


Fig. 36. *Eremiaphila braueri*: (A, B) Samar sands, 7.vii.2020: (A) ♂ live, habitus dorsal view; (B) same data, ♀ live, habitus dorsal view; (C, D) Samar sands 13.v.2011: (C) ♀ live, habitus; (D) sama data, deimatic display; scale bar = 5 mm

from anthropogenic developments and activities such as expansive solar energy fields, agriculture and industrial developments.

Notes: Uvarov (1929) remarked: "Described and known only from Suez (Egypt, Sinai)". The smallest *Eremiaphila* of the five species. The adult male is easily distinguished by two prominent long apical spines on the anterior of the front femora (Figs 9C, 35B).

Eremiaphila braueri Krauss, 1902

Figs 9G–I, 36A–D, 37E, Map 11

מִדְבְּרָן עַרְבָה

Body length: ♂ 21.0–22.5 mm, ♀ 23.5–28.5 mm.

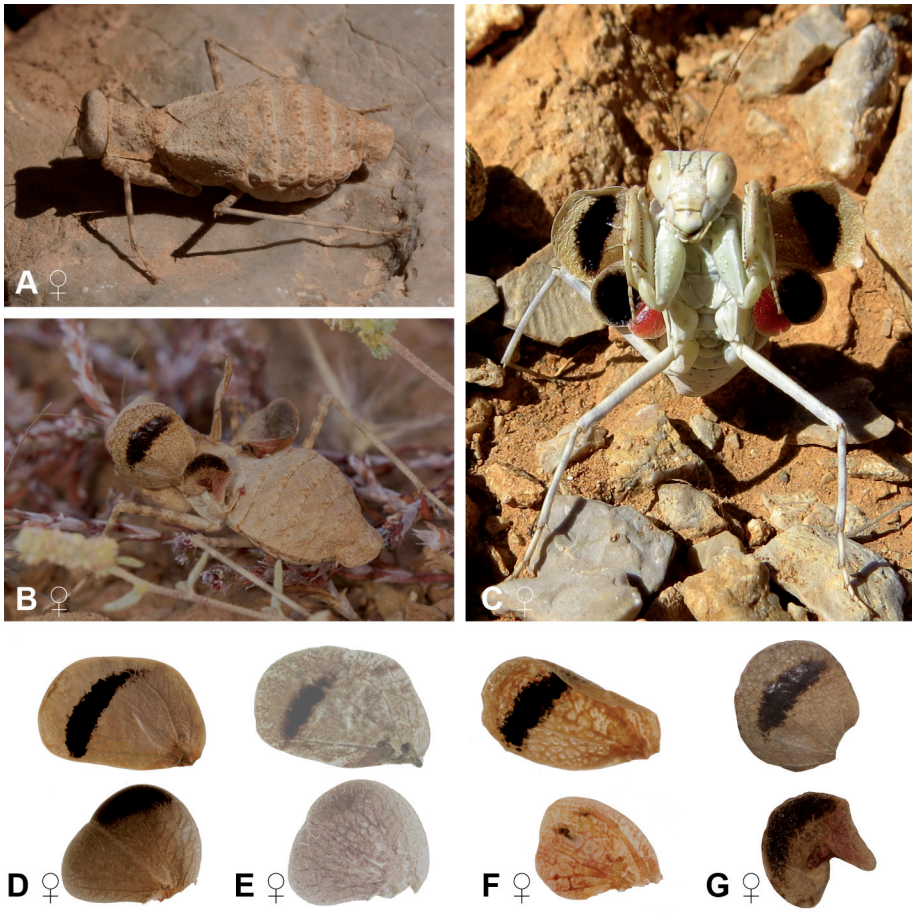


Fig. 37. (A–C) *Eremiaphila genei*: (A) Mt Hermon, 12.viii.2015, ♀ live, habitus; (B) sama data, deimatic display; (C) Mt Hermon, 27.viii.2018, ♀ live, habitus, deimatic display. (D–G) Fore and hind wings of: (D) *Eremiaphila arabica,* ♀; (E) *Eremiaphila braueri,* ♀; (F) *Eremiaphila brunneri,* ♀; (G) *Eremiaphila genei*, ♀.

Material examined: Israel: *Southern Negev*: 1♀, Nahal Roded, 15.xi.2015, B. Shalmon; 1♀, Nahal Shelomo, 14.iv.1955, L. Fishelsohn ; *'Arava Valley*: 1♀, Elat, 7.iv.1957, M. Dor; 1♀, Elat, 4.x.1960, J. Margalit; 1♀, Elat, 15.xii.1961, M. Dor; 1♀, Elat, 1.ii.1982, A. Shmida; 1♂, 'En 'Avrona, 16.xi.2016, B. Shalmon; 2♀, 'En 'Avrona, 13.ix.2017, N. Segev; 1♀, Nahal Paran, 11.iv.1954, J. Wahrman; 1♂, Samar, 18.viii.2016, A. Weinstein; 1♂, Samar, 8.vii.2020, A. Weinstein; 1♂, Timna', 16.iii.1950, J. Wahrman; 1♀, Timna', 13.vi.1950, J. Wahrman; 1♀, Timna', 11.iv.1963, Y. Kolrom; 1♀, Yotvata, 4.v.1989, A. Eitam; 1♀, Yotvata, 20.viii.2022, B. Shalmon; 1♀, Yotvata, 21.viii.2022, B. Shalmon; 1♀, Yotvata (Hay Bar) Nature Reserve, 8.xi.2016, B. Shalmon; 1♀, Yotvata (Hay Bar) Nature Reserve, 27.v.2020, B. Shalmon (all SMNHTAU).

Southern Negev: 1♀, 'En Netafim, 16.iv.1955; *'Arava Valley*: 1♀, Be'er Ora, 20.xi.1962 (OQT).

General distribution: Israel (new record), Jordan, Kuwait, Oman, Saudi Arabia, Socotra (type locality), United Arab Emirates, Yemen.

Records in Israel: Southern Negev, southern 'Arava Valley.

Biological notes: Specimens are seen active primarily on the margins of wadis, on gravel plains and on the hard crusts of soil composed of sand mixed with silt or small gravel.

Conservation: Near threatened. Considered locally rare. Localized geographic distribution, probably the northernmost world record of this species. Vulnerable and fragmented habitats due to anthropogenic developments and activities along the southern 'Arava Valley.

Notes: First described from Socotra Island. Later it was found in the Arabian Peninsula and in the eastern desrts of Jordan (Abu-Dannoun 2006). A large species. An illustration of the ventral surface of the hind wing is provided in Uvarov (1939*a*, 548: fig. 11*b*).

Eremiaphila genei Lefebvre, 1835

Figs 9D–F, 37A–C, G, Map 11

מִדְבָּרָן חֶרְמוֹנִי.

Body length: ♂ 14.0–15.0 mm, ♀ 17.0–25.0 mm.

Material examined: Israel: *Mount Hermon*: 2♂, 2♀, Mt Hermon, 27.vii.1967, L. Fishelsohn; 1♂, Mt Hermon, 28.vii.1967, L. Fishelsohn; 1♂, 2♀, Mt Hermon, 20.viii.1967, Nitsan; 1♂, Mt Hermon, 23.vii.1968; 1♀, Mt Hermon, 5.x.1968, J. Kugler; 1♀, Mt Hermon, 18.vii.1972, J. Kugler; 1♀, Mt Hermon, 18.vii.1972, M. Kaplan; 1♀, Mt Hermon, 30.vii.1973; 1♀, Mt Hermon, 18.viii.1973, M. Kaplan; 1♂, Mt Hermon, 7.viii.1974, M. Kaplan; 1♀, Mt Hermon, 16.viii.1976, A. Freidberg; 1♂, 1♀, Mt Hermon, 2.viii.1982, I. Yarom; 5♂, Mt Hermon, 2.vii.1984, A. Freidberg; 1♂, Mt Hermon, 24.vii.1985, A. Freidberg; 1♂, Mt Hermon, 24.vii.1985, I. Yarom; 1♀, Mt Hermon, 11.vi.1991, D. Rauscher; 1♂, 4♀, Mt Hermon, 12.viii.2015, D. Simon; 1♀, Mt Hermon (all SMNHTAU).

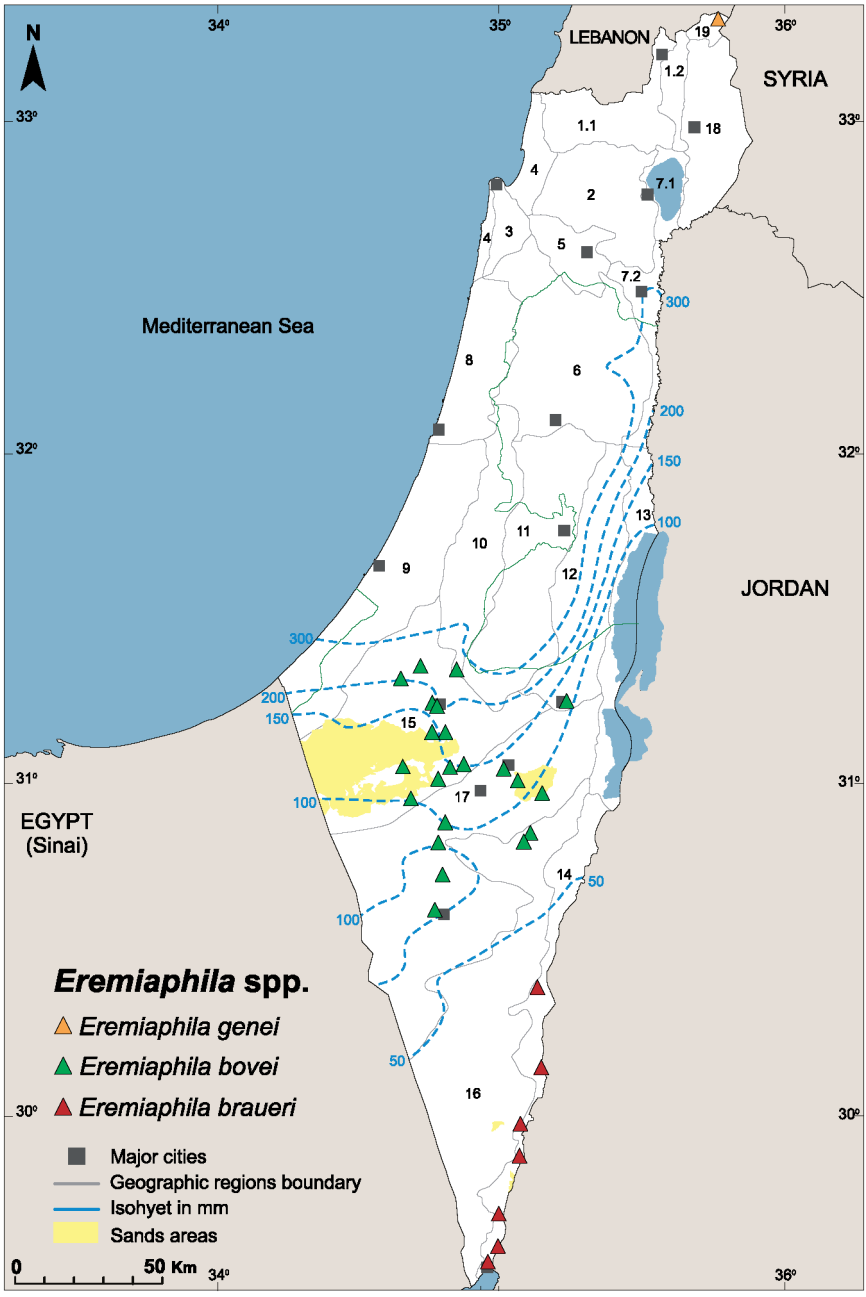
Mount Hermon: 1♀, Mt Hermon, 10.x.1967, Ch. Sandler; 1♀, Mt Hermon, 29.v.2005, M. Broza (all OQT).

General distribution: Afghanistan, Armenia, Egypt, Iran, Israel, Jordan, Lebanon (Mt Lebanon), Saudi Arabia, Syria (type locality), Turkey, Yemen.

Records in Israel: Mount Hermon.

Biological notes: Known locally in Israel from Mt Hermon, where it inhabits open stony or gravelly ground in rocky areas (Fig. 65A) at altitudes of approximately 1600 m and above. The Hermon ridge is a semi-arid alpine habitat, icy in the winter and hot and dry in summer. In this area *E. genei* overwinters in the egg stage.

Conservation: Endangered. Very localized geographic distribution. Fragmented habitat. Over the years, due to massive civilian and military development, vast natural areas in the Israeli part of the Hermon have been destroyed and the future of this population is unclear.



Map 11. *Eremiaphila genei*, *Eremiaphila braueri* and *Eremiaphila bovei*, distribution in Israel.

Notes: Giglio-Tos (1893) reported that Festa collected *E. genei* at various locations, including Mt Hermon (east side, alt. 1800 m), Anti-Lebanon mountains (alt. 1500 m), in the vicinity of Sabura (Al-Sabboura) in Syria (alt. ~500 m) and in Yeriho (Jericho) (alt. -300 m) near the Dead Sea. Werner (1905) also referred to the Dead Sea, but noted that this locality was only a general reference point rather than an exact location. Furthermore, our search of the SMNHTAU collection records did not yield any evidence of *E. genei* specimens from the Dead Sea area or from the lower Jordan Valley.

Given the wide global distribution of this species across various climate regions and ecological conditions and its limited dispersal abilities, it is possible that this species may actually represent a complex of several species. Consequently, it will be necessary in the future to use molecular methods to clarify the exact identity of the local species.

Family Toxoderidae Saussure, 1869

The Toxoderidae are a group of elongated, slender and often bizarre, species that, in the case of some Toxoderini species, reach a body length of up to 160 mm Roy 2009; Wieland & Svenson 2018). The Toxoderidae currently encompass 130 species and subspecies in 25 genera, widespread in the Afrotropical and Oriental Regions (Wieland & Svenson 2018; Otte *et al.* 2023). We list seven species in five genera occurring in Israel, most of them rarely observed and their biology nearly unknown.

Although the diet of the Toxoderidae is unknown, Wieland (2013), Schütte & Wieland (2014) and Wieland and Svenson (2018) assume that the secondary elongation of the tibia and overall foreleg morphology, at least in the Toxoderini, could indicate a putative adaptation to feeding on Lepidoptera or other large-winged insects. We agree with this assumption for some of the local species, as we have observed them feeding both in the field and in captivity.

Subfamily Heterochaetinae Brunner von Wattenwyl, 1893
Genus *Heterochaeta* Westwood, 1843

עַנְפָן

The genus is widespread in sub-Saharan Africa. (Battiston *et al.* 2010) and comprises 11 species (Otte *et al.* 2023) in semi-deserts, savannas and equatorial forest (Roy 1987). Only *H. pantherina* is known outside of the tropical Africa.

Heterochaeta pantherina (Saussure, 1872)

Figs 15A, B, 38A–D, Map 12

עַנְפָן פַּנתֵרִי

Body length: ♂ 84.0–90.0 mm, ♀ 98.0–99.0 mm.

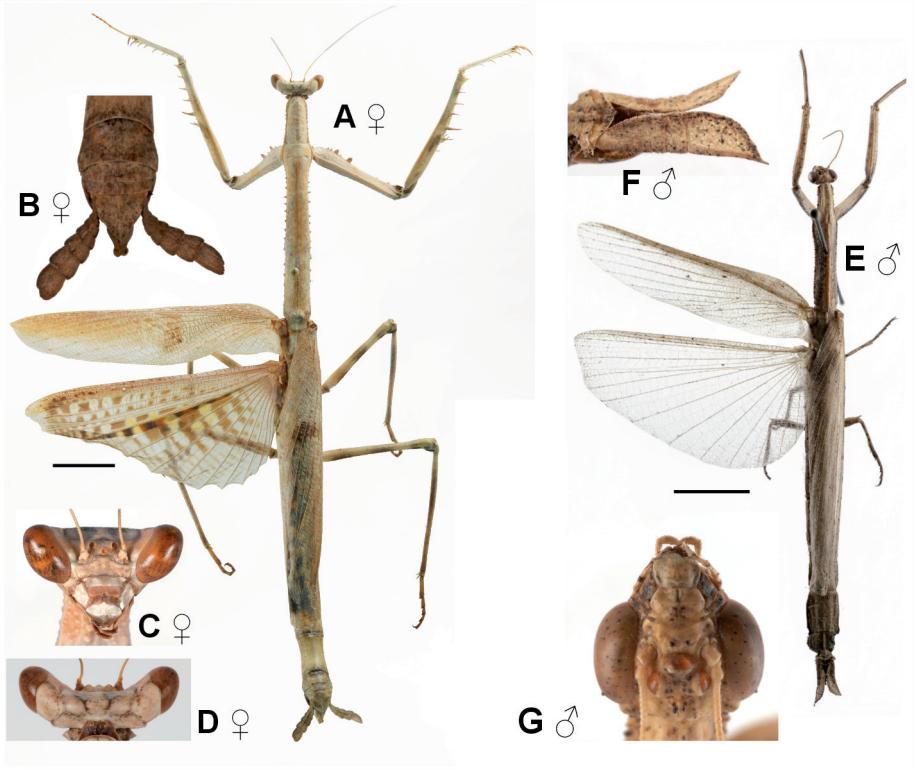


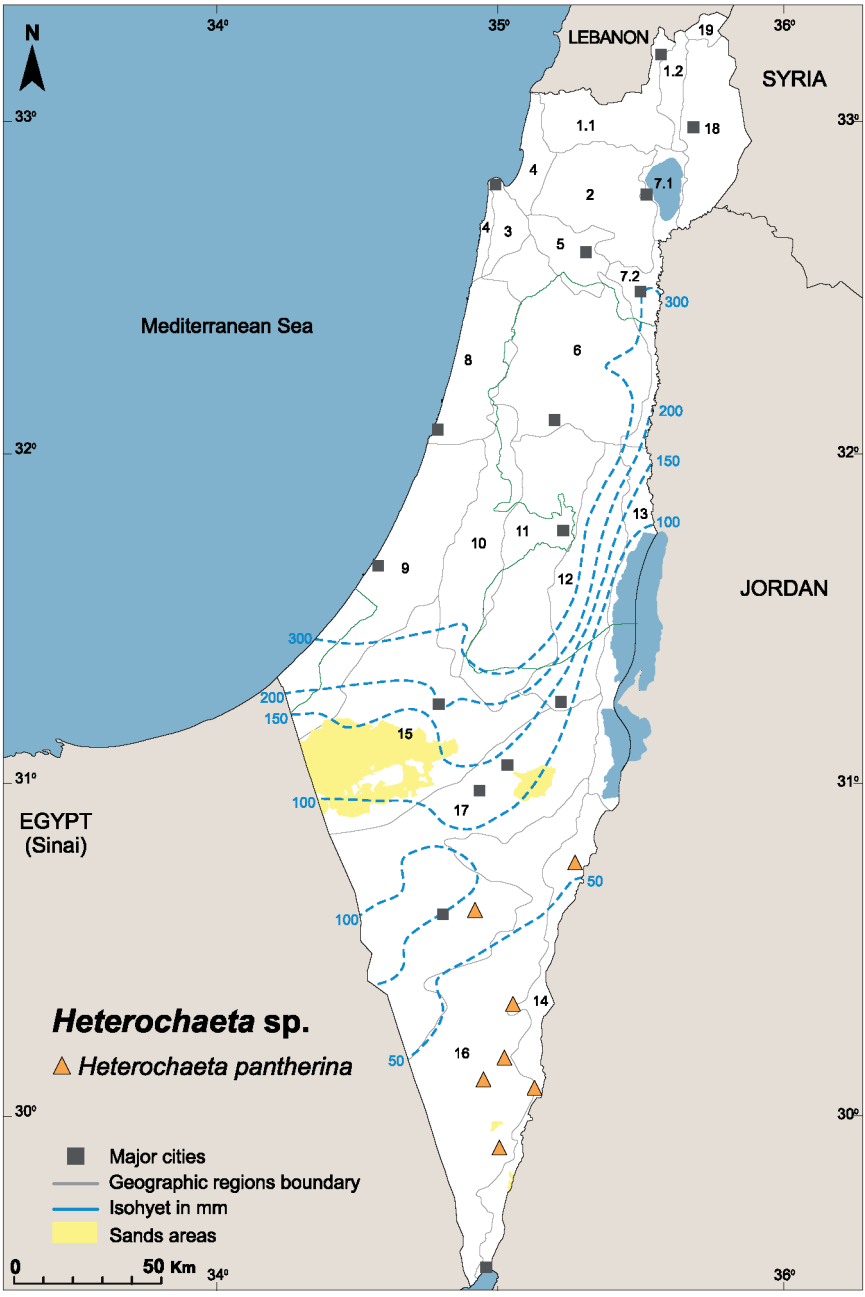
Fig. 38. (A–D) *Heterochaeta pantherina*, 233834, Nahal Paran, 1.vii.1976, ♀: (A) habitus, dorsal view; (B) posterior part of the abdomen; (C) head, dorsal view; (D) face; (E–G) *Roythespis israelensis*, 233830, 'En Yahav, 28.iv.1952, ♂: (E) 233830, 'En Yahav, 28.iv.1952, ♂ habitus; (F) 233830, 'En Yahav, 28.iv.1952, ♂ posterior part of the abdomen; (G) 233828, Hazeva Field School, 29.v.1998, ♂ head, dorsal view; scale bar = 10 mm.

Material examined: Israel: *Central Negev*: 1♀, Makhtesh Ramon, 27.ii.1993, J. Cnaani; *'Arava Valley*: 1♀, Hazeva, 5.vi.1991, A. Ionescu; 1♀, Nahal Paran, 1.vii.1976; 1♀, Yahel, 20.v.1969, G. Tzabar (all SMNHTAU).

General distribution: Israel (new record), Angola, Chad, Djibouti, Egypt, Mauritania, Niger, Saudi Arabia, Somalia, Sudan, Yemen.

Records in Israel: Central Negev, 'Arava Valley.

Biological notes: This species seems to be associated with large wadis featuring acacia and *Tamarix* trees (Fig. 67F–G). Ehrmann (1996) recorded an adult female collected in Egypt on *Tamarix*; a nymph was found on an acacia (Egypt: Sinai: Wadi Watir, 16.iii.1979, B. Shalmon, pers. obs.); and a nymph was observed on the ground near *Tamarix* in the 'Arava Valley (Hazeva, iii.2007, A. Weinstein, pers. obs.). Both sexes are macropterous. Adults are attracted to artificial light.



Map 12. *Heterochaeta pantherina*, distribution in Israel.

Conservation: Near threatened. Considered locally rare. Patchy and localized geographic distribution. Only four specimens from Israel and one from Sinai (Egypt) are deposited in the SMNHTAU.

Notes: Kaltenbach (1982) considered this species to be a Sahelian-East-African element. Most of the local records are from the 'Arava Valley. This species was not collected during the present study.

Subfamily Oxyothespinae Giglio-Tos, 1916
Genus *Sinaiella* Uvarov, 1924

עַנְפָן

This xerothermophilic genus is widespread from Egypt (Sinai) through Arabian Peninsula to Iran and Armenia (Battiston *et al.* 2010; Kolnegari *et al.* 2025). There are four known species. *Sinaiella nebulosa* Uvarov, 1924, *Sinaiella sabulosa* Uvarov, 1939, *Sinaiella raggei* Kaltenbach, 1991 (Battiston *et al.* 2010), and the most recently described *Sinaiella azadi* Kolnegari & Schwarz, 2025 (Kolnegari *et al.* 2025). Kolnegari *et al.* (2025) provided key to all known *Sinaiella* species.

Sinaiella nebulosa Uvarov, 1924

Figs 14L–N, 39A–E, 68I, Map 13

עַנְפָן צִיָּה

Body length: ♂ 32.0–36.0 mm, ♀ 36.0 mm.

Material examined: Israel: *Northern Negev*: 1♀, Telalim, 15.vii.2022, A. More Yossef; 1♀, Telalim, 7.xi.2022, A. More Yossef; *Central Negev*: 1♂, 'En 'Avedat, 31.x.2023, O. Rittner; 1♂, Qezi'\'ot, 1.x.1990, D. Simon; *'Arava Valley*: 1♂, Hazeva, 5.vi.1991, A. Ionescu; 1♂, 'Iddan, 5.xi.1999, V. Kravchenko; 1♂, Nahal Gidron, 26.v.2021, D. Simon; 1♂, Nahal Gidron, 10.vi.2021, D. Margalit; 1♂, Nahal Gidron, 22.xi.2022, D. Margalit; 1♂, Nahal Shitta, 16.vi.1999, I. Yarom & V. Kravchenko; 1♂, Nahal Timna, 6.vi.1954, J. Wahrman; 1♂, Yotvata (Hay Bar) Nature Reserve, 19.xi.2014, R. Samuels; 4♂, Yotvata (Hay Bar) Nature Reserve, 18.xi.2015, A. Weinstein (all SMNHTAU).

General distribution: Israel (new record), Bahrain, Egypt (type locality, Sinai), Oman, Saudi Arabia.

Records in Israel: Central Negev, Northern Negev, Southern Negev (?), 'Arava Valley.

Biological notes: The life cycle and basic ecology of this species are unknown. It can be found in vegetation-rich habitats, related to dry salt marshes and wadis, in the 'Arava Valley and the Negev (Fig. 67B, F, H). One male nymph was collected at night (near a light trap, northern 'Arava Valley) from the ground near *Caroxylon imbricatum* (Forssk.) Moq. (Amaranthaceae). During 2022 two females were collected separately (July and November 2022, Avi More Yossef), near Telalim, Northern Negev (Fig. 39C–E). One female deposited about six oothecae. These oothecae (Fig. 68I) were dark, narrow and elongated, ~9 mm and attached to

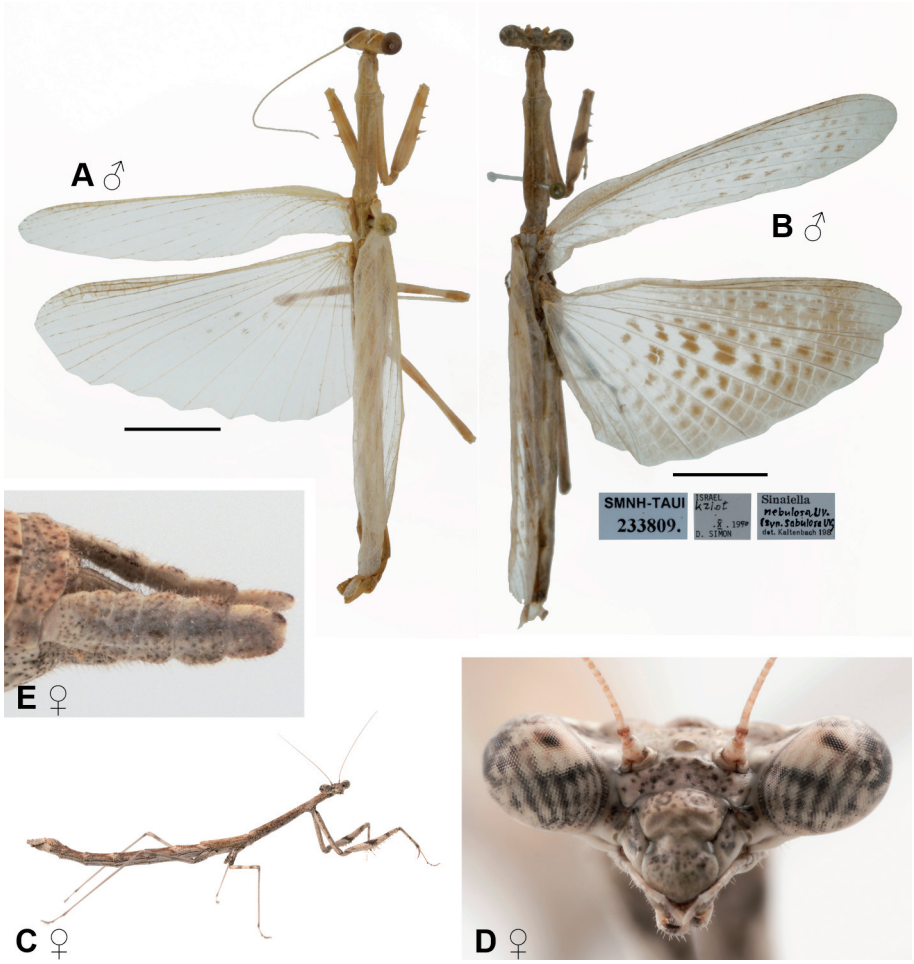


Fig. 39. *Sinaiella nebulosa*: (A) 232193, Yotvata Nature Reserve, Hay Bar, 18.xi.2015, ♂ habitus, dorsal view; (B) 233809, Qezi'ot, x.1990, ♂ habitus, dorsal view; (C–E) 441408, Telalim, xii.2022, ♀ live: (C) habitus; (D) head; (E) cercus; scale bar = 5 mm.

a twig. Both sexes are macropterous. Males were mostly collected from light traps.

Conservation: Near threatened. Elusive, very hard to find. Fragmented distribution, considered uncommon.

Notes: *Sinaiella nebulosa* was briefly described by Uvarov (1924) from a single male (coll. Boyd 1916) from Mohammedia, Northern Sinai, Egypt. Uvarov (1939*a*) briefly described *Sinaiella sabulosa*, based on three males from Saudi

Arabia. Uvarov (1939*a*: 552) remarked: "...Possibly represents only a subspecies of *S. nebulosa*, but the present material of both species is insufficient for reaching a definite decision".

Kaltenbach (1982: 37) added data for both species based on specimens from Saudi Arabia. He remarked: "*S. nebulosa*, which is usually easily distinguishable from *S. sabulosa* by the black or gray marbling of the head, pronotum, abdomen and legs, also has monochromatic yellow specimens. The most important feature for separating the two species is the terminal segment of the cerci, which is often dotted with brown or black and has an emarginate apex".

In 1991, Kaltenbach determined two male specimens from Israel as *S. nebulosa*: one from Qezi'ot (Central Negev), a darker form; and one from Hazeva ('Arava Valley), a yellowish form (representing two populations, Map 13). Both with round apex of the terminal segment of the cerci (Figs 14N, 39E).

In the determination notes (Fig. 39B) Kaltenbach wrote: "*Sinaiella nebulosa* Uv. (syn. *Sabulosa* Uv.)". Following Kaltenbach's and Uvarov's remarks, we examined the apex of the terminal segment of the cerci of all the *Sinaiella* specimens in the SMNHTAU: 11♂ from the 'Arava Valley and 2♂, 2♀ from the Central Negev, and observed a round and slightly emarginate apex in the same population.

Kolnegari *et al.* (2025: 104, 106) provide photos of the cerci and genitalia of the four species and the species key, commenting specifically regarding *S. sabulosa* and *S. nebulosa*: "... However, the morphological criteria of the two species, as well as the coloration, are variable and not beyond all doubt. Therefore, we still share Uvarov's doubts expressed in the species description of *S. sabulosa* 1939..."

Based on the above evidence, we suggest that the terminal segment of the cerci is not a sufficiently reliable characteristic to separate *S. sabulosa* from *S. nebulosa*. These two species are most likely synonymous. A further comparison is needed based on additional specimens from Egypt (Sinai) and Israel, including molecular comparison, in order to resolve the issue.

Genus *Severinia* Finot, 1902

עַנְפָּן

This is a xerothermophile genus distributed from North Africa through the Arabian Peninsula and up to Central Asia. Based on published localities from North Africa and the Arabian Peninsula, it is possible that some species show an affinity to sandy or saline habitats rich in dense vegetation in desert areas. In Central Asia, *S. turcomaniae* (Saussure, 1872) is common in dry habitats of sandy-loam soils (Shcherbakov & Savitsky 2015). The genus comprises eight known species (Otte *et al.* 2023), two to three in the Middle East. Two species are known from Israel, sympatric in the wet salt marshes of the southern Dead Sea area. Both sexes are macropterous.

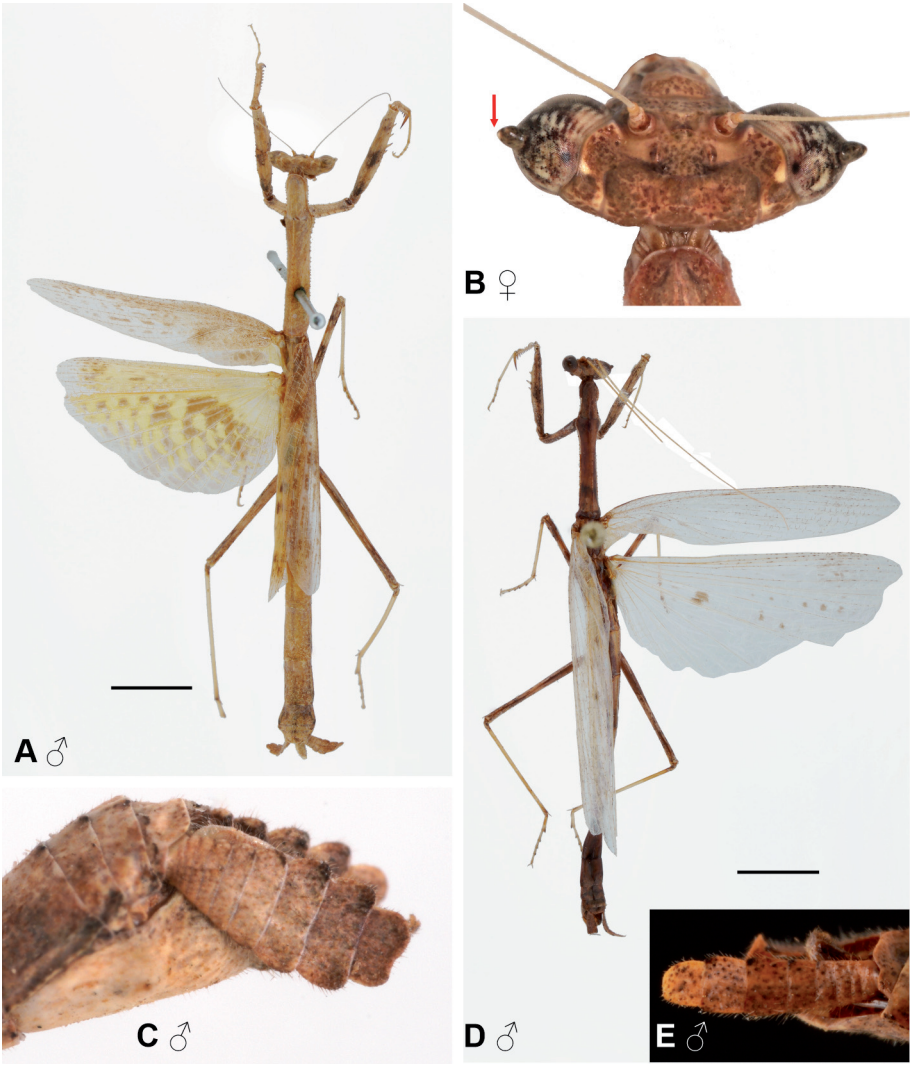


Fig. 40. (A–C) *Severinia lemoroi*: (A) 233811, Sedom, 20.xii.1959, ♂ habitus, dorsal view; (B, C) 'En Tamar, 24.vii.2017: (B) ♀ head; (C) ♂ cercus; (D, E) *Severinia popovi*: 220769, Ne'ot haKikkar, 16.vii.1999, ♂ (D) habitus, dorsal view; (E) cercus; scale bar = 5 mm.

Severinia lemoroi (Finot, 1893)

Figs 14G–I, 40A–C, 68H, Map 13

עַנְפָן מְלֻחוֹת

Body length: ♂ ~27.0 mm, ♀ 34.0–37.0 mm.

Material examined: Israel: *Dead Sea Area*: 1♂, 'En Tamar, 24.viii.2017, A. Weinstein; 1♀, 'En Tamar, 27.ix.2017, A. Weinstein; 1♀, 'En Tamar, 8.ix.2020, B. Shalmon; 1♀, 'En Tamar, 8.ix.2020, D. Simon; 1♀, 'En Tamar, 8.ix.2020, T. Simon; 1♂, 'En Tamar, 8.ix.2020, A. Weinstein; 1♂, 2♀, 'En Tamar, 10.ix.2020, A. Weinstein; 1♂, Ne'ot haKikkar, 6.vii.1965, J. Margalit; 1♂, Sedom, 30.ix.1959, Kahn (all SMNHTAU).

General distribution: Israel (new record), Algeria (type locality), Libya, Morocco, Tunisia.

Records in Israel: Dead Sea Area.

Biological notes: The species is known locally only from the salt marshes in the southern part of the Dead Sea area, a humid and unique habitat, which differs from the bordering extremely dry desert (Fig. 67H). It has been observed to be active at night on the high branches of *Suaeda monoica* Forssk. ex J.F. Gmel. (Amaranthaceae). This is a very delicate mantid that probably specializes in hunting moths, as we have observed on a light trap (in the field) and in captivity. Some of the collected females (September 2020) deposited oothecae. The oothecae (5–8 mm length) are narrow, hold 5–12 chambers and have been noted attached to a twig (Fig. 68H).

Conservation: Endangered. Although some of the salt marshes in the south of the Dead Sea are protected and are part of a declared nature reserve, the area in general is facing high pressure from agricultural development (Ben-Natan 2013).

Notes: In view of the distribution of the species in western North Africa (Battiston *et al.* 2010), the presence of *S. lemoroi* in the Levant is somewhat surprising.

Severinia popovi (Kaltenbach, 1982)

Figs 14J–K, 40D, E, Map 13

עַנְפָן דַּקִּיק.

Body length: ♂ 32.0–35.5 mm.

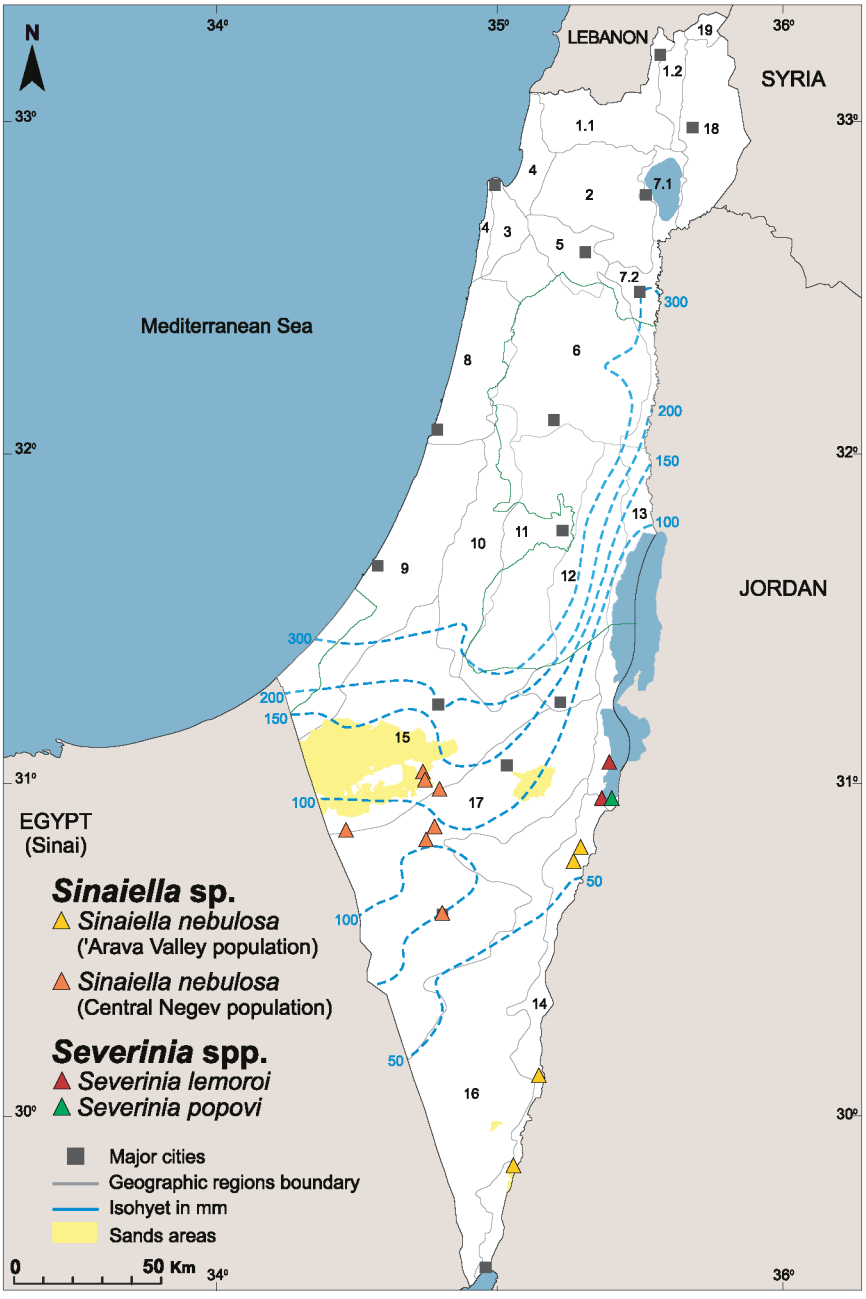
Material examined: Israel: D*ead Sea Area*: 1♂, Ne'ot haKikkar, 6.vii.1965, J. Margalit; 2♂, Ne'ot haKikkar, 16.vii.1999, I. Yarom & V. Kravchenko (all SMNHTAU**)**.

General distribution: Israel (new record), Saudi Arabia, Yemen (type locality).

Records in Israel: Dead Sea Area.

Biological notes: Biology and ecology are unknown. Probably similar to *Severinia lemoroi*.

Conservation: Endangered. Only three male specimens, collected in 1965 and 1999. Known from a single locality, the salt marshes of Melehat Sedom Nature Reserve, south of the Dead Sea. The salt marshes in this area are facing high pressure from agricultural development (Ben-Natan 2013).



Map 13. *Sinaiella nebulosa*, *Severinia lemoroi* and *Severinia popovi*, distribution in Israel.

Notes: Kaltenbach (1982) considers this species as a Sahelian-East-African element. Only two males are deposited in the SMNHTAU. This species was not collected during the present study.

Subfamily Toxoderinae Saussure, 1869
Genus *Pareuthyphlebs* Werner, 1928

עַנְפָּן

The genus *Pareuthyphlebs* comprises globally seven strongly localized species (Otte *et al.* 2023). These species have a typical Somali-Arabian distribution. Two groups of species can be distinguished: one with a robust pronotum and the other with a gracile pronotum. Two species are recorded from Israel, representing both species groups (La Greca & Lombardo 1983). The total number of the local records for both species is relatively low. These two species are generally allopatric, with the only overlap in distribution in the northern 'Arava Valley. Both sexes are macropterous. Adults are attracted to artificial light and have even been observed, in some locations, on external walls of houses near night lights. The first instar nymphs were observed on low shrubs, close to the ground.

Pareuthyphlebs occidentalis Werner, 1928
Figs 12A1–2, C, 41A–D, 68E, Map 14

עַנְפַּן הָעֲרָבָה

Body length: ♂ ~48.0 mm, ♀ 67.0–73.0 mm.

Material examined: Israel: *'Arava Valley*: 1♀, Be'er Ora, 1.xii.2014, Y. Sagi-Hochman; 1♀, Be'er Ora, 2.xii.2015, B. Shalmon; 1♀, 'Iddan, 11.x.2000, V. Kravchenko; 1♀, Qetura, 14.x.2018, B. Shalmon (all SMNHTAU**).**

General distribution: Endemic: Israel (type locality).

Records in Israel: Dead Sea Area, Southern Negev, 'Arava Valley.

Biological notes: Recorded from several sites along the 'Arava Valley, extending to the Dead Sea area and mostly from rural settlements. The preferred natural habitat of these species is unclear, as there is a stark contrast between the artificially landscapted ‘green’ settlements and the nearby natural arid habitats.

Conservation: Vulnerable. Considered locally rare. Localized and patchy geographic distribution.

Notes: The species was described by Werner (1928) from a single female. Werner specified the locality as: “Wadi Ghuweo, Palästina”. The holotype (deposited in ZMHB) was collected in 1911–1912 by L. Brühl’s expedition to the Dead Sea area. The locality name is unclear, it most probably refers to Ein el Ghuweir (Qane weSamar Nature Reserve ['Enot Qane], 31°61'N 35°39'E – closed to the public nature reserve). Endemic of Israel.

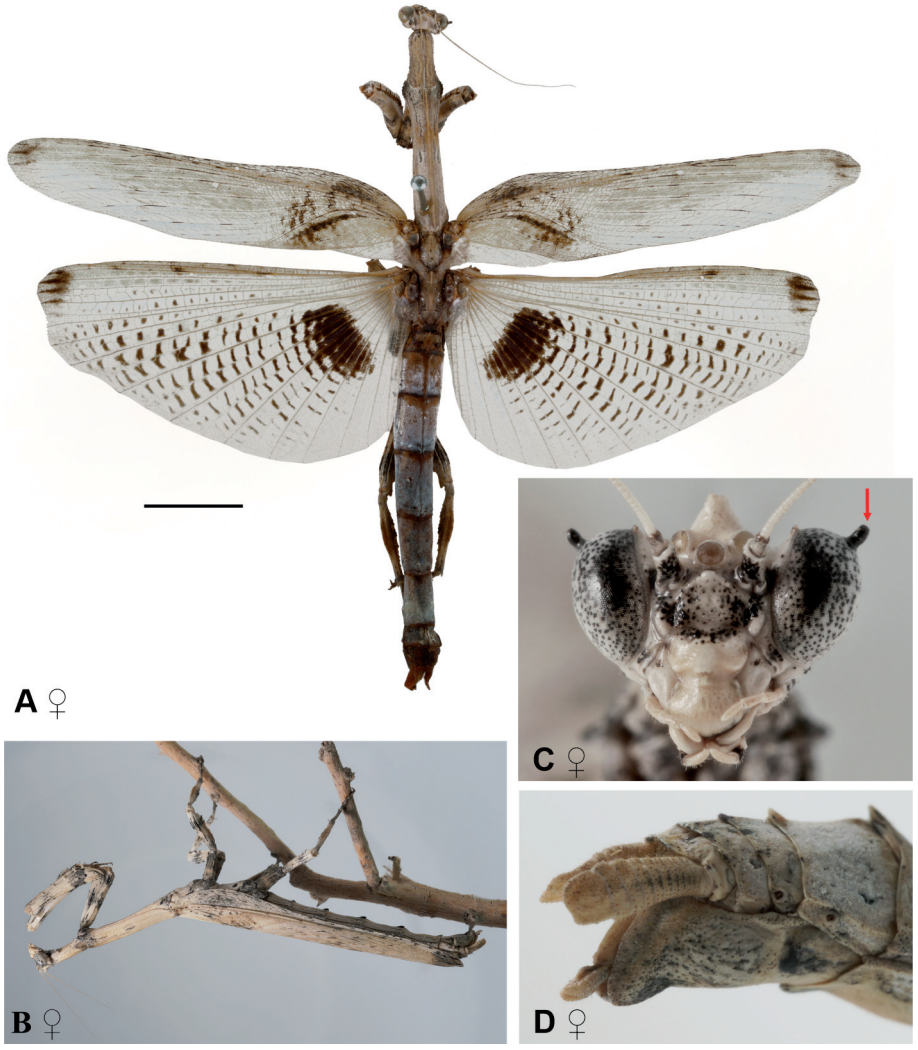


Fig. 41. *Pareuthyphlebs occidentalis*: (A) 233803, Be'er Ora, 1.xii.2014, ♀ habitus, dorsal view; (B–D) 356561, Qetura, 14.x.2018, ♀ live: (B) habitus; (C) head; (D) cercus; scale bar = 10 mm.

Pareuthyphlebs palmonii (Uvarov, 1939*b*)

Figs 12B1–2, D, 42A–D, 18F, Map 14

עַנְפַן פַּלְמוֹנִי

Body length: ♂ ~49.0 mm, ♀ 63.0–66.0 mm.

Material examined: Israel: *Golan Heights*: 1♀, Nahal Yarmukh, 19.x.1947, Y. Palmoni; 1♂, Senir, 15.v.1997, V. Chikatunov; *Upper Galilee Hills*: 1♂, Rosh Pinna, 6.x.1951, Verechsohn; *Lower Galilee*: nymph, Yuvalim,xi.2024, A. Pinsky; 1♂, Qiryat Tiv'on, 20.ix.1969, A. Markuza; *Sea of Galilee area*: 1♂, Deganya A, 9.x.1942, Y. Palmoni; 1♀, Deganya A, 17.x.1944, Y. Palmoni; 1♀, Deganya A, 25.ix.1955, Meshorer; 1♀, 'En Gev, 20.ix.1954, Meshorer; *Karmel (Carmel) Ridge*: 1♂, Haifa (Hefa), 1.x.1954, Y. Werner; *'Arava Valley*: 1♀, Nahal Gidron, 10.x.2021, D. Margalit; 1♂, Shezaf, 10.x.1999, V. Kravchenko (all SMNHTAU).

Photografic evidence:

1. A nymph, Central Negev, sandy habitat near the Shunera Sands Reserve, alt. 300 m, July 2020, on *Artemisia monosperma* Delile (Asteraceae) (photo by Nadav Bagim). https://www.facebook.com/photo/?fbid=10206835171393414

2. A nymph, Central Negev, in a rocky wadi near Yeroham Park, alt. 440 m, August 2020, on *Chiliadenus* sp. Cass. (Asteraceae) (photo by Ido Hofshteter Sebbag). https://www.facebook.com/photo/?fbid=10158773061293909

3. A female, Yuvalim, Lower Gallile, November 2024, ovipositing on rusty fence post (Kamah, Neriya and Avishay Pinsky, pers. comm. 2024). This was one of two females documented by the observers, during oviposition in nature, in the same location https://www.facebook.com/photo?fbid=10162344794364131 One ootheca has been attached to a fence wire (Fig. 68F). The ootheca is narrow, 10 mm long, 2 mm wide and 5 mm high, comprises ten to twelve egg chambers ordered in two rows.

General distribution: Israel (type locality), Jordan.

Records in Israel: Central Negev, Dead Sea Area, Golan Heights, Hula and Korazim Block, Judean Desert, Judean Foothills, Judean Hills, Karmel (Carmel) Ridge, Lower Galilee, Northern Coastal Plain, Northern Negev, Sea of Galilee area, Shomeron (Samaria), Upper Galilee Hills, Yizre'el (Jezreel), 'Arava Valley.

Biological notes: In Israel it is mostly recorded from the northern and central parts of the Mediterranean region, with only sporadic records from the Dead Sea area, Central Negev and the northern 'Arava Valley. Its preferred natural habitat is not entirely clear, but most of the records are from locations with vegetation, particularly bushes and low trees (Figs 66B**,** D, 67B).

Conservation: Least concern. Rarely observed but it appears to be widespread in its areas of occurrence.

Notes: Described by Uvarov (1939*a*) from a single female in the genus *Xenomantis* Uvarov 1939. The holotype (deposited in NHM) was collected in 1938 by Y. Palmoni near Deganya Aleph, on the eastern bank of the Jordan river, near Lake Kinneret (the Sea of Galilee).

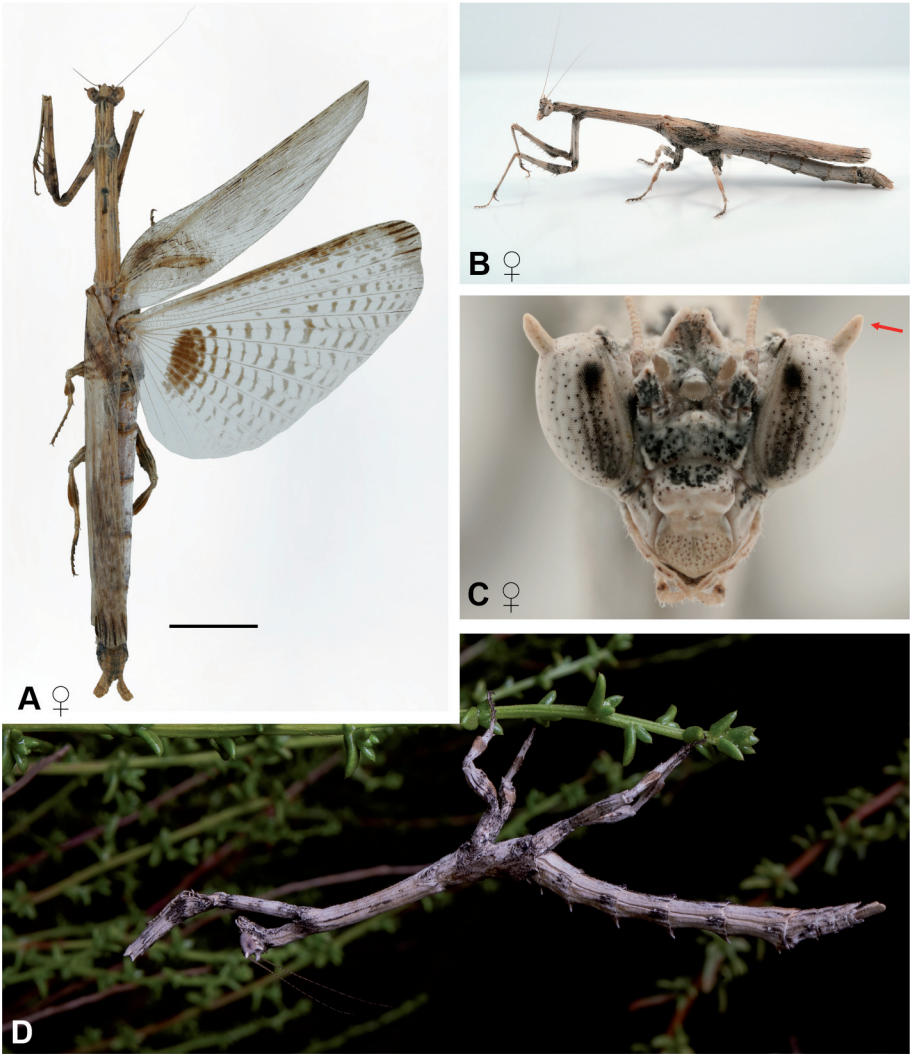
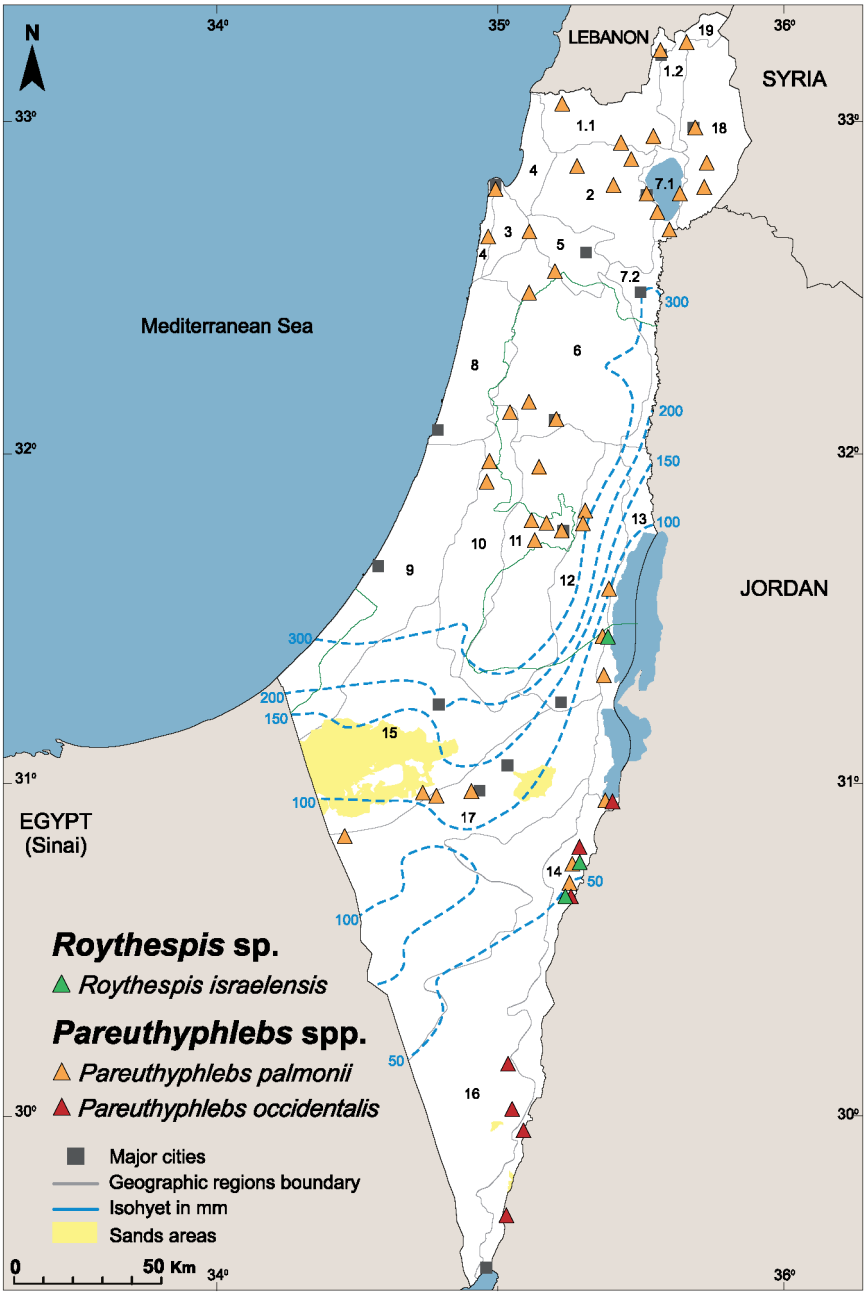


Fig. 42. *Pareuthyphlebs palmonii*: (A) 242522, no collecting data, ♀ habitus, dorsal view; (B, C) 378970, Nahal Gidron, 10.x.2021, ♀ live: (B) habitus; (C) head; (D) Western Negev, xii.2020, live nymph, habitus, photo by Nadav Bagim; scale bar = 10 mm.

Genus *Roythespis* Stiewe, 2025

עַנְפָן

This is a monotypic genus, endemic to Israel (Stiewe *et al*. 2025). *Roythespis* belongs to the tribe Calamothespini Giglio-Tos, 1914, known predominantly from Africa. The mantids of this genus are rarely collected and observed.



Map 14. *Pareuthyphlebs* spp. and and *Roythespis israelensis*, distribution in Israel.

Roythespis israelensis Stiewe, Weinstein & Simon, 2025

Figs 15C, D, 38E–G, Map 14

עַנְפָן שָׁלוּחַ

Body length: ♂ 62.5–63.9 mm, ♀ ~64.8 mm.

Material examined: Israel: *Dead Sea Area:* 1♂, 'En Gedi, 30.iv.1957, J. Kugler; 1♀, 'En Gedi, 25.vi.1957, I. Guterman; *'Arava Valley*: 1 ♂ Hazeva Field School, Shezaf Nature Reserve, 29.v.1998, D. Simon; 1♂, 'En Yahav [Ein-Weiba], 28.iv.1952 (all SMNHTAU).

General distribution: Endemic: Israel (type locality).

Records in Israel: Dead Sea Area, 'Arava Valley.

Biological notes: Known from four preserved specimens and one observation, from the southern part of the Dead Sea area and northern part of the 'Arava Valley. The single recently observed specimen, photographed by Dor Margalit (Hazeva, Rosh haShitta, 8.v.2021), was attracted to light. Probably graminicolous.

Conservation: Vulnerable. Considered locally rare. Localized and patchy geographic distribution.

Superfamily Miomantoidea Westwood, 1889
Family Miomantidae Westwood, 1889
Subfamily Miomantinae Westwood, 1889
Genus *Miomantis* Saussure, 1870

טָרַף־יָד

This is an Afrotropical genus (Marabuto *et al.* 2014), comprising 73 species (Otte *et al.* 2023), most of which are distributed south of the Sahara (Battiston *et al.* 2010). One species extends to Egypt, the Arabian Peninsula and Israel. While the Sahara Desert creates an effective barrier for the exchange of biota with the Afrotropical region, the Nile River valley offers a corridor that promotes the contact of the faunas and migration of species from deep in East Africa into the Mediterranean region (Marabuto *et al.* 2014). Only *Miomantis paykullii*, which is widely distributed throughout Africa, is known from Israel.

Miomantis paykullii Stål, 1871

Figs 14E, F, 43A–D, 69D, 70A, Map 15

טָרַף־יָד חִוֵּר

Body length: ♂ 29.0–37.0 mm, ♀ 34.0–42.0 mm.

Material examined: Israel: *Golan Heights*: 1♂, Qeshet, 18.v.1983, A. Freidberg; 2♂, Ramat haGolan, 9.ix.2005, Y. Ptashkovsky; *Upper Galilee Hills*: 1♂, 'En Zetim, 1.v.1997, O. Shnayder; *Sea of Galilee area*: 1♀, Deganya A, 3.iii.1970, Y. Palmoni; 1♂, Deganya A, 4.xi.1970, Y. Palmoni; *Karmel (Carmel) Ridge*: 1♀, Haifa (Hefa), 31.iii.1998, D. Brenner; *Central Coastal Plain*: 1♂, Bet Berl, 1.ix.1960, Student; 1♀, Bet Berl, 15.iii.1970, K. Yefenof; 1♀, Bet Berl, 21.iv.1976, K. Yefenof; 1♀, Sharon, 1.i.1979, K. Yefenof; 1♂, Giv'atayim, 5.v.1957, J. Wahrman; 1♂, Herzliyya, 18.vi.1982, A. Freidberg; 1♂, Herzliyya, 1.vi.1991, A. Freidberg; 1♂, Herzliyya, 15.v.2012, A. Mizrachi; 1♂, Nehalim,

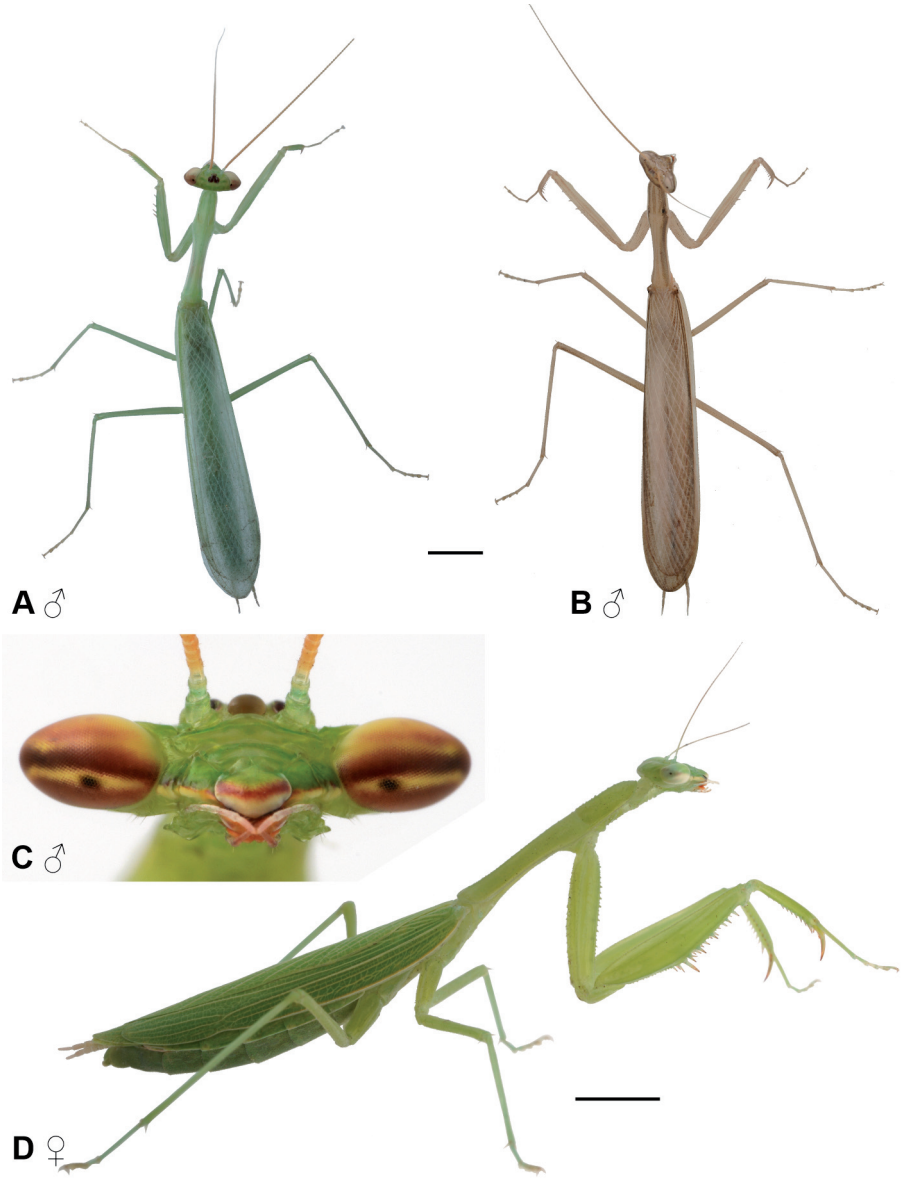


Fig. 43. *Miomantis paykullii*: (A, B) Bat Yam, viii.2020, ♂ live, habitus, dorsal view, green, and brown morphs; (C) Bat Yam, xi.2023, ♂ live, head details; (D) Bat Yam, viii.2020, ♀ live, habitus; scale bar = 5 mm.

23.vii.1964, D. Blondheim; 1♂, Petah Tiqwa, 1.x.1954, J. Wahrman; 1♂, Petah Tiqwa, 1.x.1955, J. Machlis; 1♀, Petah Tiqwa, 25.x.1990, D. Rauscher; 1♂, Petah Tiqwa, 8.vii.1991, D. Rauscher; 1♂, Petah Tiqwa, 15.vii.1991, D. Rauscher; 1♂, Petah Tiqwa, 1.x.1991, D. Rauscher; 1♂, Ra'ananna, 5.ii.1991, D. Rauscher; 1♂, Ra'ananna, 29.v.1991, D. Rauscher; 1♀, Ra'ananna, 18.viii.1991, D. Rauscher; 1♂, Ramat Gan, 5.vi.1957, N. Bernstein; 1♀, Ramat Gan, 10.xi.1964, L. Fishelsohn; 1♀, Ramat Gan, 15.iv.1998, J. Atlani; 1♀, Ramat Hen, 23.iv.1970, M. Kaplan; 1♂, Ramat Hen, 20.vii.1970, M. Kaplan; 1♂, Tel Aviv, 1.iv.1955, Arkin; 2♂, Tel Aviv, 23.vii.1955, H. Bytinski-Salz; 1♂, Tel Aviv, 8.viii.1955, H. Bytinski-Salz; 1♂, Tel Aviv, 16.iv.1956, A. Weissman; 1♂, Tel Aviv, 10.viii.1956, A. Weissman; 1♀, Tel Aviv, 11.ix.1957, J. Wahrman; 1♂, Tel Aviv, 24.v.1958, Barash; 1♀, Tel Aviv, 1.ix.1958, J. Wahrman; 1♂, Tel Aviv, 22.viii.1959, Ginzburg; 1♀, Tel Aviv, 6.x.1967, A. Freidberg; 1♂, Tel Aviv, 28.ii.1971, D. Gerling; 1♂, Tel Aviv, 2.vii.1971, Adam; 1♂, Tel Aviv, 5.vii.1977, A. Freidberg; 2♂, 1♀, Tel Aviv, 22.viii.1977, A. Freidberg; 2♂, Tel Aviv, 3.ix.1977, A. Freidberg; 2♂, Tel Aviv, 10.ix.1977, A. Freidberg; 1♂, Tel Aviv, 20.vii.1980, J. Kugler; 1♂, Tel Aviv, 1.i.1988, A. Shlagman; 1♀, Tel Aviv, 8.ix.1991, D. Rauscher; 1♂, Tel Aviv, 24.iv.2004, I. Zonstein; 1♂, Tel Aviv, A. Shlagman; 1♂, Tel Aviv, H. Bytinski-Salz; 1♂, Zur Natan, 14.xi.1972, K. Yefenof; *Shomeron (Samaria)*: 1♂, Nahal Tirza, 14.ix.1967, D. Gerling; 1♂, 1♀, Qedumim, 19.viii.2015, L. Friedman; *Southern Coastal Plain*: 1♂, Bat Yam, 16.viii.2020, A. Weinstein; 1♂, Bat Yam, 25.viii.2020, A. Weinstein; 1♂, Bat Yam, 9.xi.2023, A. Weinstein; 1♂, Holon, 12.viii.1967, N. Primor; 1♂, Miqwe Yisra'el, 8.xi.1967, S. Blondheim *et al.*; 1♂, Rishon leZiyyon, 15.v.1991, I. Herold; 1♂, Rishon leZiyyon, 25.v.1998, N. Tagar; *Judean Hills*: 1♂, Jerusalem, 1.xii.1955, B. Khamilevski; *Judean Desert*: 1♀, Ma'ale Adummim, 19.iii.1968, A. Yagar; *Dead Sea Area*: 1♂, 'En Gedi, 20.vii.2016, A. Weinstein; *Northern Negev*: 1♂, Be'er Mash'abbim, 26.xii.1956, Student; 1♂, Be'er Sheva', 18.iii.2018, B. Shalmon; 1♀, Be'er Sheva', *Southern Negev*: 1♂, Ne'ot Semadar, 15.xi.2001, V. Kravchenko (all SMNHTAU).

Central Coastal Plain: 1♂, Petah Tiqwa, 8.xii.1952; 1♂, Tel Aviv, 15.xii.1962 (all OQT).

General distribution: Israel (new record), Burkina Faso, Cameroon, Chad, Côte d'Ivoire, Cyprus, Egypt, Ghana, Kenya, Mauritania, Mauritius, Mozambique, Nigeria, Portugal, Senegal (type locality), Sudan, Togo, Uganda, Zimbabwe.

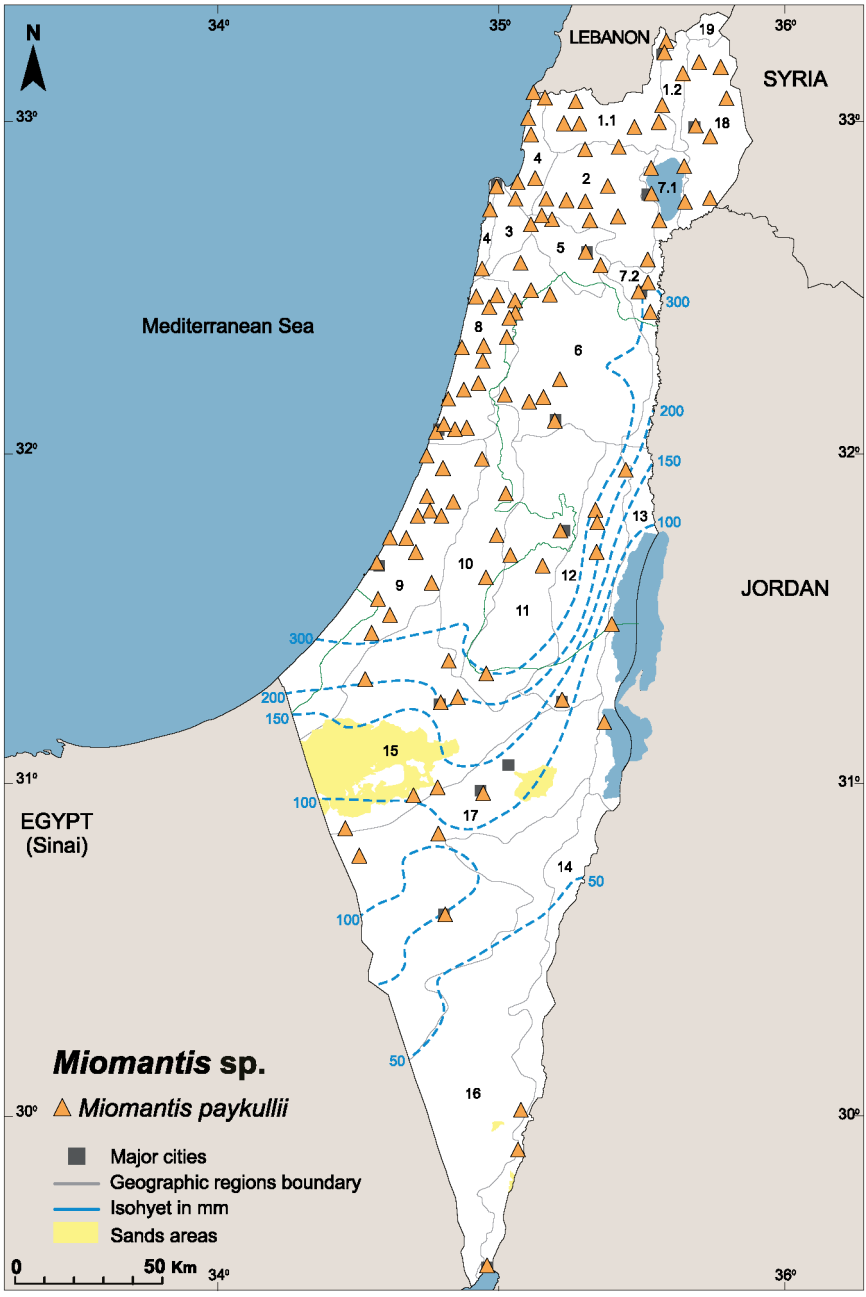
Records in Israel: Throughout the country.

Biological notes: The species demonstrates a preference for dense grass and shrubs (Fig. 66D, H). Two color morphs are recognized: the light-green morph and the light-yellow straw/grayish morph. Known from the arid areas of the Negev (in settlements), along the Mediterranean region, to the Upper Galilee Hills and Golan Heights. This species is active day and night. Both sexes are macropterous. Adults, mostly males, are attracted to the artificial light, sometimes flying into apartments.

Adults can be seen and reproduce all year round, apart to the cold peaks in the winter. The oothecae (length: 12.0–27.5 mm, n=10) (Rauscher, in litt.) (Fig. 69D) are attached to various objects: natural and man-made.

Conservation: Least concern. Currently one of the most widespread species in Israel.

Notes: Not mentioned by Buxton and Uvarov (1923) or by Bodenheimer (1925, 1935*b*, 1935*c*). Ehrmann (2002) listed this species from Israel without locality and date of collection. The earliest specimen in SMNHTAU was collected in June 1938 by Y. Palmoni in Teverya (Tiberias). Most of the specimens in the SMNHTAU were collected in 1950s – 1960s in urban areas in the coastal plain. It can be assumed that part of the current distribution is correlated to anthropogenic influences in Israel.



Map 15. *Miomantis paykullii*, distribution in Israel.

Superfamily Galinthiadoidea Giglio-Tos, 1919
Family Galinthiadidae Giglio-Tos, 1919
Genus *Galinthias* Stål, 1877

שְׁלוֹמוֹן

The genus *Galinthias* is widespread south of the Sahara and is also present in some countries of the Middle East (Roy & Stiewe 2014). According to Uvarov (1936), *Galinthias*, *Anasigerpes* and allied genera belong to the fauna of Tropical Africa, which makes a discovery of a related genus in Arabia of considerable zoogeographical interest. Currently, five species of *Galinthias* are known (Otte *et al.* 2023), of which only *Galinthias philbyi* extends its distribution outside of Africa.

Galinthias philbyi (Uvarov, 1936)

Figs 10A, B, 44A–D, 68G, Map 16

שְׁלוֹמוֹן הַשִּׁטִּים

Body length: ♂ ~18.5 mm, ♀ 18.0–21.0 mm.

Material examined: Israel: *Southern Negev*: 1♂, Nahal Zenifim, 11.x.2013, I. Renan; *'Arava Valley*: 1♀, 'En Yahav, 1.i.1989, Jonatan; 1♂, 'En Yahav, 1.ii.1981; 1♀, Hazeva, 18.x.1981, B. Shalmon; 1♂, Hazeva, 12.ix.1999, I. Yarom; 2♂, Shezaf, 10.x.1999, V. Kravchenko; 3♂, Yotvata (Hay Bar) Nature Reserve, 18.xi.2015, A. Weinstein (all SMNHTAU).

General distribution: Israel, Saudi Arabia (type locality), Yemen.

Records in Israel: Southern Negev, 'Arava Valley.

Biological notes: An arboreal mantid associated with large acacia trees (mostly *Vachellia tortilis* subsp. *raddiana* (Savi) Kyal. & Boatwr. (Fabaceae)). The acacia species (in the Rift Valley) are of the East-African origin. They dispersed into the Mediterranean region together with other species of the Sudanian elements during the Holocene (Galil 1972; Shmida & Or 1983; BenDavid-Novak & Schick 1997). *Galinthias philbyi* is active on treetops and very rarely seen in daylight; the specimens in the SMNHTAU collection were collected from light traps or from acacia tree bark. A single nymph was collected from *Vachellia tortilis* (Forssk.) (B. Shalmon, pers. obs., 1981). The ootheca (Fig. 68G) is known only from lab rearing (Rauscher, in litt.).

Conservation: Vulnerable. Considered rare. Localized geographic distribution and fragmented habitats. To date it has only been collected in the 'Arava Valley. The species' distribution is likely limited by the distribution and dispersion of the acacia trees, particularly larger ones, highlighting its sensitivity to changes in acacia population. Acacias are protected by law and any anthropogenic use of them is illegal (Armoza-Zvuloni *et al.* 2021); however, most of the high value acacia concentration areas are not protected or under any additional statutory protection (Zafon 2017). We assume that the primary spatial limiting factor of *G. philbyi* distribution is that of its specific ecological requirements.

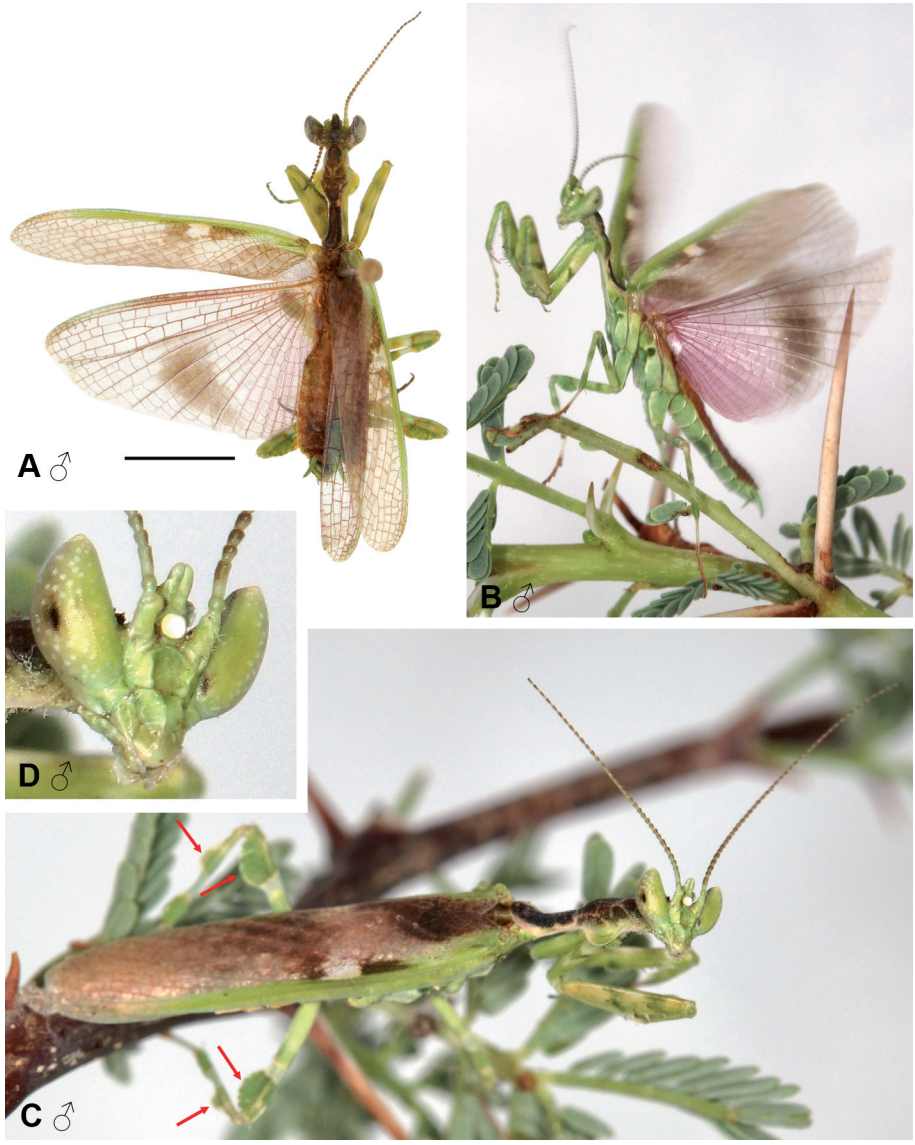
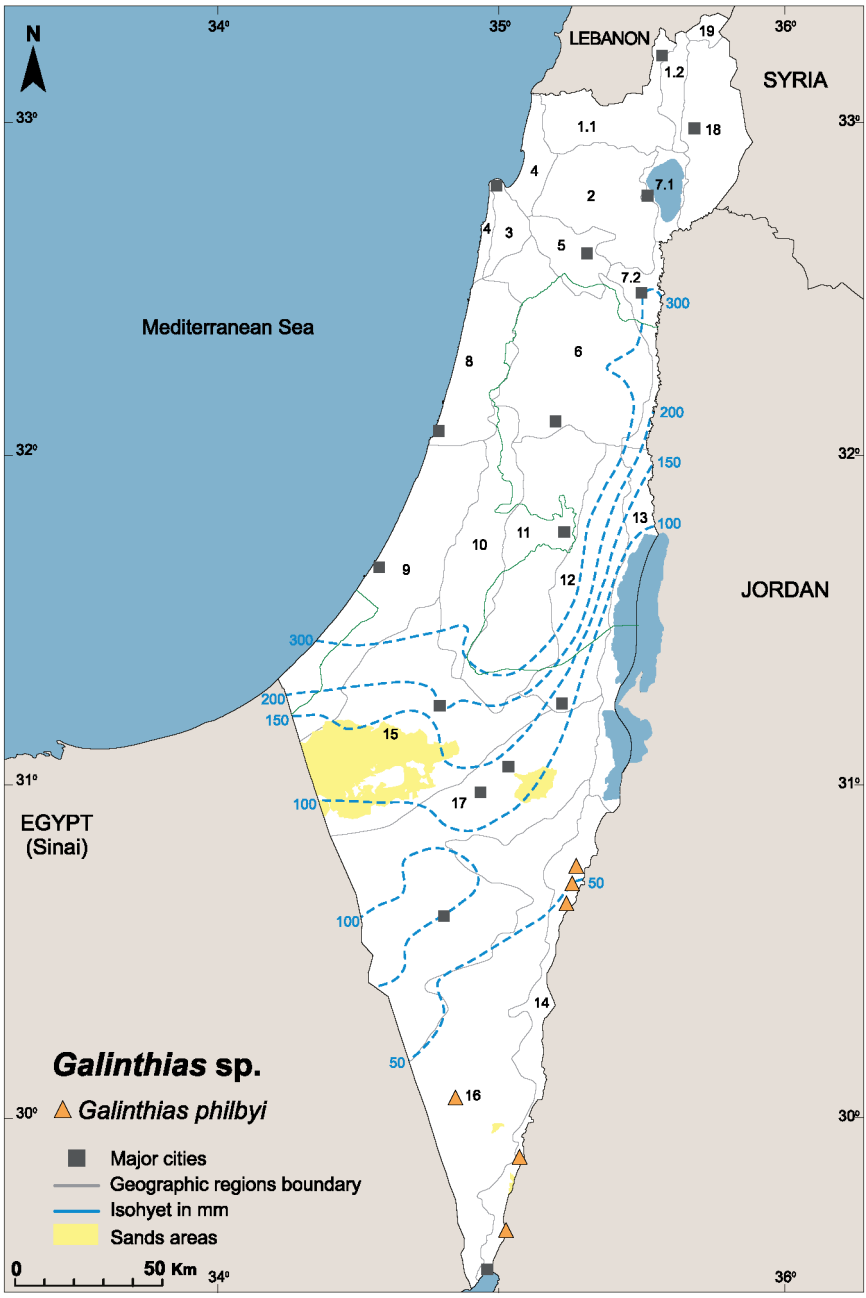


Fig. 44. *Galinthias philbyi*: 232195, Yotvata Nature Reserve, Hay Bar, 18.xi.2015: (A) ♂ habitus, dorsal view; (B) ♂ live, habitus, wings color; (C) ♂ live, habitus; (D) ♂ live, head; scale bar = 5 mm.



Map 16. *Galinthias philbyi*, distribution in Israel.

Notes: Originally described as *Attalia philbyi* by Uvarov in 1936 from a single male collected in Saudi Arabia. Later, due to homonymy, it was placed under the genus *Arabistania* Koçak and Kemal 2008, which is considered as a junior synonym of *Galinthias* (Roy & Stiewe 2014). One of the smallest and most colorful mantids in Israel.

Superfamily Hymenopoidea Giglio-Tos, 1915
Family Empusidae Burmeister, 1838

The Empusidae are widespread in Africa, Asia and southern Europe (Ehrmann 2002) and encompass three subfamilies with 10 genera and 28 species (Otte *et al.* 2023). Most species have a long prothorax and display a remarkable resemblance to plant matter (Wieland & Svenson 2018). The members of Empusidae prefer xerothermic sites and tend to engage with smaller prey. In general, empusid mantids are highly successful ambush predators and have specialized in preying on fast-flying insects such as flies and bees. They can capture their insect prey upon its landing or even during flight (Patel *et al.* 2016). The morphology, the systematics and the natural history of the family were reviewed by Svenson *et al.* (2015).

Subfamily Blepharodinae Giglio-Tos, 1919
Genus *Blepharopsis* Rehn, 1902

סוּסַת־שֵׁד

This is a monotypic genus highly noticeable for the colors and body shape which seem to be suited to mimicking colors and textures of a variety of Mediterranean herbaceous plants and desert vegetation (Battiston *et al.* 2010). Traditionally, two subspecies have been recognized: (1) the North-African *Blepharopsis mendica mendica* (Fabricius, 1775) with pronotum and legs with small hairs and the genicular lobes of the mid and hind legs not very acute, (2) the Afrotropical and Middle Eastern *Blepharopsis mendica nuda* Giglio-Tos, 1917 without hairs and with more acute genicular lobes (Battiston *et al.* 2010). Since Uvarov (1922) considered *B. nuda* as a subspecies, the status of both subspecies has been debated in the literature. Ehrmann (2011) carried out a detailed comparison of reared specimens from Israel (n=74) and the museum's specimens (SMNK) (n=113) were determined as *B. mendica*. All specimens possessed characteristics of both *B. mendica* and *B. nuda* and Ehrmann suggested that *Blepharopsis nuda* Giglio-Tos, 1917 should be synonymized with *Blepharopsis mendica* (Fabricius, 1775).

Blepharopsis mendica Fabricius, 1775

Figs 10D–F, 45A–D, 69E–F, 70B, Map 17

סוּסַת־שֵׁד מְשֻׁבָּצָת

Body length: ♂ 53.5–64.0 mm, ♀ 52.0–64.5 mm.

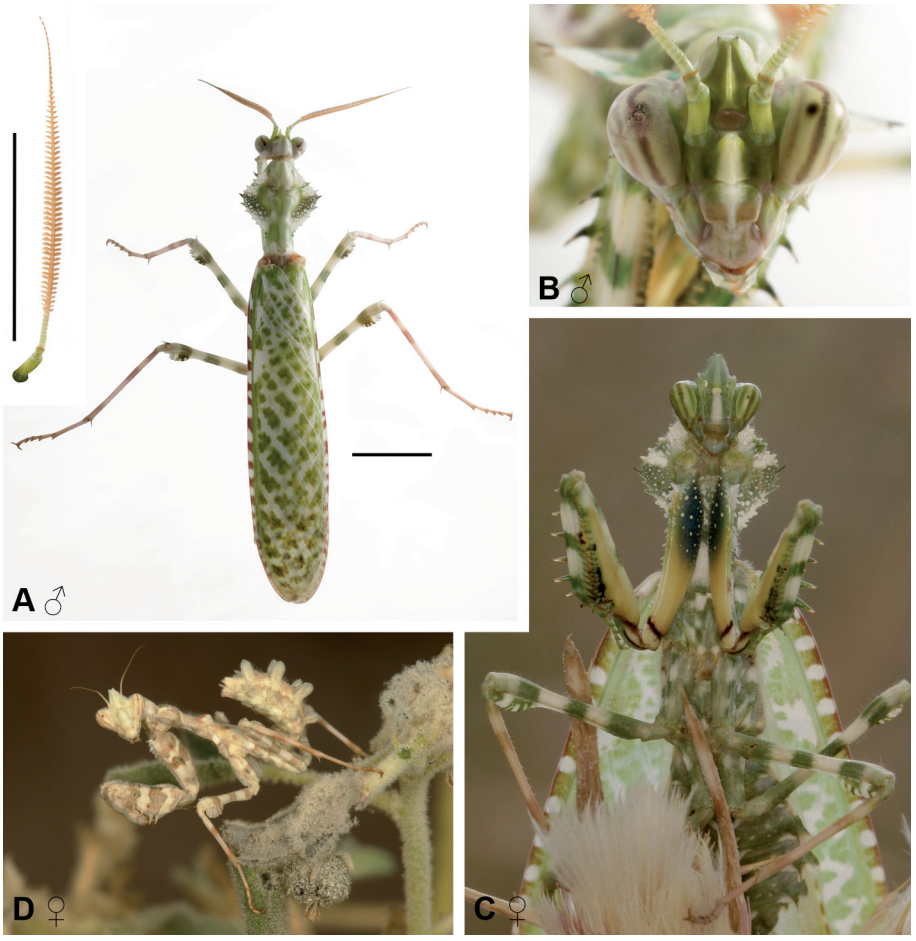
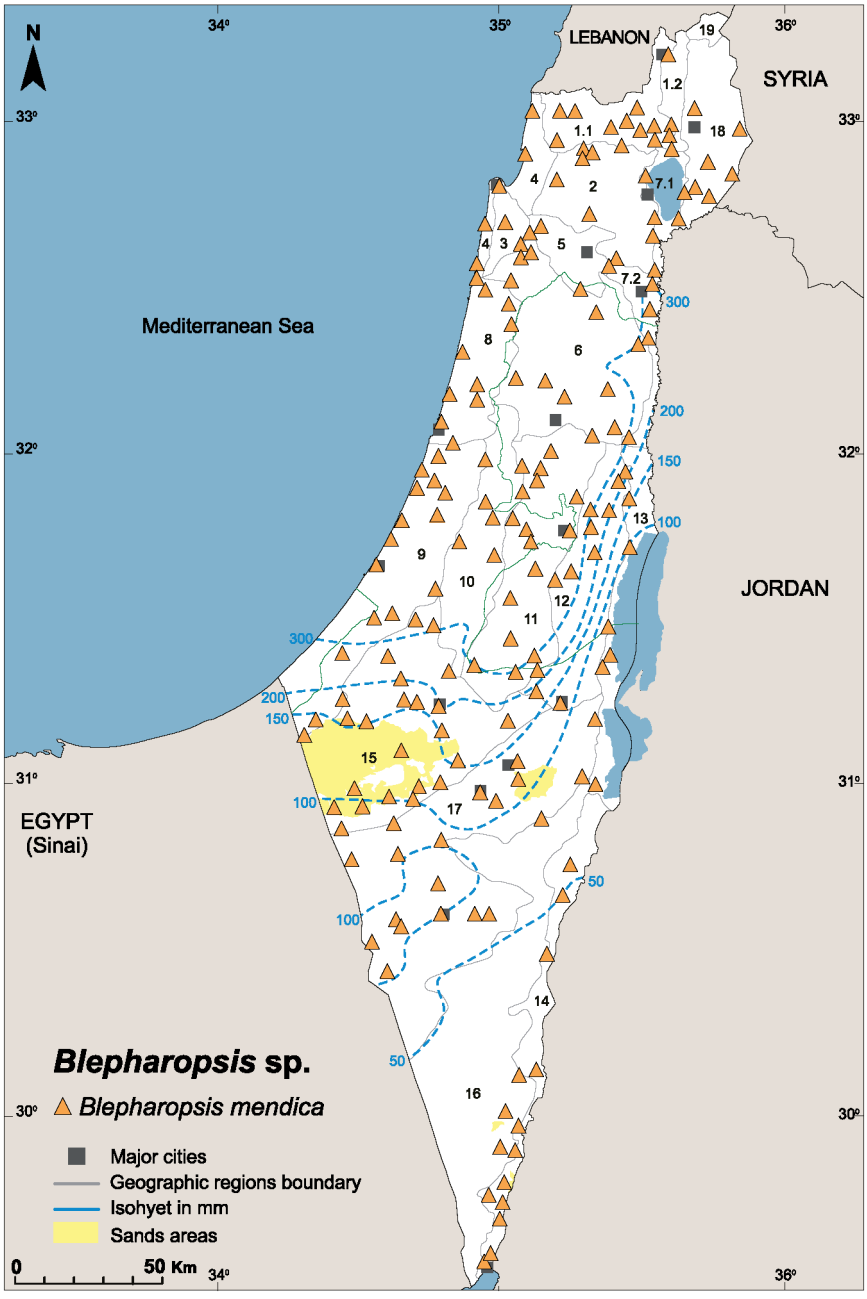


Fig. 45. *Blepharopsis mendica*: (A, B) 356546, Nahal Shitta, 7.xii.2020, ♂ live; (A) habitus, dorsal view and antenna; (B) head; (C) Zomet haNegev, 21.iv.2014, ♀ live, habitus, deimatic display; (D) Rishon leZiyyon, 20.ix.2013, live nymph, habitus; scale bar = 10 mm.

Material examined: Israel: *Golan Heights*: 1♂, 'En Ziwan, 30.xi.2026, A. Mor Yossef; *Sea of Galilee area*: 1♀, Deganya A, 25.ix.1938, Y. Palmoni; 1♂, Deganya A, 3.viii.1944, Y. Palmoni; 1♂, 'En Gev, 2.v.1938, Y. Palmoni; *Northern Coastal Plain*: 1♀, Gesher haZiw, 23.iii.1955; *Central Coastal Plain*: 1♂, Binyamina, 14.iv.1923, P.A. Buxton; 1♀, Netanya, 25.vii.1995, G. Wizen; 2♀, Ramat Gan, 22.v.1948, H. Bytinski-Salz; 1♂, Tel Aviv, 1.iv.1937; 1♀, Tel Aviv, 8.iii.1955; *Shomeron (Samaria)*: 1♂, Ma'ale Efrayim, 14.iv.1984; *Southern Coastal Plain*: 1♀, Ashdod, 10.iv.2021, A. More Yossef; 1♀, Biq'at Hureqanya, 14.iii.2016, D. Saar; 1♂, Qiryat Gat, 22.iv.1981, A. Gabay; *Judean Foothills*: 1♀, Lahav, 29.iii.1962; *Judean Hills*: 1♀, Jerusalem, 4.iv.1947, H. Bytinski-Salz; *Judean Desert*: 1♀, 'Arad, 1.viii.1972, M.P. Pener & Y. Ayal; 1♀, Ma'ale Adummim, 19.iii.1968, A. Yagar; 1♀, Nahal Ze'elim, 18.iv.1953; 1♀, Yitav Nature Reserve, 2.iv.1976, D. Simon; *Dead Sea Area*: 1♂, 'En Gedi, 6.viii.1957, J. Wahrman; 1♂, Enot Zuqim, 16.v.1943, H. Bytinski-Salz; 1♀, Sedom, 14.viii.1957, J.



Map 17. *Blepharopsis mendica*, distribution in Israel.

Wahrman; 1♀, Yeriho (Jericho), 17.iv.1969, J. Wahrman; *Northern Negev*: 1♂, Ashalim, 30.ix.2021, A. More Yossef; 1♀, Be'er Sheva', 1.v.1955, J. Halperin; 1♂, Be'er Sheva', 10.iii.1960, A. Shulov; 1♀, Be'er Sheva', 11.i.1965, Blondheim; 1♀, Bor Mashash, 27.iii.1994, D. Rauscher; 1♀, Gevulot, 4.vii.1985, E. Shney-Dor; 1♀, Har Qeren, 22.ix.2022, Y. Zvik; 1♀, Mash'abbe Sade, 6.ix.1974, M. Kaplan; *Central Negev*: 1♂, 'Avedat, 2.iv.1975, A. Freidberg; 1♀, Be'er Hagar, 24.iv.1957, L. Fishelsohn; 1♂, 'En Mor, 20.vi.1958, Y. Werner; 1♀, Har Horesha, 21.iv.1952; 1♂, Nahal Boqeq, 27.iii.1958, M. Dor; 1♀, Nahal Boqer, 7.v.1988, E. Shney-Dor; 1♂, Sede Boqer, 8.iv.1996, A. Keinan; 1♂, Zomet Zafit, 3.iv.1991, M. Altaratz; *Southern Negev*: 1♂, Nahal Shitta, 7.vii.2020, A. Weinstein; *'Arava Valley*: 1♂, Elat, 25.vii.1962, Y. Levy; 1♂, Yotvata, 22.iv.1962, J. Wahrman (all SMNHTAU).
Sea of Galilee area: 1♀, Teverya (Tiberias), 3.v.1931, A. Flumberg; *Karmel (Carmel) Ridge*: 1♂, Mt Carmel, G.E. Bodkin; 1♂, Mt Carmel, G.E. Bodkin; *Central Coastal Plain*: 1♂, Hadera, v.1923, G.E. Bodkin; *Southern Coastal Plain*: 1♂, Tel Aviv, 28.iv.1927, F.S Bodenheimer; 1♂, Rehovot, v.1935; 1♀, Zerifin, 2.xi.1921, P.A. Buxton; *Judean Foothills*: 1♀, Hartuv, 21.iv.1925, F.S. Bodenheimer; *Judean Hills*: 1♀, Bil'in, 23.v.1922, P.A. Buxton (all PPIS).
Central Coastal Plain: 1♂, Tel Aviv, 1947; *Judean Desert*: 1♀, 'Arad, 3.v.1968 (all OQT).

General distribution: Afghanistan, Algeria, Canary Island, Chad, Cyprus, Egypt (type locality), Ethiopia, India, Iran, Iraq, Israel, Jordan, Kuwait, Lebanon, Libya, Mauritania, Morocco, Niger, Oman, Pakistan, Somalia, Syria (https://inaturalist.org/observations/74717224), Sudan, Tunisia, Turkey, UAE (https://inaturalist.org/observations/245081362).

Records in Israel: Throughout all geographic areas of Israel, apart from Mt Hermon.

Biological notes: A xerothermophilic species. Present both in arid habitats and in the dry Mediterranean habitats, along the Coastal Plain and up to the Upper Galilee Hills and the Golan Heights. In the arid areas of the Judean Desert, the Negev and the 'Arava Valley, they inhabit wadis rich in flowering herbaceous plants and thistles and/or on acacia and *Tamarix* trees. In hot areas, nymphs and adults are seen all year round. The distinctive ootheca (Fig. 69E, F, length: 21.0–4.0 mm, n=2) (Rauscher, in litt.) is attached to twigs and branches of trees and shrubs. The number of eggs per ootheca varies depending on the type and size of the ootheca: 18.0 ± 2.9 eggs for unfertilized oothecae to 43.8 ± 7.2 eggs for hatched oothecae (Mirzaee *et al.* 2024). The nymphs overwinter close to the ground, on thistles and annual flowering plants. The adults are a vivid mottled green, whereas the nymphs display a large variety of mottled colors (greenish and brownish to grayish) that match the surrounding vegetation. Both sexes are macropterous, good fliers and attracted to artificial light. Detailed biology, ecology and biogeography are discussed in Mirzaee *et al.* (2024).

Conservation: Least concern. Common.

Notes: First mentioned from Palestine (Nymph, Haifa, leg. Festa) by Giglio-Tos (1893). Buxton and Uvarov (1923: 174) stated that this species was collected "in many places, but the data are not available". Bodenheimer (1925, 1935c) noted that the species is "not rear" and is widespread all over the country.

Subfamily Empusinae Burmeister, 1838
Genus *Empusa* Illiger, 1798

Figs 6C, 10G, H

סוּסַת־שֵׂד

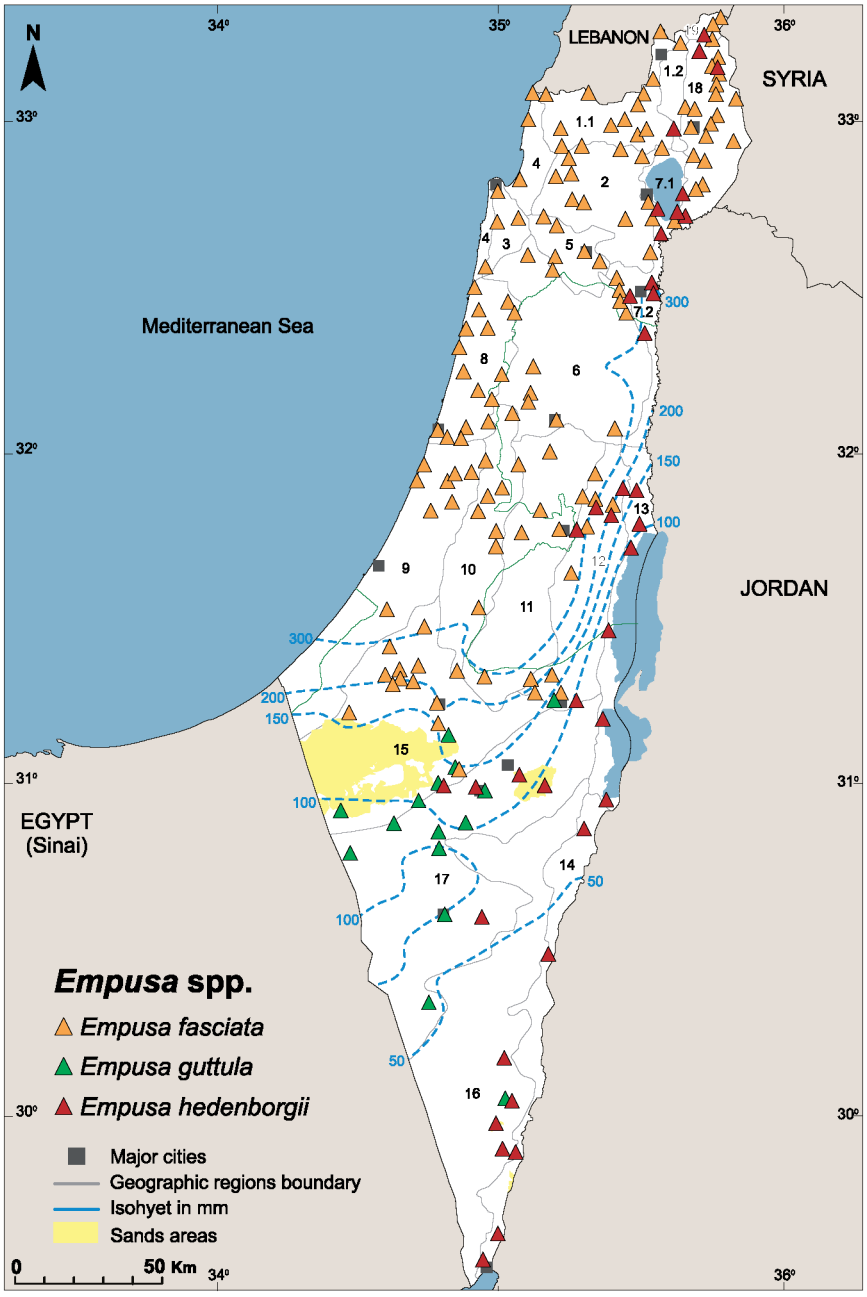
The genus is widespread in Europe, the Balkans, Africa and West and Central Asia, with 11 known species (Otte *et al.* 2023). The genus is associated with steppe-herbaceous habitats and low shrubs and is present also in arid habitats along wadis rich in vegetation. Adults and nymphs are often seen near flowers. In hot areas *Empusa* typically overwinters as nymphs, while adults appear in the spring. Active day and night. Both sexes are macropterous. Adults, mostly males, are attracted to artificial light.

Kaltenbach (1963) pointed out the difficulty in taxonomy of the genus *Empusa*, as still reflected in the validity of some species and subspecies; and the systematics of the genus requires additional work. In Israel there are three species. The overlap of distribution between the species is unclear (Map 18). The literature attributes two additional species to Israel: *Empusa longicollis* Ramme, 1951 and *Empusa uvarovi* Chopard, 1921.

Empusa longicollis – Ramme (1951) examined European and Levantine *Empusa* species. Based on a limited number of specimens and relying solely on external morphology and a limited number of characters (length of the process, length ratio of vertex to the process, length of the pronotum, shape and width of the lobes on the fore and hind coxae and size and shape of the lateral lobes of the 4th–6th tergite abdominal segments), Ramme described a new species *Empusa longicollis*.

Kaltenbach (1963) listed and pointed out the weaknesses of most of the characters, some of which are subject to considerable variation. Kaltenbach did not examine specimens from the Levant and only remarked that this matter should be verified in the future. Ramme (1951) conducted his investigations of the Levant *Empusa* specimens on a small number of specimens (3♀ and 2♂). Only one male (coll. ZMHB, type) was from Israel (Jerusalem area) and the others from Turkey. Since then *Empusa longicollis* was considered as a synonym of *Empusa fasciata* by many authors (e.g. Ehrmann 2011). Roy (2004) re-established *E. longicollis* as a distinct species and stated that one male without abdomen from Tzofit (=Zofit) (Israel: Central Coastal Plain) was deposited in the MNHN.

We have reviewed the characters of *E. longicollis* as provided by Ramme (1951), following Kaltenbach's (1963) measurement methods (as Ramme (1951) did not define measurement methods). The measured SMNHTAU specimens (23♀ and 13♂), represent a distribution gradient from the north (Golan Heights) to the south (Northern Negev). Overall, our measurements (Fig. 46) do not show significant differences within the local specimens and between these and the measurements provided by Ramme (1951) (11♀ and 3♂ *fasciata*), (3♀ and 1♂ *longicollis*) and Kaltenbach (1963) (11♀ and 3♂ *fasciata*). Considering the lack of reliable characters, the plasticity of the characters noted by Ramme (1951) and the lack of



Map 18. *Empusa* spp., distribution in Israel.

	SMNHTAU *fasciata*	Ramme (1951) *fasciata*	Kaltenbach (1963) *fasciata*	Ramme (1951) *longicollis*
♀♀	n=23	n=11	n=11	n=3
L. body	63.6-79.5	52.3-58.5	51-68	62-67.5
L. proc. vert.	6.0-8.59	6.1-7	5.8-7.7	7.4-9.8
L. pronotum	24.4-29.3	22.5-25.5	22.5-29.0	28.6-29.3
Lat. max. prontum	3.57-5.4	4.4-4.9	—	4.9-5.3
L. elytra (top)	33.27-41.26	33.2-40	34.5-41.0	38.5-40
♂♂	n=13	n=3	n=3	n=1
L. body	63.7-72.5	44.5-45.5	48-60.5	52
L. proc. vert.	3.9-5.32	4	4.0-5.5	5
L. pronotum	20.6-24.62	18.5-19.3	19.5-24.5	22.4
Lat. max. prontum	3.18-4.46	3.8-3.9	—	4.2
L. elytra (top)	31.64-42.74	36.2-36.5	37.0-43.0	40

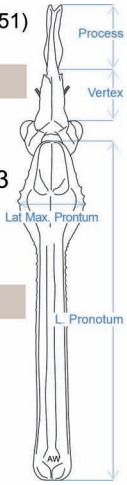


Fig. 46. Comparative table of *Empusa* spp. measurements in Ramme (1951), Kaltenbach (1963) and in SMNHTAU. Values are in mm.

ability to carry out a morphological comparison with *E. fasciata* from Europe in addition to a molecular comparison, we believe that the current evidence does not support the validity of *E. longicollis* in Israel. This issue should thus be examined in the future within a revision of the genus in the Middle East and adjacent areas.

Empusa uvarovi – is recorded from Iraq and India (Uvarov 1938; Battiston *et al.* 2010). Battiston *et al.* (2010) have considered a synonymy of *E. uvarovi* with *E. pennicornis* (Pallas, 1973). Uvarov (1930) wrote that a male of *E. uvarovi*, labeled "Jericho, 19.8.29", has been sent to the Imperial Bureau of Entomology by the Government Entomologist, Palestine. The current location of this specimen is unknown. Bodenheimer (1937) included *E. uvarovi* in the *Prodromus Faunae Palestinae*. Based on our collecting records and the SMNHTAU records, the only known *Empusa* along the Rift Valley, from the city of Elat area (south) to Mt Hermon (north) is *E. hedenborgi*.

Empusa fasciata Brullé, 1832

Figs 11A–D, 47A–E, 69G, 70C, Map 18

סוּסַת־שֵׁד מַקֶּלִית

Body length: ♂ 63.7–72.5 mm, ♀ 63.5–79.5 mm.

Material examined: Israel: *Golan Heights*: 1♀, Allone haBashan, 25.v.2022, O. Levi; 1♀, Har Avital, 21.v.1969; 1♂, Har Avital, 29.v.1969; 3♂, Merom Golan, 15.ii.1987, G. Gissis; 1♀, Qazrin, 12.v.1998, E. Filler; 1♂, Qeshet, 15.v.1983, A. Freidberg; 13♂, Qeshet, 18.v.1983, A. Freidberg; 1♂, Qeshet, 11.v.1984, E. Shney-Dor; 1♂, Senir, 6.iv.1993, R. Kasher; *Hula and Korazim Block*: 1♀, Nahal Dan,

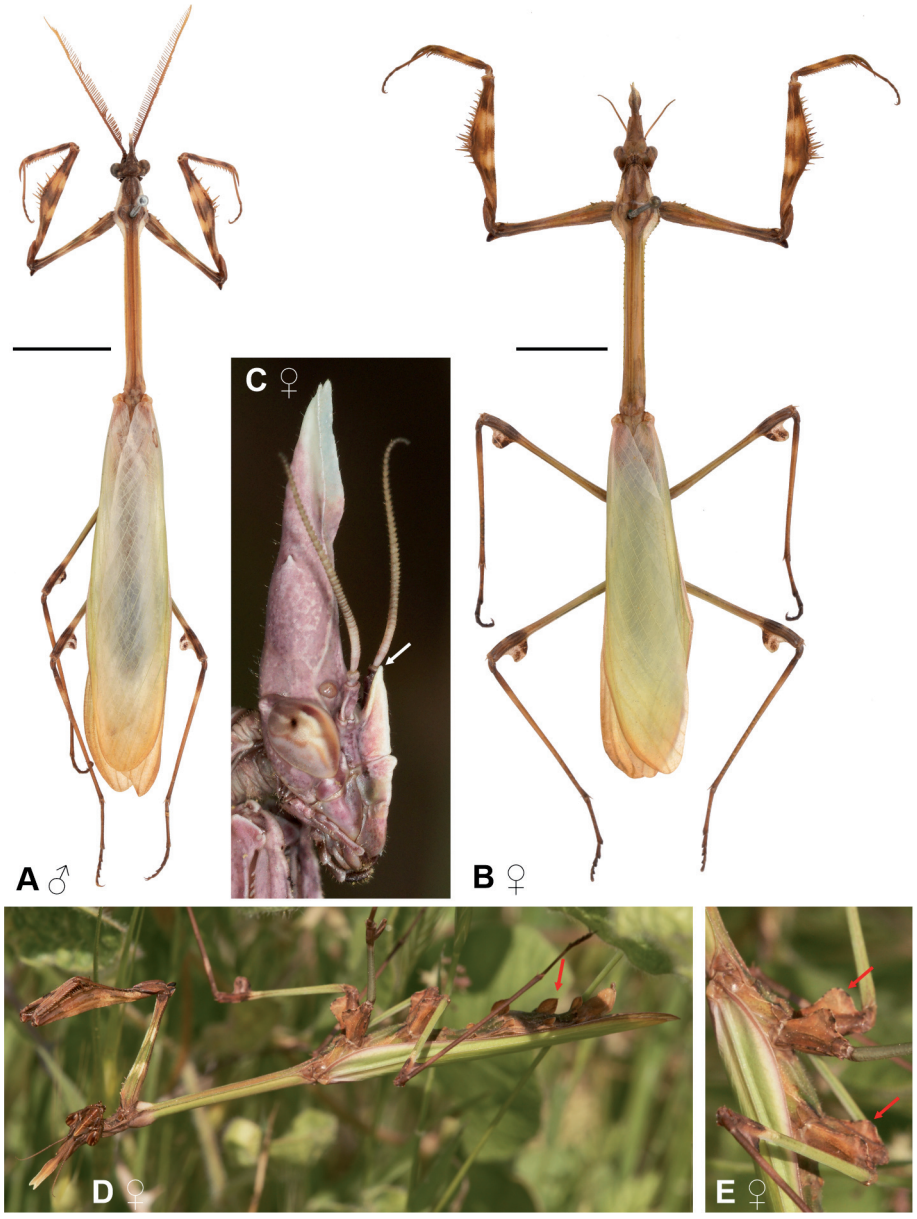


Fig. 47. *Empusa fasciata*: (A) 264977, Even Sappir, 18.x.1957, ♂ habitus, dorsal view; (B) Jerusalem, 14.x.1965, ♀ habitus, dorsal view; (C) Ben Shemen Forest, 5.ix.2016, ♀ head; (D–E) Shoham Park, 20.iii.2010, ♀ live; (D) habitus; (E) abdominal sternite lobes and mid and hind coxae lobes; scale bar = 10 mm.

20.v.1997, S. Ben-Aroya; *Upper Galilee Hills*: 1♀, Tel Hay, 17.v.1976, A. Freidberg; *Lower Galilee*: 1♂, Maghar, 14.v.1974, F. Nachbar; *Sea of Galilee area*: 1♂, Deganya A, 28.iv.1939, Y. Palmoni; 1♂, Kare Deshe, 19.iv.1976, A. Freidberg; 1♀, Tel Qazir, 14.v.1955, J. Wahrman; *Northern Coastal Plain*: 1♂, Qiryat Hayyim, 9.iv.2005, Y. Ptashkovsky; *Karmel (Carmel) Ridge*: 1♂, Haifa (Hefa), 12.vii.1944, H. Bytinski-Salz; 1♂, Ramat HaNadiv, 6.iv.2022, Ben Maior; 1♂, Zikhron Ya'aqov, 19.iii.1951; 1♀, Zikhron Ya'aqov, 20.iii.1952; 1♂, Zikhron Ya'aqov, 30.iii.1952; 1♀, Zikhron Ya'aqov, 22.v.1957, Ch. Lewinsohn; 1♀, Zikhron Ya'aqov, 3.v.1964, Ch. Lewinsohn; *Yizre'el (Jezreel) Valley*: 1♂, Nahalal, 3.v.1932, Y. Palmoni; 1♂, Nahalal, 6.iv.1951, M. Sternlicht; *Central Coastal Plain*: 1♀, Hadera, 30.iv.1951, M. Sternlicht; 1♀, Petah Tiqwa, 1.x.1954, J. Machlis; 1♀, Petah Tiqwa, 2.v.2023, A. Weinstein; 1♀, Rehovot, 22.iii.1955, J. Halperin; 1♂, Tel Aviv, 13.iv.1970, M. Kaplan; *Judean Foothills*: 1♂, Amazya, 23.iv.1981, I. Yarom; 1♀, Bet Guvrin, 8.vi.1962, P. Amitai; 2♂, Hartuv, 21.iv.1925, F.S. Bodenheimer; 1♀, Hartuv, 16.v.1969, J. Wahrman; 1♀, Lahav, 30.viii.1961, M.P. Pener *et al.*; 1♀, Lahav, 1.iv.1989, A. Shlagman; 1♂, Zanoah, 14.iv.1955, Nachmani; *Judean Hills*: 1♂, Even Sappir, 18.v.1957, N. Ginsburg; 1♂, Giv'at Ye'arim, 15.v.2022, A. More Yossef; 1♂, Horbat Se'adim, 16.ii.1990, D. Rauscher; 1♀, Jerusalem, 27.vii.1942, H. Bytinski-Salz; 1♂, Jerusalem, 23.iv.1955, Nachmoni; 1♀, Jerusalem, 14.v.1955, J. Wahrman; 1♀, Jerusalem, 10.v.1957, J. Wahrman; 1♂, Jerusalem, 20.iv.1958, C. Shina; 1♀, Jerusalem, 27.iv.1962, A. Beiles; 1♂, Jerusalem, 26.iv.1963, Faunistics; 1♀, Jerusalem, 7.v.1965, Faunistics; 1♀, 1♀, Jerusalem, 14.v.1965, Faunistics; 1♀, Jerusalem, 29.v.1965, M.P. Pener & S. Blondheim; 1♀, Jerusalem, 31.iii.1969; 1♂, Jerusalem, J. Halperin; 1♀, Ma'on, 14.iv.2015, L. Friedman; 1♀, Qiryat 'Anavim, Sh. Amitai & E. Swirski; 1♀, Ramat Razi'el, 21.iv.1975, D. Simon; *Northern Negev*: 1♀, Devira, 19.iv.2015, L. Friedman; 1♂, 1♀, Eshel haNasi, 9.viii.1963, M.P. Pener & S. Blondheim; 1♂, Gevulot, 1.vii.1986, E. Shney-Dor; 1♀, Gevulot, 30.viii.1986, E. Shney-Dor; 1♂, Zomet Lehavim, 27.iii.1991, D. Rauscher (all SMNHTAU).

Karmel (Carmel) Ridge: 1♀, Qeren Karmel, 9.iv.1930; 1♀, Qeren Karmel, 21.vii.1930; 1♀, Qeren Karmel, 1.viii.1930; 1♂, Qeren Karmel, 1930; *Southern Coastal Plain*: 1♀, Tel Aviv, 7.vi.1950, Bytinski-Salz; *Judean Hills*: 1♀, Ben Shemen, 24.iii.1927, F.S. Bodenheimer; 1, Jerusalem, 8.iv.1931, A. Flumberg (all PPIS).

Northern Coastal Plain: 1♀, Dor, 2.iv.1946, D. Sheikh; *Karmel (Carmel) Ridge*: 1♀, Mt Carmel, 15.vi.1960, Ch. Sandler; *Yizre'el (Jezreel) Valley*: 1♂, Oranim, 5.v.1967, Ch. Sandler (all OQT).

General distribution: Algeria, Croatia, Cyprus, Egypt, Greece (type locality), India, Iran, Israel, Jordan, Lebanon (https://inaturalist.org/observations/140066793), Oman, Syria (https://inaturalist.org/observations/159445389), Romania, Turkey.

Records in Israel: Central Coastal Plain, Golan Heights, Hula and Korazim Block, Judean Desert, Judean Foothills, Judean Hills, Karmel (Carmel) Ridge, Lower Galilee, Mount Hermon, Northern Coastal Plain, Northern Negev, Sea of Galilee area, Shomeron (Samaria), Southern Coastal Plain, Upper Galilee Hills, Yizre'el (Jezreel) Valley.

Biological notes: A characteristic Mediterranean species, inhabiting dry and warm areas with low vegetation (Fig. 66A, B, D): grass, herbaceous plants and shrubs (Gomboc 2000). The daily activity peak is during the hot hours of the day (Bodenheimer 1935*c*). The ootheca (Fig. 69G) (length: 9.0–10 mm, n=2) (Rauscher, in litt.) is deposited on stems of high annuals and shrubs. According to Abu-Dannoun (2006): "One female produced three oothecae; the first one was the largest and produced 16 eggs". They survive the winter months as young nymphs and both the young and adults of these long-lived insects can be seen together during the late summer months (Gomboc 2000).

Conservation: Least concern. A common species in the Mediterranean habitats of Israel; from the northern Negev to the north of the Golan Heights and Mt Hermon (up to 1,600 m).

Empusa hedenborgii Stål, 1877

Figs 11H–K, 48A–E, Map 18

סוּסַת־שֵׂד מִזְרָחִית

Body length: ♂ 55.0–71.0 mm, ♀ 60.0–79.0 mm.

Material examined: Israel: *Mount Hermon*: 1♂, Mt Hermon; *Sea of Galilee area*: 1♂, Deganya A, 11.vii.1934, Y. Palmoni; 1♀, Deganya A, 2.x.1935, Y. Palmoni; 1♀, Deganya A, 8.vi.1939, Y. Palmoni; 1♂, Deganya A, 27.viii.1943, Y. Palmoni; 1♂, Deganya A, 8.viii.1963, Y. Palmoni; 1♀, 'En Gev, 20.ix.1954; 1♀, Ha'On, 6.viii.1956, J. Wahrman; 1♂, Tel Qazir, 20.ix.1955; 1♂, Tel Qazir, 28.vii.1956; 1♂, Tel Qazir, 6.viii.1956, J. Wahrman; 1♂, Tel Qazir, 8.viii.1956, J. Wahrman; 1♀, Tel Qazir, *Judean Hills*: 1♂, Jerusalem, 27.vii.1942, H. Bytinski-Salz; *Judean Desert*: 1♂, 'Arad, 18.ix.1962, S. Blondheim; *Dead Sea Area*: 1♀, 'En Gedi, 20.vii.2016, A. Weinstein; 1♀, 'En Gedi, 24.viii.2017, A. Weinstein; 1♀, 'En Gedi Nature Reserve, 1.viii.1951; 1♂, 'En Gedi Nature Reserve, 10.viii.1957, J. Wahrman; 6♂, 1♀, 'En Gedi Nature Reserve, 16.viii.1957, J. Wahrman; 1♂, 'En Gedi Nature Reserve, 18.vi.1958, J. Wahrman; 1♀, 'En Gedi Nature Reserve, 27.vi.1959, J. Krystal; 1♀, Hof Mineral, 10.vii.2015, A. Weinstein; 1♀, Nahal Qumeran, 1.iv.2016, L. Friedman; 1♂, Ne'ot haKikkar, 19.iv.1999, I. Yarom & V. Kravchenko; 1♂, Ne'ot haKikkar, 16.vii.1999, I. Yarom & V. Kravchenko; 2♂, Tel Goren, 1.viii.1972, M.P. Pener & Y. Ayal; 1♂, Yeriho (Jericho), 22.viii.1943, H. Bytinski-Salz; *Northern Negev*: 1♂, Mash'abbe Sade, 24.viii.1965, J. Wahrman; 1♂, Mishor Yamin, 2.i.1967, M. Broza; *Central Negev*: 1♀, Tel Yeroham, 1.iv.1989, A. Shlagman; 2♂, Nahal Shitta, 27.vii.2017, A. Weinstein; *Southern Negev*: 1♀, Ne'ot Semadar, 20.vii.2018, A. Weinstein; 2♂, Ne'ot Semadar, 20.vii.2018, A. Weinstein; *'Arava Valley*: 1♂, 'En Hazeva, 12.iv.1955, J. Wahrman; 1♂, Hazeva, 18.v.1991, A. Ionescu; 1♀, Hazeva, 25.v.2021, A. Weinstein; 1♂, Hazeva, 29.v.2022, T. Simon; 1♂, Samar, 18.viii.2016, A. Weinstein; 1♂, Yotvata, 16.vii.1999, I. Yarom & V. Kravchenko; 1♂, Yotvata, 16.viii.1999, I. Yarom & V. Kravchenko; 1♂, Yotvata, 2.x.2019, N. Segev; 1♂, Yotvata, 18.iii.2021, N. Segev (all SMNHTAU).

'Arava Valley: 1♀, Yotvata, 23.iii.1972, Ch. Sandler (all OQT).

General distribution: Egypt, Ethiopia, Iran, Israel, Saudi Arabia, Somalia, Sudan (type locality), United Arab Emirates, Yemen.

Records in Israel: Central Negev, Dead Sea Area, Golan Heights, Jordan Valley, Judean Desert, Judean Hills, Mount Hermon, Northern Negev, Sea of Galilee area, Southern Negev, 'Arava Valley.

Biological notes: It is found in low vegetation: grass, herbaceous plants and shrubs. A xerothermophilic species that is widespread in Israel along the Rift Valley from the southern 'Arava (alt. 30 m) through the Dead Sea basin (alt. -400 m) and peripheral wadis, along the Jordan Valley and up to the lower slopes of Mt Hermon area. Apart from the northern section of this strip, the typical climate of this area is hot and dry most of the year. In the 'Arava, it can be found in wadis or sandy habitats. Kaltenbach (1982) considered this species as a Sahelian-East-African element.

Conservation: Near threatened. Rarely seen, but common in the natural habitats of its areas of occurrence. Distributed along a narrow strip on the Rift Valley, which is highly populated and subjected to increasing fragmentation and loss of habitats due to anthropogenic developments and activities.

Notes: The species was described from Nubia (Sudan) in 1871. The first mention of *E. hedenborgii* from Israel (Wadi Kelt/Nahal Prat) appears in Buxton and Uvarov (1923), based on the collections of Buxton and Theodor (during 1921–

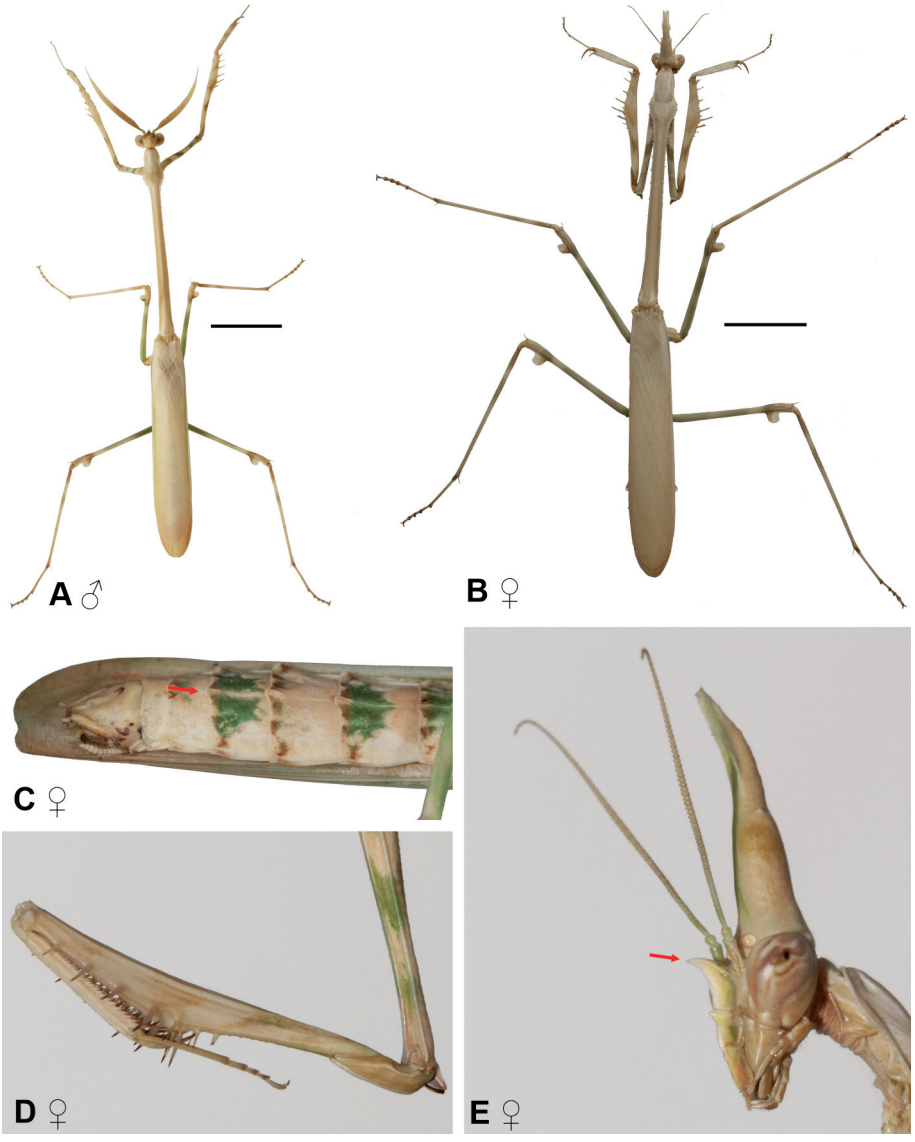


Fig. 48. *Empusa hedenborgii*: (A, B) Ne'ot Semadar, 20.vii.2018; (A) 326777, ♂ habitus, dorsal view; (B) 286975, ♀ habitus, dorsal view; (C) 283899, Samar, 18.viii.2016, ♂ live, abdominal sternite lobes; (D–E) 232201, Hof Mineral, 10.vii.2015, ♀ live; (D) fore leg; (E) head; scale bar = 10 mm.

1923) and confirmed by Uvarov at the British Museum. Bodenheimer (1925) listed two localities in the Mediterranean region: Ben Shemen and Hartuv (10–20 May (no year mentioned)). Cross-referencing this information with the SMNHTAU revealed two specimens of *E. fasciata* from Hartuv, collected by Bodenheimer on 21.v.1925. No *E. hedenborgii* from the Judean foothills or Mediterranean region are present in the SMNHTAU.

Empusa guttula (Thunberg, 1815)

Figs 11E–G, 49A–E, Map 18

סוּסַת־שֶׂד מִדְבָּרִית

Body length: ♂ 66.0–71.0 mm, ♀ 82.0–85.0 mm.

Material examined: Israel: *Judean Desert*: 1♂, 'Arad, 23.ii.2021, A. More Yossef; 1♀, 'Arad, 15.iv.2021, A. More Yossef; *Northern Negev*: 1♂, Ashalim, 15.v.2021, A. More Yossef; 1♂, Ashalim, 2.vi.2021, A. More Yossef; 1♀, Be'er Milka, 17.vii.2023, N. Michaeli; 1♂, Mash'abbe Sade, 1.vii.2020, A. More Yossef; 1♂, Mash'abbe Sade, 6.vi.2021, A. More Yossef; 1♀, Mash'abbe Sade, 15.viii.2021, A. More Yossef; 1♀, Zomet haNegev, 18.v.2020, A. More Yossef; 1♀, Zomet haNegev, 15.vii.2021, A. More Yossef; *Central Negev*: 1♀, Be'er Hagar, 7.vii.1946, H. Bytinski-Salz; 1♂, Be'er Karkom, 18.v.1979, D. Furth; 1♀, Midreshet Ben Gurion, 26.v.2020, A. Buskila; 1♂, Nahal haRo'a, 24.v.2021, A. Weinstein; 1♀, Nahal Ramon, 26.iv.1952; 1♂, Yeroham, 6.vii.2021, Y. Zvik (all SMNHTAU).
Central Negev: 1♀, Ramat 'Avedat, 30.iv.1968 (all OQT).

General distribution: Israel (new record), Algeria, Angola, Burkina Faso, Cameroon, Chad, Egypt, Ethiopia, India, Kenya, Libya, Madagascar, Morocco, Namibia, Socotra, Somalia, South Africa, Tanzania, Tunisia.

Records in Israel: Central Negev, Judean Desert, Northern Negev.

Biological notes: In vegetation-rich wadis, desert shrub-steppes (Fig. 67B): on low shrubs and annuals and on shrubs in sandy habitats. *E. guttula* is widespread throughout most of Africa (Kaltenbach 1996). It was recorded from Egypt from Solloum (El Salloum, Egypt) (Uvarov 1924) and the southern Sinai Peninsula (Wadi Isla, alt. ~500–1100 m) (Mohammad *et al.* 2011); the last record appears doubtful. Records in Israel are mostly from the Negev Highlands (alt. 300–800 m). Its distribution pattern indicates the Saharo-Arabian – Irano-Turanian transitional area of the Negev.

Conservation: Near threatened. Rarely seen, but common within its range. Some of the natural habitats are facing increasing pressure from anthropogenic developments and activities such as the construction of vast solar energy fields, agriculture and industrial developments.

Notes: Villani (pers. comm. 2022) considers *E. guttula* as a part of the *Empusa guttula* complex: "No description of *E. guttula* is satisfying, because all the descriptions (Giglio-Tos, 1927; Battiston *et al.* 2010) are vague or based on mixed series. The true *E. guttula* seems to live only in the Sahara, Sahel and East African areas. It is replaced by *Empusa binotata* Serville, 1839 (synonym *Empusa fronticornis* Stoll, 1813) in Southern Africa and by *Empusa pennata* (synonym

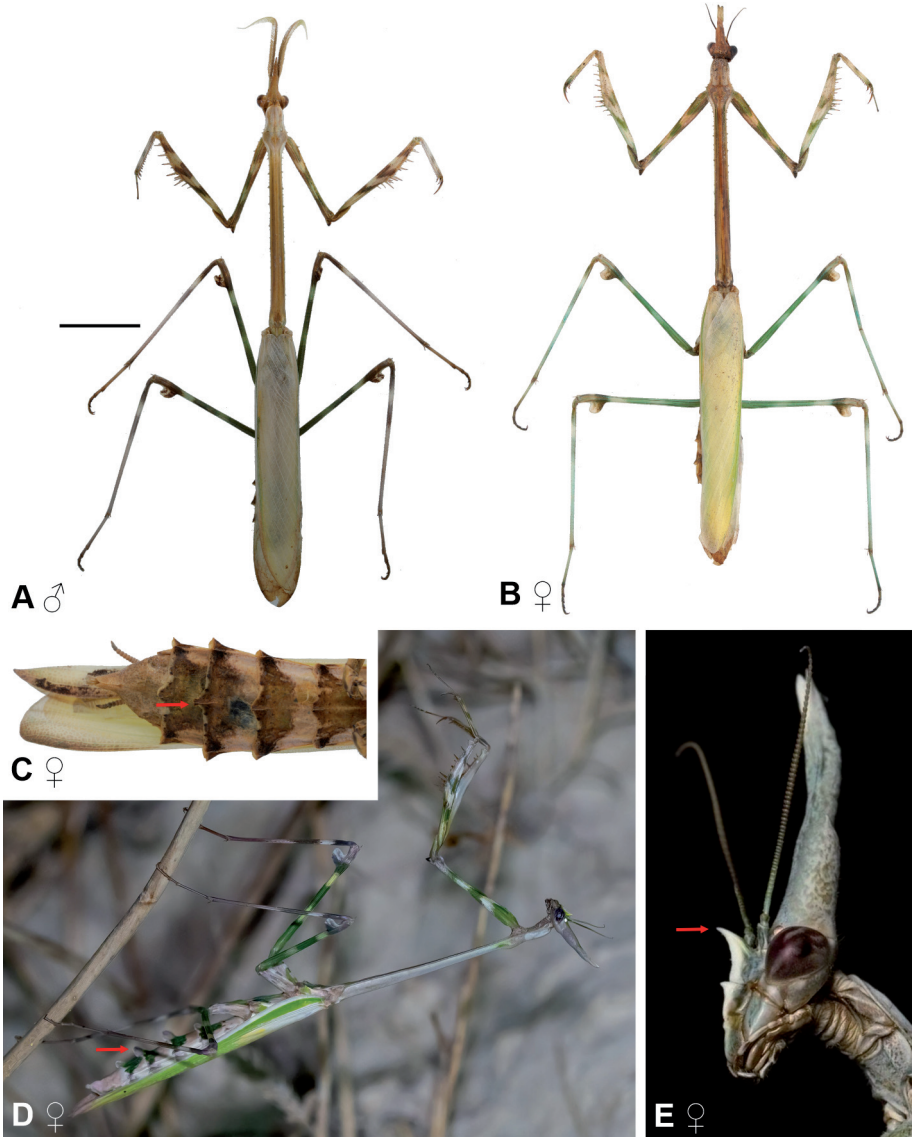


Fig. 49. *Empusa guttula*: (A) 356549, Zomet haNegev, 18.x.2020, ♂ habitus, dorsal view; (B) 441410, Be'er Milka, 17.xii.2023, ♀ habitus, dorsal view; (C) Zomet haNegev, 18.xi.2020, ♀, abdominal sternite lobes; (D) ♀ live, habitus, photo by Assaf Tsabar; (E) ♀ head, photo by Ido Hofshteter-Sebbag; scale bar = 10 mm.

Empusa pauperata Fabricius, 1781) in East Iran and the Indian subcontinent. In the Arabian Peninsula, there is an easily recognizable species, *Empusa spinosa* Krauss, 1902, that also belongs to the *guttula* group. All records of *guttula* from South Africa and India likely represent misidentifications and must be attributed to the above species". The taxonomic status of the local *E. guttula* needs to be clarified within a broader framework of the genus and group revision.

Genus *Hypsicorypha* Krauss, 1892

סוּסַת־שֵׂד

The is a monotypic genus (Otte *et al.* 2023). It's type species was described as *Empusa* (*ldolomorpha*) *gracilis* by Burmeister in 1838 from an unknown locality. Widely distributed in North Africa and the Arabian Peninsula. A xerothermophilic mantid, associated with dry and arid habitats. Kaltenbach (1982) considered the *Hypsicorypha* as a Mediterranean-Ethiopian faunal element.

Hypsicorypha gracilis (Burmeister, 1838)

Figs 10I, J, 50A–C, 69H, 70E, Map 19

סוּסַת־שֵׂד מְכֻשָּׁפֶת

Body length: ♂ 69.0–73.0 mm, ♀ 78.0–86.0 mm.

Material examined: Israel: *Central Coastal Plain*: 1♀, Hadassim, 12.vi.1953; 1♀, Petah Tiqwa, 12.vi.1965, Student; 1♀, Qesarya Nature Reserve, 15.v.1970, P. Amitai; *Southern Coastal Plain*: 1♂, Ashdod, 19.v.2020, A. More Yossef; 2♂, Neta'im, 18.v.1959, Ch. Lewinsohn; 2♂, Neta'im, 18.v.1959, Ch. Lewinsohn; 1♂, Nizzanim, 28.v.1996; 1♂, Nizzanim, 4.vi.2002, A. Freidberg; 1♀, Nizzanim, 21.iii.2005, C. Grach; 1♂, Nizzanim, 10.vi.2020, A. Weinstein; *Northern Negev*: 1♀, Ashalim, 15.vi.2021, A. More Yossef; 1♂, Be'er Milka, 17.vii.2023, N. Michaeli; 1♀, Be'er Sheva', 14.v.1959, W. Riemer; 1♀, Bor Mashash, 20.iv.2011, A. Freidberg; 1♂, Bor Mashash, 11.iv.2012, A. Freidberg; 1♂, Revivim, 20.v.1953; 1♀, Revivim, 15.v.1956, L. Fishelsohn; 1♀, Shivta junction, 15.iv.2021, A. More Yossef; 1♂, Zomet haNegev, 15.iv.2021, A. More Yossef; *Central Negev*: 1♀, HaMakhtesh haQatan, 26.v.1973, D. Furth; 1♂, Mishor Yamin, 14.iv.1953; *'Arava Valley*: 1♂, Hazeva, 17.iv.1972, J. Kugler (all SMNHTAU).

Northern Negev: 1♀, Gevulot, 25.iv.1954, H. Bytinski-Salz (all PPIS).

General distribution: Algeria, Canary Islands, Egypt, Israel, Kuwait, Libya, Morocco, Niger, Oman, Saudi Arabia, Somalia, Tunisia**.**

Records in Israel: Central Coastal Plain, Central Negev, Northern Coastal Plain, Northern Negev, Southern Coastal Plain, Southern Negev (?), 'Arava Valley.

Biological notes: *H. gracilis* is found in low vegetation: grass, herbaceous plants, thistles and shrubs and steppe. Widespread in the Negev and 'Arava Valley; there is an uncertain record (ootheca) from the Judean Desert. It inhabits sandy habitats along the Coastal Plain regions northwards up to the Caesarea sands area. *H. gracilis* overwinters as nymphs and the adults appear in late spring. Active during the day and night. The ootheca (Fig. 69H, length: 9.5 mm, n=1) (Rauscher, in litt.) is attached onto thin stems of high annuals and contains five to seven eggs in two rows (François 2012). A female can deposit up to six oothecae (Adair 1922).

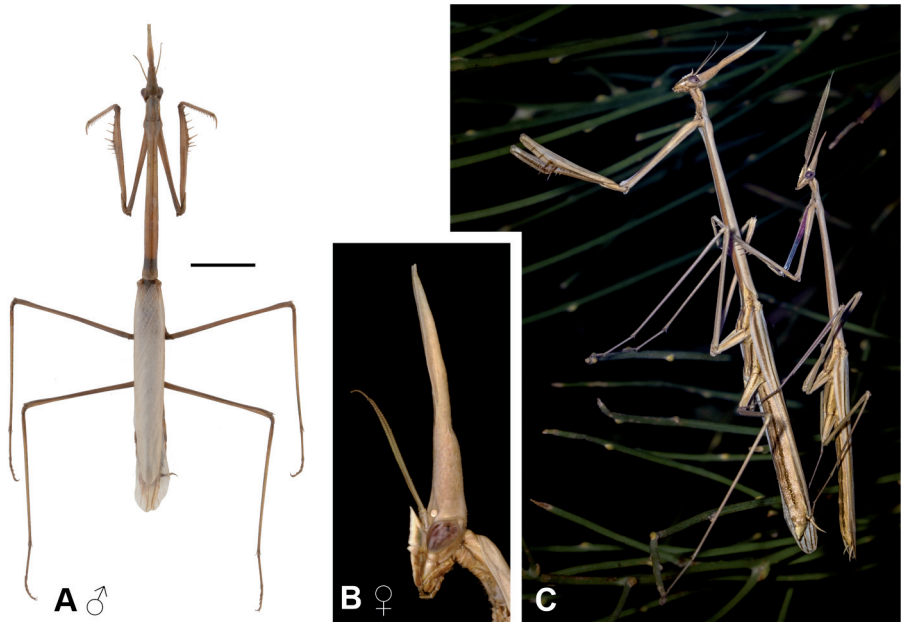


Fig. 50. *Hypsicorypha gracilis*: (A–B) 441406, Be'er Milka, 17.xii.2023: (A) ♂ habitus, dorsal view; (B) ♀ head; (C) Palmahim, 8.x.2021, copulating pair, photo by Lena Yankelovich; scale bar = 10 mm.

Both sexes are macropterous. Adults, mostly males, are attracted to artificial light.

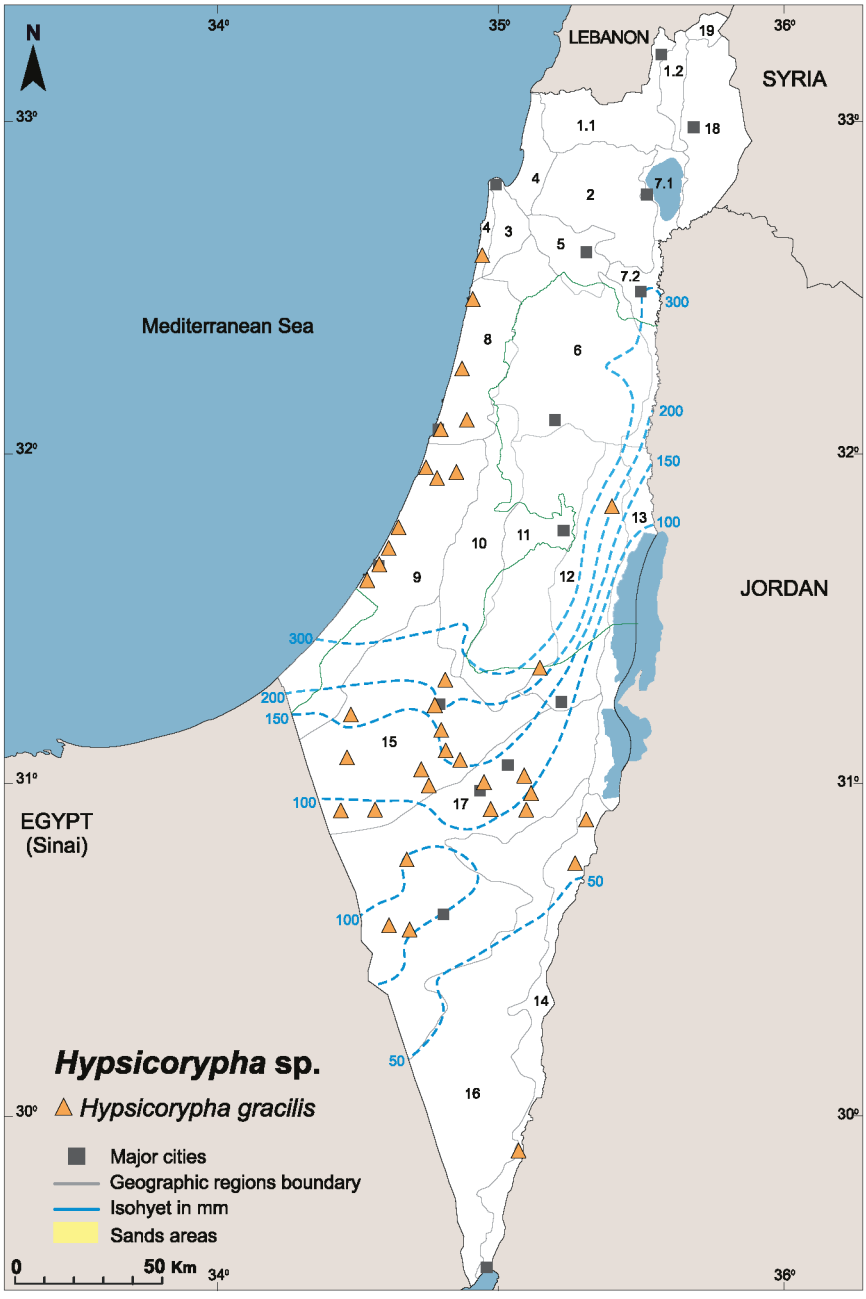
Conservation: Near threatened. Predominantly found in Coastal Plain areas, where sand habitats have been fragmented and mostly lost. Considered rare.

Notes: Similar in appearance to *Empusa* but readily recognized by the absence of lobes on the middle and hind legs, as well as by the very long anterior projection (process) of the head (Uvarov 1924).

Superfamily Mantoidea Latreille, 1802
Family Mantidae, Latreille, 1802
Subfamily Mantinae, Latreille, 1802
Genus *Mantis* Linnaeus, 1758

גְּמַל־שְׁלֹמֹה

This is a widespread throughout most of the Old World, introduced in Australia and North America (Battiston *et al.* 2010). The genus comprises 14 known species and numerous subspecies (Otte *et al.* 2023); only one species is known from the Levant.



Map 19. *Hypsicorypha gracilis*, distribution in Israel.

Mantis religiosa (Linnaeus, 1758)

Figs 14A, 51A–C, 69J, Map 20

גְּמַל־שְׁלֹמֹה מִתְפַּלֵּל

Body length: ♂ 69.0–70.0 mm, ♀ 65.0–89.5 mm.

Material examined: Israel: *Mount Hermon*: 1♂, Newe Ativ, 28.viii.1981, A. Freidberg; 1♀, Newe Ativ, 29.viii.1981, A. Freidberg; 2♂, Newe Ativ, 8.ix.1981, A. Freidberg; *Golan Heights*: 1♀, Allone haBashan, 16.x.2022, U. Levi; 1♂, Jubata ez-Zeit, 7.viii.1969, M. Broza *et al.*; *Hula and Korazim Block*: 1♂, Dafna, H. Bytinski-Salz; 1♀, Hulata, 30.ix.1968, M.P. Pener *et al.*; 1♂, Kefar Blum, 19.vi.1961, J. Wahrman; *Upper Galilee Hills*: 1♀, Har Meron, 14.x.1962, M.P. Pener & P. Amitai; 1♀, Har Meron, 5.x.1976, A. Freidberg; 1♂, Qiryat Shemona, 7.vi.1958, L. Fishelsohn; 1♂, Qiryat Shemona, 27.vi.1967, J. Kugler; *Sea of Galilee area*: 1♀, Bet Zayda Nature Reserve, 19.vi.1972, A. Mizrachi; 1♀, Bet Zayda Nature Reserve, 29.vi.1972, Faunistics; 1♂, Deganya A, 4.vii.1938, Y. Palmoni; 1♂, Deganya A, 4.xi.1939, Y. Palmoni; 1♂, Deganya A, 15.xi.1939, Y. Palmoni; 1♂, Deganya A, 29.v.1941, Y. Palmoni; 1♂, Deganya A, 18.ix.1941, Y. Palmoni; 1♀, Deganya A, 7.xi.1941, Y. Palmoni; 1♀, Deganya A, 19.xi.1941, Y. Palmoni; 1♀, Deganya A, 10.vi.1943, Y. Palmoni; 1♂, Deganya A, 23.xi.1944, Y. Palmoni; 1♂, Deganya A, 7.x.1963, Y. Palmoni; 1♂, Deganya A, 29.x.1963, Y. Palmoni; 1♂, Deganya A, 9.x.1967, Y. Palmoni; 1♂, Deganya A, 11.xi.1969, Y. Palmoni; 1♀, Massada, 26.ix.1941, Y. Palmoni; 1♀, Massada, 7.viii.1969, M. Broza *et al.*; 1♂, Tel Qazir, 19.vii.1955; 1♂, Tel Qazir, *Northern Coastal Plain*: 1♂, Qiryat Hayyim, 9.iv.2005, Y. Ptashkovsky; *Karmel (Carmel) Ridge*: 1♂, Zikhron Ya'aqov, 1.ix.1974, A. Freidberg; *Yizre'el (Jezreel) Valley*: 1♂, Nahalal, 26.x.1946, M. Sternlicht; 1♂, Nahalal, 19.x.1950, M. Sternlicht; *Central Coastal Plain*: 1♂, Bet Berl, 29.x.1980, K. Yefenof; 1♀, Hadassim, 19.x.1953, ; 1♀, Nahal Poleg Nature Reserve, 15.xi.1977, A. Freidberg; 1♂, Newe Yaraq, 12.x.1992, D. Rauscher; 1♂, Petah Tiqwa, 12.xi.1925, F.S. Bodenheimer; 1♀, Ramat haSharon, 10.xi.1977, D. Simon; 1♂, Tel Aviv, 1.x.1945, H. Bytinski-Salz; 1♂, Tel Aviv, 20.x.1959, L. Fishelsohn; *Shomeron (Samaria)*: 1♂, Daliyya, 2.x.1947, H. Bytinski-Salz; 1♂, Nahal Tirza, 9.vii.1967, M.P. Pener *et al.*; *Southern Coastal Plain*: 1♀, Nizzanim, 10.vi.2020, A. Weinstein; 1♂, Rehovot, 1.xi.1954, J. Halperin; *Judean Foothills*: 1♀, Ben Shemen, 10.i.1927, F.S. Bodenheimer; 1♀, Canada Park, 16.vii.2020, A. Weinstein; 1♀, Netiv haLamed He, 29.viii.1967, Beit Shturman; 1♀, Tarum, 31.i.2016, D. Simon; *Judean Hills*: 1♀, Giv'at Ye'arim, 7.vii.2021, A. More Yossef; 1♂, Jerusalem, 1.ix.1941, H. Bytinski-Salz; 1♂, Jerusalem, 20.xi.1949, J. Halperin; 1♀, Jerusalem, 5.viii.1954, S. Blondheim; 1♂, 1♀, Jerusalem, 18.ix.1954, J. Wahrman; 1♀, Jerusalem, 7.x.1954, J. Wahrman; 1♂, Jerusalem, 9.x.1957, J. Wahrman; 1♀, Jerusalem, 15.xi.1964, Katznelson; 1♀, Jerusalem, 22.ix.1965, S. Blondheim; 1♀, Jerusalem, 21.xii.1965, S. Blondheim; 1♂, Jerusalem, 14.x.1971, I. Ris; 1♀, Jerusalem, 30.x.1971, T. Levanony; 1♀, Jerusalem, J. Halperin; 1♂, Jerusalem, *Dead Sea Area*: 1♂, 'En Gedi Nature Reserve, 7.v.1957, J. Kugler; 2♂, 'En Gedi Nature Reserve, 16.viii.1957, J. Wahrman; 1♂, 'En Gedi Nature Reserve, 29.iii.1962, J. Kugler; 1♂, 'En Gedi Nature Reserve, H. Bytinski-Salz; 1♀, Hamme Zohar, 17.viii.1957, J. Wahrman; *Northern Negev*: 1♂, Mash'abbe Sade, 24.viii.1965, J. Wahrman; *'Arava Valley*: 1♂, 'En Yahav, 16.xi.1966, P. Amitai & G. Tsabar (all SMNHTAU).

Yizre'el (Jezreel) Valley: 1♀, Oranim, 20.v.1958 (all OQT).

General distribution: Cosmopolitan: Africa, Asia, Australia (introduced), Europe, North America (introduced).

Records in Israel: Throughout all geographic areas of Israel.

Biological notes: Active all year round. Two color morphs: green shade and yellow-grass shade. Adults and nymphs are often seen on high shrubs and trees. Typically, oothecae (Fig. 69J, length: 30–44 mm, n=2) (Rauscher, in litt.) are deposited from summer to late autumn, on stones (also beneath stones, rarely on top) and occasionally on twigs or wood bark (Kaltenbach 1963). Both sexes are macropterous and adults, mostly males, are attracted to artificial light.

Conservation: Least concern. It is widespread in most parts of the country, apart from the very arid areas. Less common in urban areas.

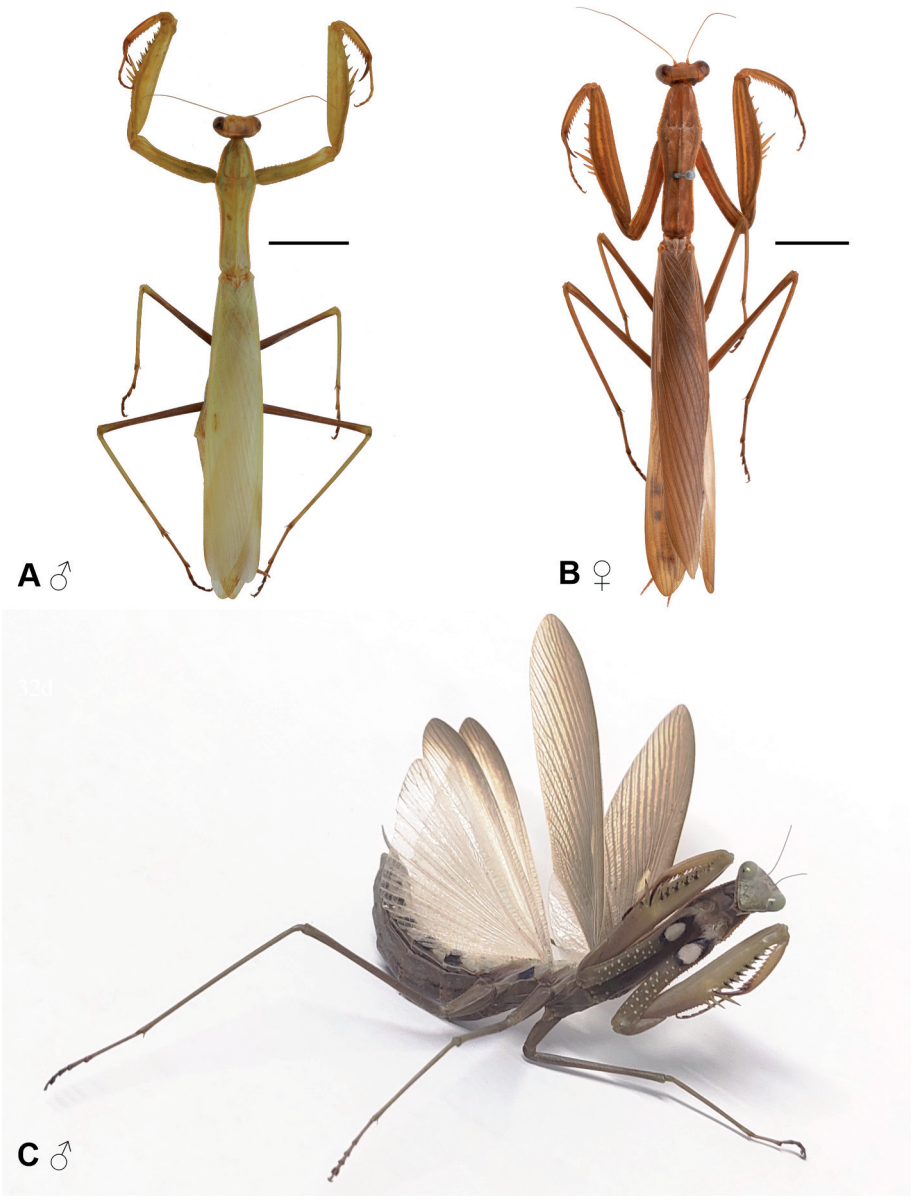
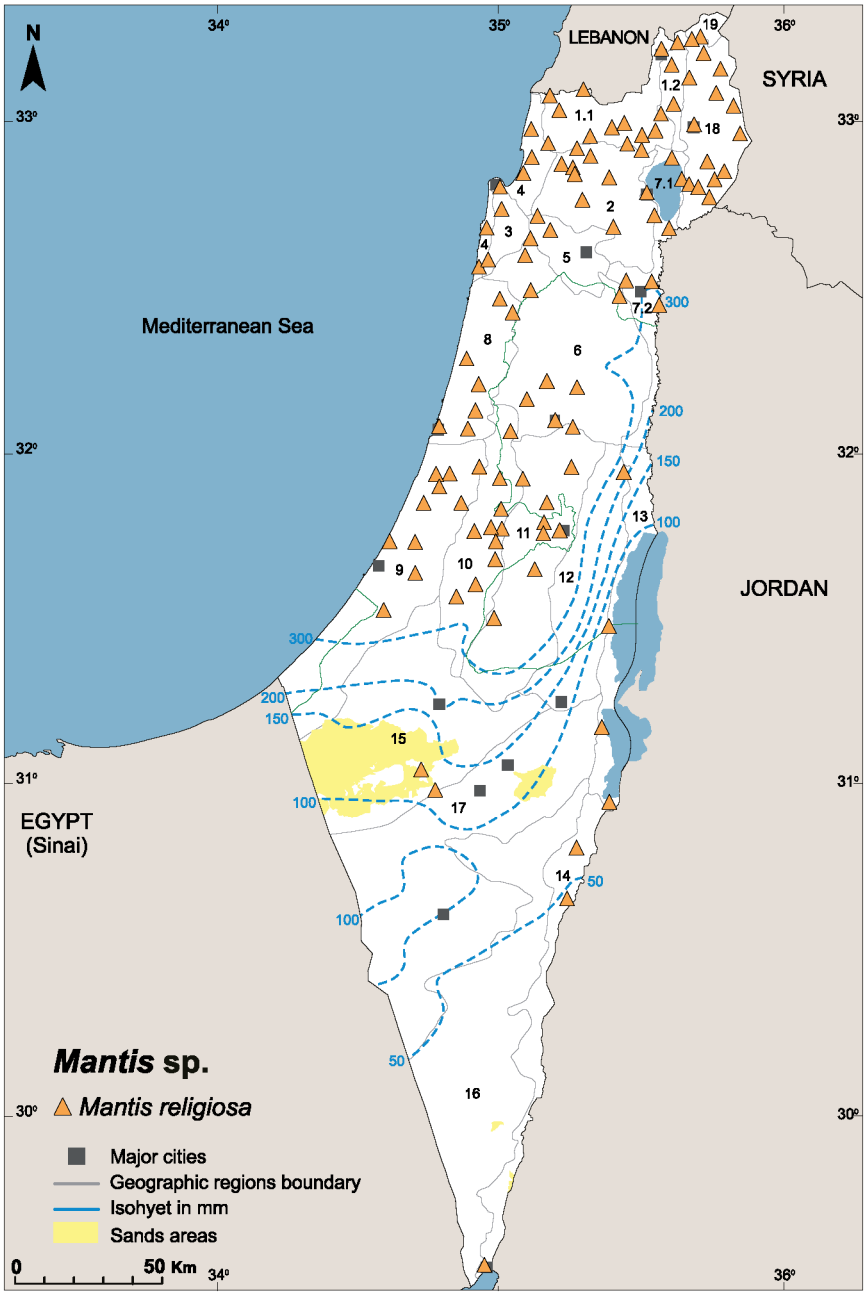


Fig. 51. *Mantis religiosa*: (A) 203679, Hulata, 30.ix.1968, ♂ habitus, dorsal view; (B) 203702, Jerusalem, 7.x.1954, ♀ habitus, dorsal view; (C) Petah Tiqwa, 16.i.2023, ♀ live, habitus, deimatic display, fore coxa with black ringed spot; scale bar = 10 mm.



Map 20. *Mantis religiosa*, distribution in Israel.

Subfamily Tenoderinae Brunner von Wattenwyl, 1893
Genus *Sphodromantis* Stål, 1871

גְּמַל־שַׁלְמָה

The genus comprises 37 species (Otte *et al.* 2023) broadly distributed in Africa south of the Sahara. Only *S. viridis* is present in North Africa, as well as in the southernmost part of Europe and western Asia (Roy 1987). This genus has a distinctive white spot on the forewings. Highly adaptable and very widespread (Battiston *et al.* 2010). Sphodromantis is similar to *Hierodula* Burmeister, 1838, but less robust; it is easy to confuse these two genera.

Sphodromantis viridis (Forskål, 1775)

Figs 14B, C, 52A–C, 69I, 70D, Map 21

גְּמַל־שַׁלְמָה יָרֹק

Body length: ♂ 70.0–82.0 mm, ♀ 73.0–87.0 mm.

Material examined: Israel: *Golan Heights*: 1♀, Ramat haGolan, 9.ix.2005, Y. Ptashkovsky; 1♀, Ramat haGolan, 9.ix.2006, Y. Ptashkovsky; *Hula and Korazim Block*: 1♂, Nehar haYarden, 19.viii.1939, H. Bytinski-Salz; *Upper Galilee Hills*: 1♂, Yehi'am, 20.iii.1979, Gilad; *Sea of Galilee area*: 1♀, Deganya A, 5.xi.1937, Y. Palmoni; 1♂, Deganya A, 15.ii.1938, Y. Palmoni; 1♀, Deganya A, 22.vi.1938, Y. Palmoni; 1♂, Deganya A, 3.vii.1938, Y. Palmoni; 1♀, Deganya A, 12.v.1939, Y. Palmoni; 1♀, Deganya A, 29.v.1941, Y. Palmoni; 1♂, Deganya A, 5.xi.1963, Y. Palmoni; 1♀, Deganya A, 28.ii.1967, Y. Palmoni; 1♂, Kinneret (Qevuza), 23.xi.1936, Y. Palmoni; 1♀, Tel Bet Yerah, 8.iv.1965; 1♂, Tel Qazir, 20.vii.1956, Meshorer; 1♀, Teverya (Tiberias), 17.ii.1968, Y. Palmoni; *Northern Coastal Plain*: 1♂, Qiryat Hayyim, 9.iv.2005, Y. Ptashkovsky; *Karmel (Carmel) Ridge*: 1♀, Haifa (Hefa), 13.vi.1956, Y. Werner; *Yizre'el (Jezreel) Valley*: 1♀, Nahalal, 10.i.1930, Y. Palmoni; 1♀, Nahalal, 9.vii.1949, M. Sternlicht; *Jordan Valley*: 1♀, Bet haShitta, 25.i.1984; *Central Coastal Plain*: 1♂, Balfouriyya, 4.v.1955, S. Milner; 1♂, Bet Yannay, 1.xii.1975, W. Ferguson; 1♂, Ganne Yehuda, 20.ii.1955, A. Rabina; 1♀, Hod haSharon, 8.iii.1981, I. Yarom; 1♀, Ilanot, 10.vi.1958, J. Halperin; 1♂, Kefar haRo'e, 25.iv.1965, S. Blondheim; 2♀, Kefar Sava, 8.xi.1966, M. Dor; 1♀, Petah Tiqwa, 1.iii.1992, D. Rauscher; 1♀, Petah Tiqwa, 2.xi.2022, A. Weinstein; 1♀, Ramat Gan, 5.vi.1946, H. Bytinski-Salz; 2♂, Tel Aviv, H. Bytinski-Salz; 2♂, Tel Aviv, 10.vi.1945, H. Bytinski-Salz; 1♀, Tel Aviv, 12.xii.1957, L. Fishelsohn; 1♀, Tel Aviv, 24.iii.1960, U. Baie; 1♂, Tel Aviv, 2.iv.1982, I. Yalom; 1♀, Tel Aviv, 18.ii.2015; 1♀, Zofit, 21.ii.1955, M. Dor; *Shomeron (Samaria)*: 1♀, Nahal Mishmar, 23.i.1958, M.P. Pener; *Southern Coastal Plain*: 2♀, Ashdod, 2022, A. More Yossef; 1♂, Nezer Sereni, 20.i.1955, J. Halperin; 1♂, Rehovot, 30.iii.1954, J. Halperin; 1♂, Rehovot, 30.iv.1954, J. Halperin; 1♂, Rehovot, 30.iv.1956, J. Halperin; 1♀, Rehovot, 25.v.1956, J. Halperin; *Dead Sea Area*: 1♂, 'En Gedi, 28.vi.1956, J. Wahrman; 6♂, 2♀, 'En Gedi, 16.viii.1957, J. Wahrman; 1♂, 'En Gedi, 23.i.1958, M.P. Pener ; 1♂, 'En Gedi, 30.ix.1960, D. Freund; 1♀, 'En Gedi, 11.xi.1962, Katznelson; 1♂, 'En Gedi, 5.ix.1967, P. Amitai; 1♀, 'En Gedi Nature Reserve, 3.xi.1976, E. Levin; 1♂, 'En Tamar, 24.viii.2017, A. Weinstein; 1♀, 'En Tamar, 26.ix.2017, D. Simon; 1♂, Enot Zuqim, 10.viii.1967, P. Amitai; 1♀, Hamme Zohar, 17.viii.1957, J. Wahrman; 1♂, Yeriho (Jericho), 31.x.1942, H. Bytinski-Salz; 1♂, 1♀, Yeriho (Jericho), 1.xi.1942, H. Bytinski-Salz; 1♀, Yeriho (Jericho), 1.xi.1980; *Northern Negev*: 1♀, Gevulot, 6.vi.1981, E. Shney-Dor; *'Arava Valley*: 1♂, Yotvata, 30.i.1992, A. Eitam; 1♂, Yotvata (Hay Bar) Nature Reserve, 18.xi.2015 (all SMNHTAU).

Yizre'el (Jezreel) Valley: 1♂, Oranim, 18.viii.1953; 1♀, Oranim, 10.xi.1957; *Jordan Valley*: 1♀, Bet haShitta, iii.1975 (all OQT).

General distribution: Algeria, Burkina Faso, Chad, Cyprus, Egypt (type locality), Ethiopia, Greece, Iran, Israel, Italy, Jordan, Kenya, Lebanon, Libya, Mauritania, Morocco, Namibia, Niger, Portugal, Saudi Arabia, Senegal, Somalia, Spain, Sudan, Syria, Tanzania, Tunisia, Turkey (?), Uganda.

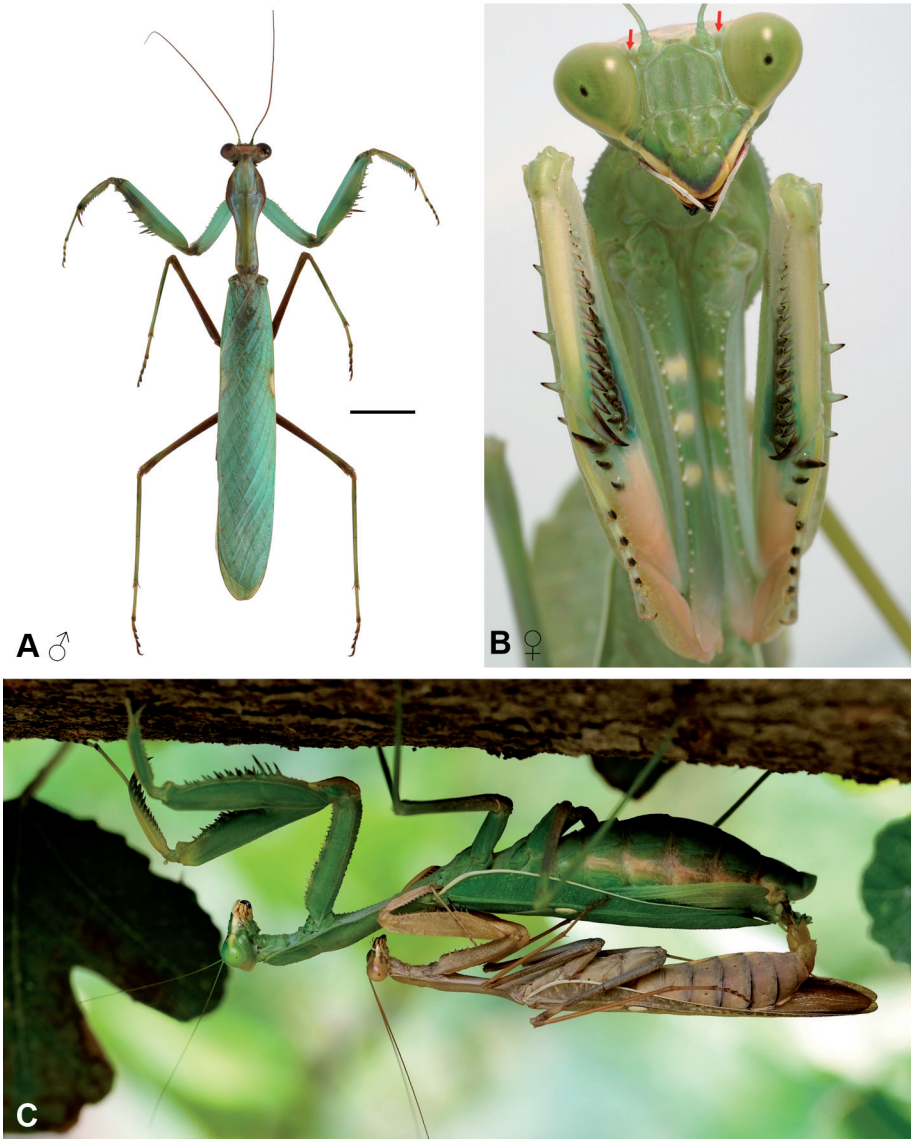
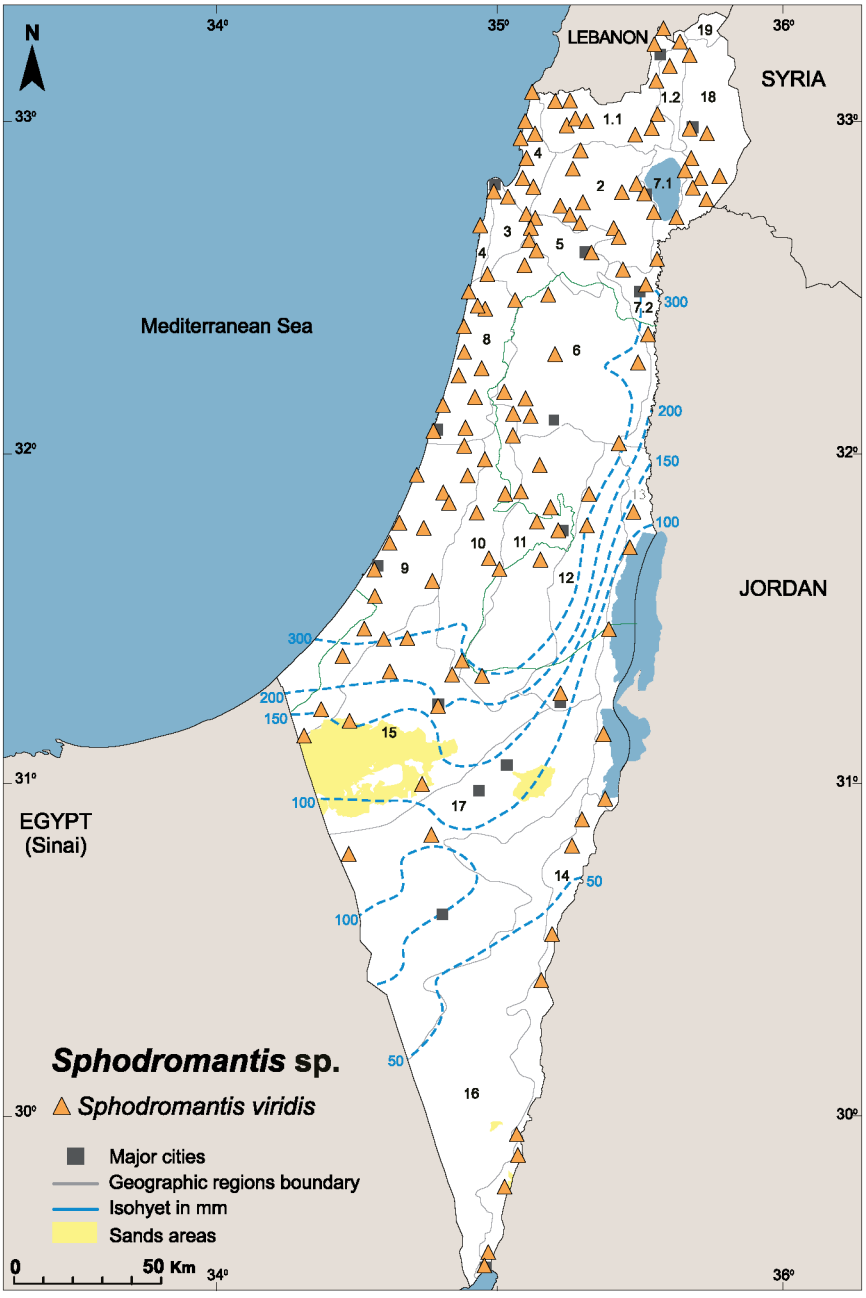


Fig. 52. *Sphodromantis viridis*: (A) reared, ♂ habitus, dorsal view; (B) Petah Tiqwa, viii.2020, ♀ head details; (C) 'En Perat, 6.xi.2020, copulating pair, photo by Moshe Laudon; scale bar = 10 mm.



Map 21. *Sphodromantis viridis*, distribution in Israel.

Records in Israel: Throughout the country.

Biological notes: One of the most widespread species throughout Israel. Found all year round from the extreme desert of the 'Arava Valley and the Negev, through the Mediterranean region, to the northernmost areas of Upper Galilee and the Golan Heights. Common in rural and urban habitats and in agricultural areas. Nymphs and adults are usually seen on shrubs and trees, often lurking near flowers.

A. Barash (1937, 1938, 1939) reviewed the anatomy, biology and behavior of *Sphodromantis viridis*. Both sexes are macropterous, but females rarely fly. Adults, mostly the males, are attracted to artificial light. Two color morphs are recognized: green and brownish-gray. The large pregnant females are fierce predators that can even attack small reptiles (geckos and lizards) and weak songbirds. Adults reproduce year-round, apart from the cold peaks in the winter (depending on location). The ootheca (Fig. 69I, length: 20–49 mm, n=6) (Rauscher, in litt.) is attached onto various objects: natural and man-made.

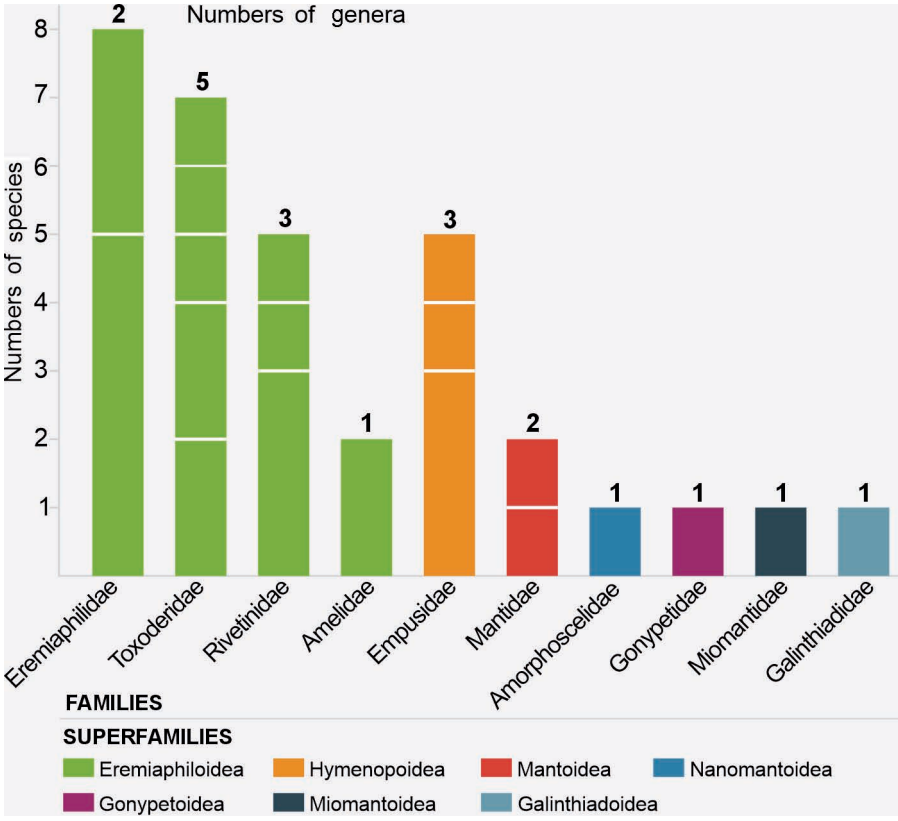


Fig. 53. Number of Mantodea taxa in Israel: 7 superfamilies, 10 families, 20 genera, 33 species.

Conservation: Least concern. Currently one of the most widespread species in Israel.

Notes: First mentioned from Palestine (Jericho, coll. Kneucker) by Krauss (1909). Buxton and Uvarov (1923) remarked: "This species is only found in the coastal region and the Jordan valley". Bodenheimer (1925) disagreed with this statement and remarked: "Very common in the country".

RESULTS AND DISCUSSION

Species and genera according to families and superfamilies

This study lists a total of 33 Mantodea species representing seven superfamilies, ten families and 20 genera, following Mantodea taxonomy in Schwarz & Roy (2019). Out of these, 14 are new records to Israel and the adjacent areas, with seven having been recorded by Rauscher (in litt.), one added by Stiewe *et al*. (2025) and six been added in this study (Fig. 53).

The family Eremiaphilidae, with a total of eight species (24%), is the most species-rich of the ten families in this study. However, it is represented by only two genera: *Eremiaphila* (with 5 spp.) and *Iris* (with 3 spp.).

Toxoderidae is currently the most diverse family of mantids found in the study, represented by seven species (21%) in five genera: *Pareuthyphlebs* (2 spp.), *Severinia* (2 spp.), *Heterochaeta* (1 sp.) *Sinaiella* (1 sp.) and *Roythespis* (1 sp.). Out of the seven species, only *Pareuthyphlebs occidentalis* and *Roythespis israelensis* are considered endemic to Israel. However, based on the distribution of records (Map 14), these species are likely to be present also on the Jordanian side of the 'Arava Valley.

The family Rivetinidae is represented by five species (15%) in three genera: *Rivetina* (3 spp.), *Eremoplana* (1 sp.) and *Microthespis* (1 sp.). The family Empusidae is also represented by five species (15%) in three genera: *Empusa* (3 spp.), *Blepharopsis* (1 sp.) and *Hypsicorypha* (1 sp.).

Mantidae encompass two species (6%) in two genera: *Mantis* (1 sp.) and *Sphodromantis* (1 sp.).

The remaining five families are each represented by a single genus, with the Amelidae represented by *Ameles* and two species (6%). The other families are each represented by one species (3%) as follows: Gonypetidae: *Holaptilon*; Galinthiadidae: *Galinthias*; Miomantidae: *Miomantis*; and Amorphoscelidae: *Perlamantis*.

Zoogeographical distribution

The zoogeographical origin of local species (Fig. 54) is important for understanding their ecology. Although the zoogeographical origin of many species is unclear, it can be assessed from records, maps and literature. The mantid fauna of the Palaearctic region is influenced mostly by Ethiopian elements, with some Oriental elements that have crossed to the southern edge of the Palaearctic (Beier 1968). Indeed, most

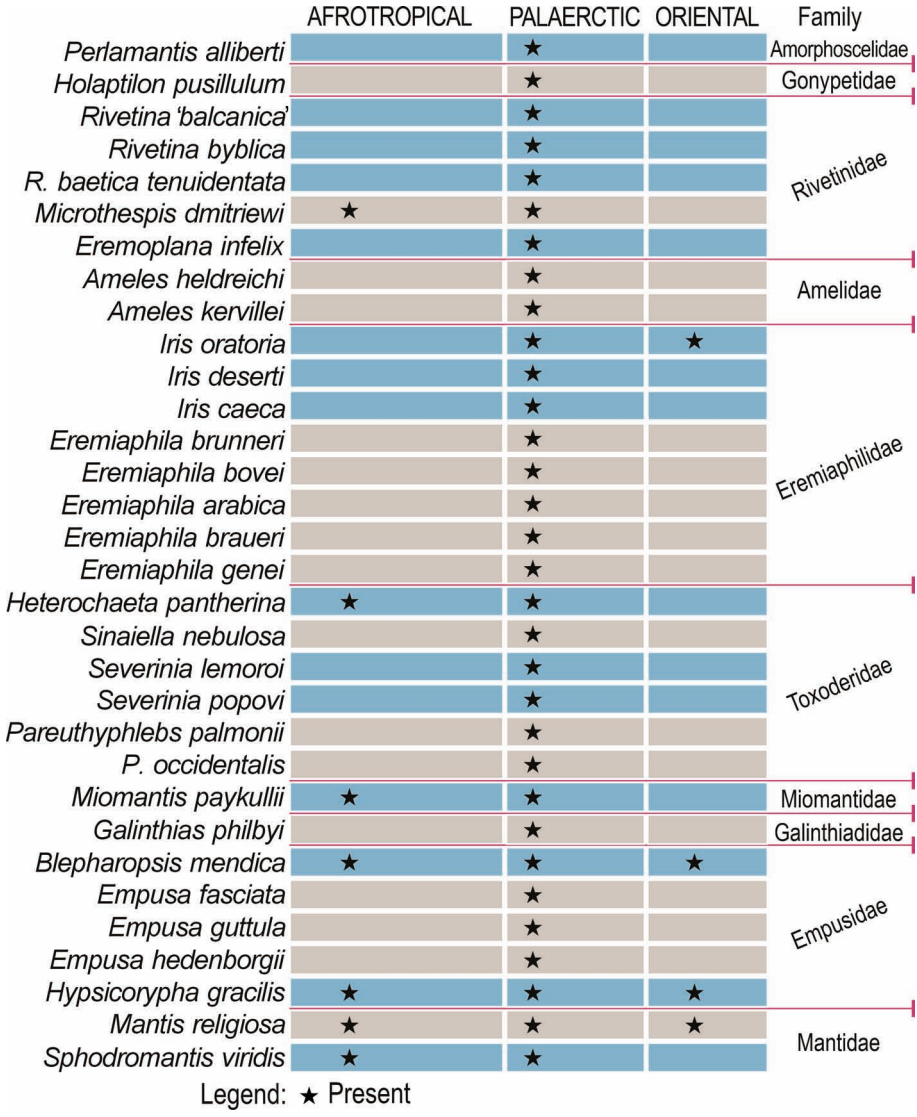


Fig. 54. Zoogeographical origin of Israeli mantids, according to worldwide distribution.

of the local thermophilic genera (*Galinthias*, *Heterochaeta*, *Hypsicorypha*, *Iris*, *Miomantis*, *Pareuthyphlebs*, *Rivetina*, *Severinia*, *Sinaiella*, *Sphodromantis*) that are common in the hot and arid regions of Israel, originate from the north-african/south-asian desert belt or sub-Saharan Africa (Beier 1968; Kaltenbach 1982; Battiston *et al.* 2010).

Species richness according to the biogeographical regions

Animal life, like that of plants, is largely determined by geographic conditions. Zoogeographic regions, therefore, to a certain degree resemble vegetation regions in their extent and borders (Orni & Efrat 1971). In this study, we refer to phytogeographic regions as the basis for our biogeographic map (Maps 1, 2). Defining the phytogeographical regions of Israel was and still is subject to debate among scholars. Israel is divided into four main phytogeographical regions: Mediterranean, Irano-Turanian (IT), Saharo-Arabian (SA) and Sudanian (Zohary 1962). Danin and Plitmann (1987) based on distribution analyses of ca. 2000 plant species in Israel, defined the IT region in the Levant as a transitional region (SA-IT), arguing that there is no real IT region in Israel. Danin and Plitmann (1987), incorporated the Sudanian region within the SA region. Zohary (1962) referred to the Sudanian region as enclaves of desert oases within the SA region (from south of the 'Arava Valley (Map 1, region 14) to north of the Dead Sea area (Map 1, region 13)). The distribution patterns of the local mantids in the arid areas of Israel, when projected onto the phytogeographical map of Danin and Plitmann (1987), nonetheless show a distinct match for most of the species. This correlation with the phytogeographical regions is also viable for the distribution patterns of these arid region species outside of Israel.

In general, mantids are not specialized consumers of specific foods, making their dependence on a certain habitat for nutrition limited only by the availability of prey in that habitat (Kaltenbach 1963). The number of species present in each of the Euro-Mediterranean countries reveals a quantitative decrease with increasing latitude. The current distribution of species richness is well correlated with a region's average annual temperature. Combining species richness and climate reveals that increasing temperature is correlated to an increasing number of species (Battiston *et al.* 2010). This correlation is evident across both genera and species within the Mantodea fauna of Israel and the adjacent areas, according to both biogeographic region and geographic area.

Fig. 55 summarizes species occurrences according to the four biogeographical regions and subregions of Israel and the adjacent areas. The biogeographical map (Map 2) and the biogeographical table (Fig. 55) do not present the actual diverse and blurred boundaries between the regions, which are often unclear locally, interwoven and/or alternating. In practice, it is common to find species of different origins coexisting together, biasing any attempt to assign a species locally to within a specific biogeographical region. However, when looking at a species' main occurrence areas, it is possible to show an affinity to certain biogeographical regions. This affinity is also reflected at the genus level and even at the family level.

Although it might be expected that the highest species richness would be in the greener habitats of the Mediterranean region, the evidence indicates differently. Most of the species (regardless of abundance) are present in more than one biogeographical region.

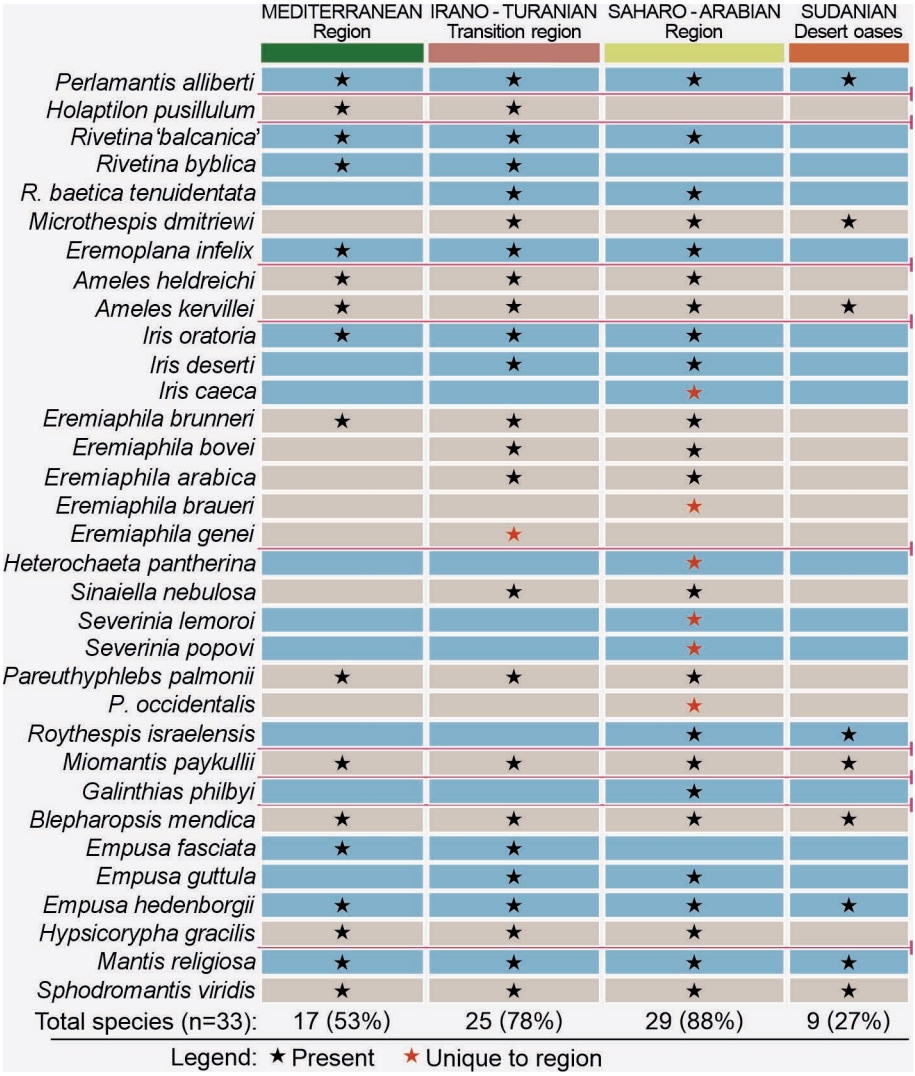


Fig. 55. Presence of mantodean species across four biogeographic regions in Israel irrespective of species numbers.

Seven species (~21%) are recorded from four biogeographical regions and subregions. Eight species (24%) have records from three biogeographical regions and subregions. Ten species (~30%) are recorded from two biogeographical regions and subregions. Eight species (24%) are noted in one biogeographical region and subregion.

The richest biogeographical regions are the SA (regions: 13, 14, 16, 17) with 29 (88%) species and the IT subregion (regions: 12, 15, 17) with 25 (75%) species. Both regions together hold 32 species, of which 21 species (~65% of 32 spp.) share the two regions. Six species have shared records only from the SA and IT regions and six species were found only in the SA region. None of the arid region species are restricted solely to the Sudanian subregion. The two species of *Severinia* are known only from the semi-moist habitat of the saline marshes along the Dead Sea. The greater species richness of the arid areas of the Negev and the Judean Desert is largely due to their size – which totals ca. 60% of the overall area of the country (Orni & Efrat 1971); and probably also due to these areas offering more varied habitats.

Seventeen species (68% of 25 spp.) of the IT subregion are also found in the Mediterranean region. One species (*Eremiaphila genei*) is known only from the high altitudes on Mt Hermon which have also been defined as enclaves of the IT subregion within the Mediterranean region.

Seventeen (51% of 33 spp.) species were present in the Mediterranean region. Of these, 16 species (~94% of 17 spp.) shared both the SA and IT regions and nine of these have a significant affinity to an arid climate. Bi-regional or multi-regional species reflect Israel's and the adjacent areas' patterns of alternating geographical and climatic regions that combine various biogeographic elements within small areas.

Family occurrence in the biogeographical regions (Fig. 56)

Of Eremiaphilidae, seven of the eight species: *Iris* (2 spp.) and *Eremiaphila* (5 spp.), are strongly associated with the SA region and IT subregion. *Eremiaphila brunneri* is also present in the Mediterranean region (probably as a relic). *Iris oratoria* is present in all the biogeographical regions.

Toxoderidae comprise 130 species worldwide (Otte *et al.* 2023), mostly distributed in the Afrotropical and Oriental regions (Wieland & Svenson 2018) and with a minor presence in the Palaearctic region. All seven local species occur in the arid areas of the Negev (regions: 14, 15, 16, 17), only one of which, *Pareuthyphlebs palmonii*, is also present in the Mediterranean region.

Rivetinidae, with three genera: *Rivetina*, *Microthespis* and *Eremoplana*, show a strong affinity to arid, hot and dry habitats, mostly in the SA region and IT subregion. Two species deviate from this pattern: *R. byblica*, which is widespread in the dry habitats of the Mediterranean region; and *R.* '*balcanica*', which is present in the Golan Heights and up to the higher altitudes of Mt Hermon (IT subregion), which is characterized by a hot dry summer and snow coverage with very low temperatures in winter. Only *E. infelix*, a xerothermophilous species, is widespread throughout all the regions (Map 7) and is also recorded from even further north, in southern Lebanon (♀, Bint Jbayl, https://inaturalist.org/observations/30822595).

Empusidae show similar geographical affinities to Rivetininidae. While four of the five species are clearly associated with the arid or hot and dry habitats of the SA region and IT subregion, *E. fasciata* penetrates in the south into the SA-IT

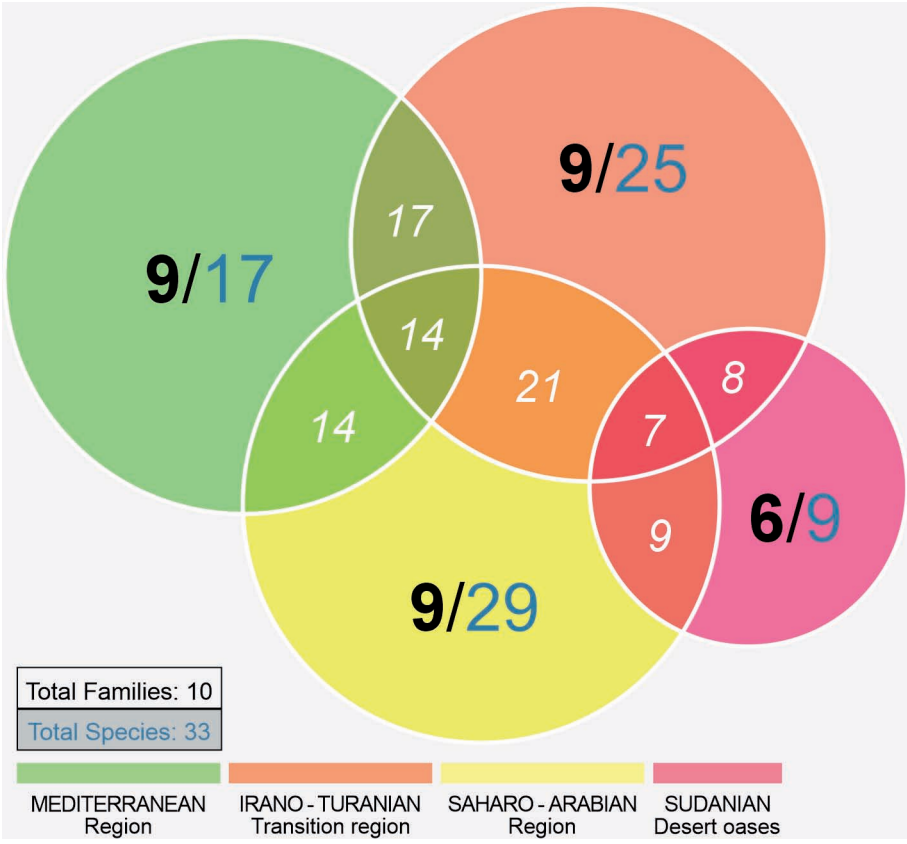


Fig. 56. Family (in bold) and species (in blue) richness according to biogeographical region. White numerals indicate species' co-presence between regions.

transitional region up to the 150 mm isohyet line. Only the xerothermophilous *Blepharopsis mendica* occurs throughout all the regions (Map 17), as well as in southern Lebanon.

The distribution pattern of these two xerothermophilous species of two different families can be explained by their ecological flexibility and the fact that the Mediterranean climate in Israel is hot and dry in the summer and usually not extremely cold in the winter.

The Israeli Amelidae show an affinity to dry habitats. While *A. heldreichi* is widespread mostly in dry habitats of the Mediterranean region, there are also records from desert habitats in the Negev (Map 8). *A. kervillei* shows a greater affinity to arid habitats than *A. heldreichi*. In the eastern habitats of the Mediterranean regions (Map 1, regions 6, 7.1, 12) there is a partial overlap of *A. kervillei* and *A. heldreichi*

distributions. In arid habitats of the Judean Desert, Jordan Valley and in the Western and Central Negev *A. kervillei* is the dominant species of the two. The ecological preferences of these two species are still poorly known and need further study.

Amorphoscelidae, represented by *Perlamantis alliberti*, are present in all the biogeographical regions apart from the northernmost areas and in different habitats whose common denominator is a bushy landscape (Map 3). We assume that their dispersion pattern is influenced by climate conditions, although there is still a lack of data to support this.

Gonypetidae, represented by *Holaptilon pusillulum*, occur in the shrubland of the Mediterranean region. Sporadic records are known from arid habitats in the high Negev and the Judean Desert plateau in the 'Arad area (Map 4). These records suggest a much wider distribution that also includes the semi-arid and arid regions of Israel, once again highlighting the limited knowledge of desert Mantodea fauna.

Galinthiadidae, represented by *Galinthias philbyi*, occur in the SA area in the 'Arava Valley and parts of the southern Negev, limited to the canopy of the acacia trees.

Mantidae, represented by *Mantis religiosa* and *Sphodromantis viridis* and Miomantidae, represented by *Miomantis paykullii*, occur in all the biogeographic regions and subregions, in both natural and urban habitats. It is interesting that no single family, not even a single genus, is exclusive to the Mediterranean region of Israel. All the families and genera that are represented in the Mediterranean region are also present at least in the IT subregion.

Species richness according to geographical area

Based on records only, the mantid species' richest geographical areas (Fig. 57) are the arid regions: the Central Negev (Map 1, region 17) with 22 species, the Northern Negev (Map 1, region 15) with 21 species, the Judean Desert (Map 1, region 12) with 21 species, the 'Arava Valley (Map 1, region 14) with 20 species and the Dead Sea area (Map 1, region 13) with 17 species. The Southern Negev (Map 1, region 16) with 17 species, reveals a relatively low number of species and we assume that this is due to a lack of data, as this remote area is difficult to survey and it remains least studied. Eight species share these six geographical areas, which together host 31 species in total. This is not surprising, in light of the thermophilic nature of these genera and species and the zoogeographical origin of the genera.

The lowest species richness for a geographical area was found to be on Mt Hermon, with eight species. Of these, four genera (five species) are associated with a dry climate. This is not unexpected considering the extreme climate there: "The coldest month is January with a minimal average temperature of -2.8°C and the lowest temperature recorded -13°C. July is the warmest month with a maximal average temperature of 19.5°C and a maximal temperature of 26°C. Relative humidity during winter is 65–75%. During the rest of the year, it is between 30–50%, while in autumn and spring it may fall as low as 5–10%" (Haim *et al.* 1993). This is the only area in Israel where mantids may enter a true winter diapause

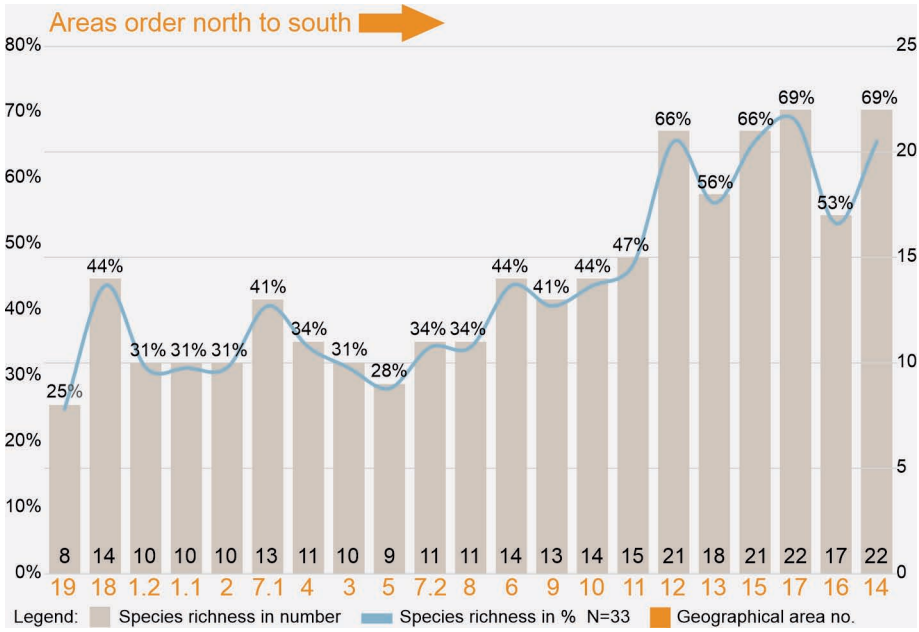


Fig. 57. Species richness according to geographical area: 1. Upper Galilee: 1.1. Upper Galilee Hills, 1.2. Hula and Korazim Block; 2. Lower Galilee; 3. Karmel (Carmel) Ridge; 4. Northern Coastal Plain; 5. Yizre'el (Jezreel) Valley; 6. Shomeron (Samaria); 7. Jordan Valley and Southern Golan: 7.1 Sea of Galilee area, 7.2 Jorden Valley; 8. Central Coastal Plain; 9. Southern Coastal Plain; 10. Foothills of Judea; 11. Judean Hills; 12. Judean Desert; 13. Dead Sea Area; 14. 'Arava Valley; 15. Northern Negev; 16. Southern Negev; 17. Central Negev 18. Golan Heights; 19. Mount Hermon. Representation is irrespective of recorded numbers.

(at least from the altitude of 1600 m and above) beneath the snow, probably as ootheca and then develop quickly during the short spring and summer. *Rivetina* and *Eremiaphila* deposit their eggs into the ground, *Ameles* deposit under stones, where they are probably better protected from the cold. Below 1500 m the winter is less harsh and the mantids can survive winter time as nymphs.

Species occurrence according to vegetation type

Although determining vegetation preference of the mantids was not one of the main aims of this study, we were able to partially summarize this (Fig. 58) as acquired from field trips, random observations during collecting and data obtained from photos published by social groups (Facebook 2024; iNaturalist 2024) – given the limitations of such snapshot documentation.

Vegetation plays a significant role in the life of most mantids, serving as a hunting site, refuge and substrate for ecdysis and ootheca deposition. Different species

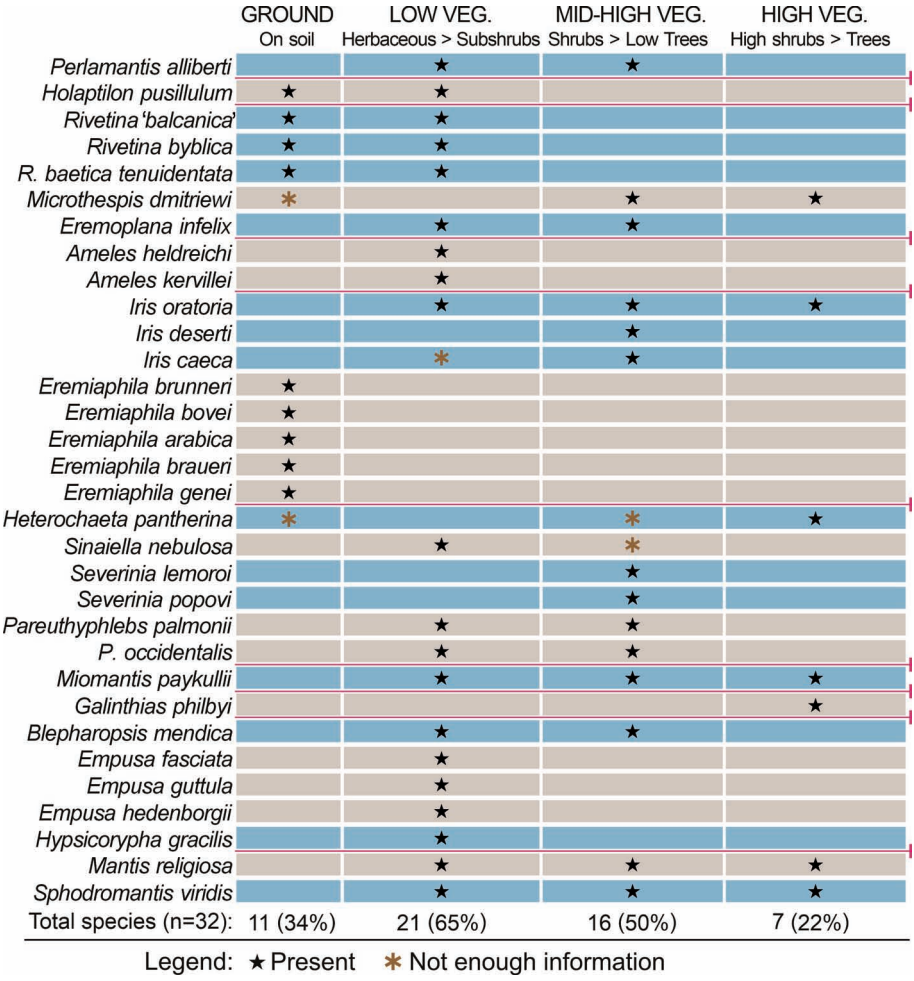


Fig. 58. Habitat preference according to vegetation type.

tend to prefer different types and parts of the vegetation, and this preference often changes during their life cycle, resulting in changes in their body morphology, texture and coloration.

Ecologically, one can divide Mantodea into three main groups, with perhaps some overlap (Beier 1968).

The first group comprises species occupying woody habitats, together with shrub and tree-dwellers and bark-dwellers. Members of this group tend to move slowly, be sit-and-wait predators and are characterized by a morphology and camouflage adapted for life on branches and in foliage.

The second group comprises the species that inhabit open grass and scrubland. The members of this group are adapted to moving quickly in the grass and among low-growing plants. Their colors tend to be light, matching the grass colors.

The third group is best characterized as ground-dwellers and comprises fast-moving, active-search predators that dwell on the ground surface and rarely interact with plants.

The first group is the most representative by number of species of the mantodean fauna of Israel. *Galinthias philbyi* represents a true arboreal species. Most of the other group members: *Sphodromantis viridis*, *Mantis religiosa*, *Blepharopsis mendica*, *Miomantis paykullii*, *Microthespis dmitriewi*, *Pareuthyphlebs* spp. and *Perlamantis alliberti* inhabit a range of vegetation types from shrubs to trees, both as nymphs and adults. Most of those species are considered as good flyers, both males and females. The oothecae tend to be deposited on various vegetation parts. We were surprised to find that the first or second instars of *Microthespis dmitriewi*, whose oothecae are typically deposited on shrubs and trees, were observed (at night) on the ground near a light trap in an open area, whereas adults were never seen on the ground.

The second group is variable, with genera such as *Ameles* and *Rivetina* that inhabit steppe areas and grasses, to genera that inhabit herbaceous plants and sub-shrubs, such as *Empusa*, *Hypsicorypha* and *Blepharopsis*; and genera that inhabit shrubs, such as *Iris*, *Eremoplana*, *Sinaiella* and *Severinia*. In many species within this group, females are brachypterous. Depending on the species, the oothecae are deposited on various parts of plants, on rocks, or in the soil. *Blepharopsis mendica* nymphs are common on flowering herbaceous plants whereas the adults typically remain on shrubs and trees.

The third group is the smallest and its representatives occur in open habitats in arid areas, particularly in the Negev. This group is dominated by the genus *Eremiaphila*, with four of its five species being common in the Negev and depositing their oothecae in the soil. When disturbed, they tend to run quickly and then freeze, blending in with the surrounding background due to their camouflage pattern. In *Rivetina*, which also deposit their oothecae in the soil, the small and medium-size nymphs and even adults can be found active on open ground, but seek out grass patches if disturbed.

Species occurrence in adjacent countries

Israel's borders with the adjacent countries mostly reflect political borders rather than geographical or ecological ones. Considering the number of species of Mantodea recorded from the adjacent countries and the number of species common to several countries (Fig. 59), especially species that are known from the vicinity of the political borders, there is clearly a need for updated reviews and additional collection data from previously unsampled areas in these countries.

Despite the expectation that species listed from Israel or Egypt would also be reported from the Sinai Peninsula, the records of mantids from Sinai are sparse. This

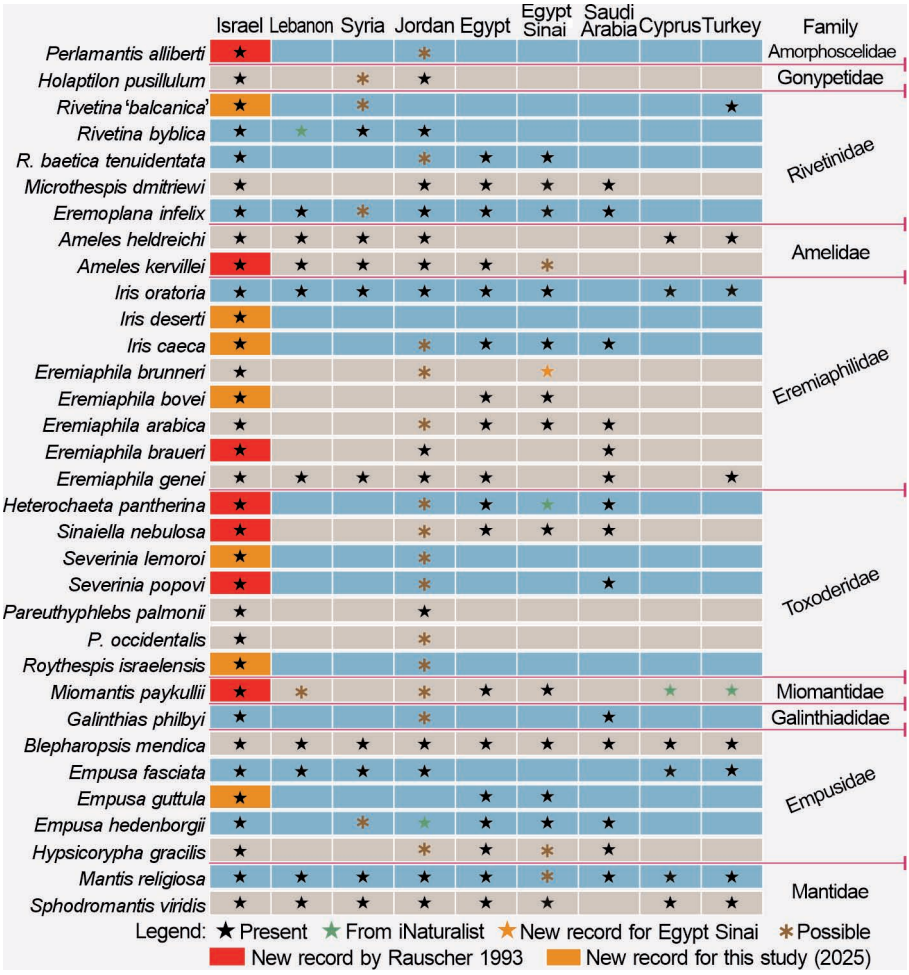


Fig. 59. Occurrence in adjacent countries. Orange star indicates records from the SMNHTAU collection. An asterisk suggests a high probability of their occurrence across the border due to a close presence to the political border with these countries. The Sinai Peninsula (Egypt) is listed separately from the mainland of Egypt.

gap in the data can be explained by the difficulties inherent in exploring many areas in the Sinai, as well as in the remote areas of Jordan. *Pareuthyphlebs occidentalis* and *Eremiaphila brunneri* are currently considered endemic to Israel. However, listing a species as endemic may simply reflect a lack of available data. It is possible that these two species will also be found in Jordan in the future. Interestingly, a single specimen of *Eremiaphila* cf. *brunneri* (SMNHTAU In.210880) was collected in June 1968 in Wadi Zawatin, in the southern Sinai, Egypt (Fig. 34).

Seasonal occurrence

The seasonal occurrence is summarized in Fig. 60, based on the SMNHTAU data records and dates retrieved from photographic records published by social media groups (Facebook 2024*a*, *b*; iNaturalist 2024). The gaps in the seasonal occurrence records reflect more a lack of information than the actual situation, especially for those species that are rare, elusive, or have a very limited distribution. For the more common species, however, especially in anthropogenic environments, records are widely available. For example: *Miomantis paykullii* and *Sphodromantis viridis* are the most reported species by the public from both natural areas and urban spaces (cities and rural areas) and can sometimes be observed daily.

The information provided here pertains only to the seasonal occurrence of adult individuals, without accounting for the anticipated variation in activity levels across the north-to-south climate gradient. Species that have a wide distribution from north to south may exhibit year-round activity and reproduction in the south, while only producing a single generation annually in the colder regions located farther north.

While copulation and ootheca deposition events are only infrequently observed in natural habitats, they nonetheless provide valuable information to assist future ecological studies. It should be noted that, aside from the rare cases mentioned in the remarks and Fig. 60, the data on copulation and ootheca deposition in this study were collected from both natural and urban habitats.

Limitations of the study

This study was based chiefly on the species morphology. While for most genera and species this was workable, for several genera a reliance on morphology alone made absolute identification difficult. The genera *Ameles*, *Rivetina* and *Empusa* display considerable intra- and interspecific variability in both external morphological and genitalia characters. For some species in these three genera, the available descriptions and keys were insufficient for establishing valid identification to species level. Comparative molecular information on the relevant species is typically either unavailable or does not exist. The results of our study indicate that the status of the species of *Ameles*, *Rivetina* and *Empusa* in the Levant needs reassessment within a broader framework of regional revision. Such revision, along with the addition of earlier museum material from Europe, should include both fresh material and museum material from the adjacent countries.

Assessment of mantid collection status in Israel

The SMNHTAU Mantodea collection holds about 2400 specimens (adults and nymphs), acquired from independent collectors and incorporating several academic and private collections that in total reflect over 100 years (1915–2023) of fieldwork in Israel (Fig. 61).

Throughout the years Mantodea collecting in Israel and the adjacent areas has been inconsistent and does not accurately reflect all the areas and habitats. The

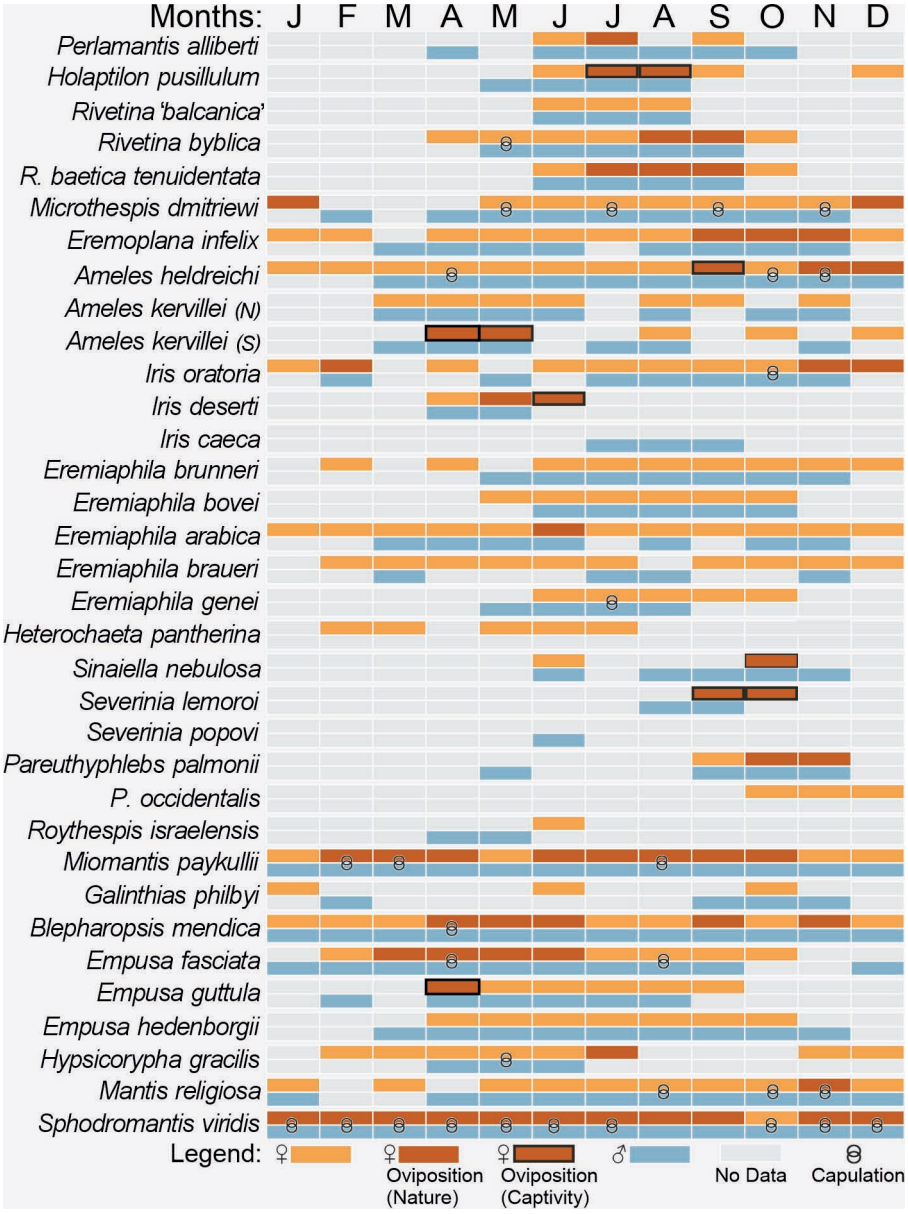


Fig. 60. Seasonal occurrence – a graphic representation. Seasonal appearance of the adults with additional records of copulation and oviposition. Irrespective of specimen numbers.

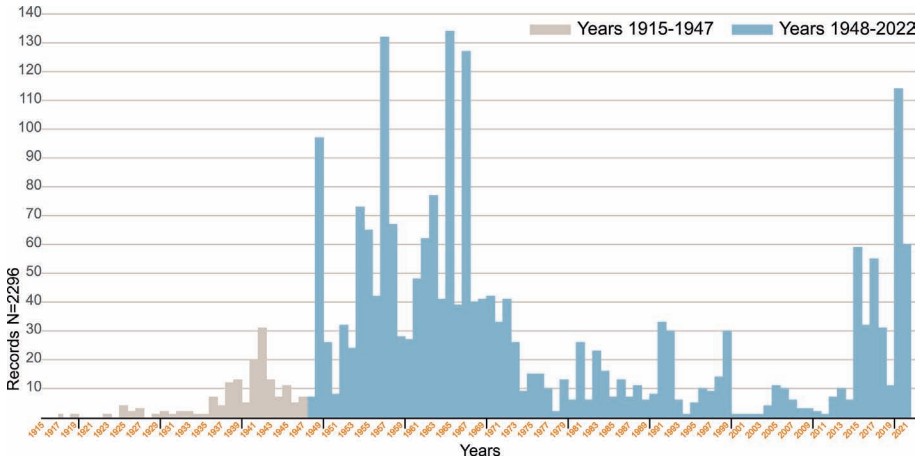


Fig. 61. Annual collecting of mantid specimens. Based on the SMNHTAU records, including year of collection.

result is expressed in a dearth of knowledge regarding both species' distribution and seasonal occurrence. Some geographic regions are barely represented in the collection; and some of these areas were and still have restricted entry due to security reasons or to their remote location and harsh terrain conditions. We can also add to this the low scientific and public awareness of the group, even when biological surveys are carried out in different areas, especially in nature reserves. We hope that this study and the key to species identification will result in greater awareness of the group among the local scientific community and will lead to greater attention to the group in ecological studies and surveys.

Collection methods and elusive species

Traditionally, collecting mantids is carried out using several techniques, active and passive: visual inspection (day and night, on the ground or searching among vegetation), net sweeping (day), probing vegetation with a long stick (day and night), foliage beating (day and night), ground surveying with eyes (day), flashlight surveying (night) and light trapping with visible light or / and black light (UV) (night). Different collection methods can be used to target different species of mantids according to their lifestyle and habitat, different life stages, or even different sexes. Light trapping is much less effective with brachypterous species, brachypterous females and gravid females. Although males of many species are good flyers, they do not tend to be attracted at night to random lights, and it is sometimes easier to find them beside the permanent illumination of a building or on other man-made facilities. A light trap is also less effective in windy conditions or in areas affected by light pollution.

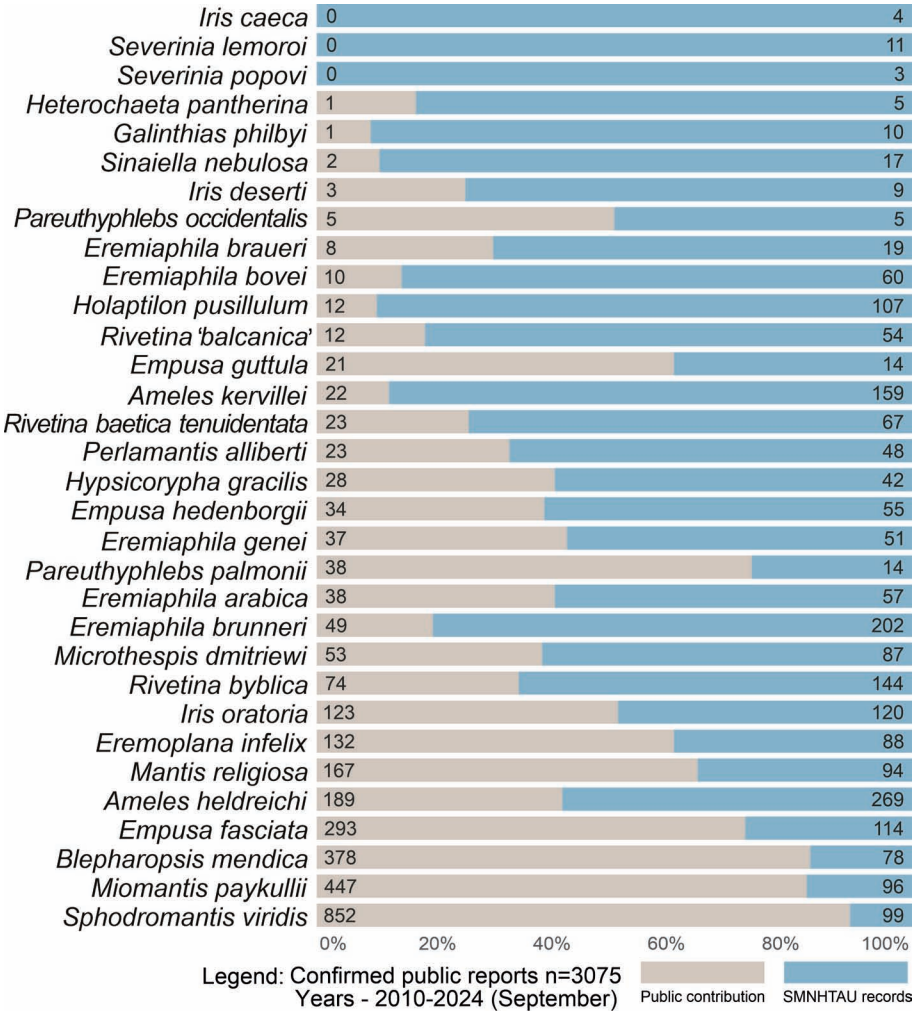


Fig. 62. Contribution of citizen reports. Facebook groups' records vs SMNHTAU collection records.

Some of the rarer species in the SMNHTAU were collected in the past using a light trap (according to the collection notes). However, our efforts to recapture these species with a light trap (at the same locations and time of the year) failed. We were nonetheless able to collect the same or other species near the light trap by means of visual observations on plants while using a flashlight. Some of the interesting specimens we have received from the public were collected near a permanent light fixture or with the help of a flashlight. From our own experience,

we recommend combining a light trap with adjacent visual observations with a flashlight for the nocturnal collecting.

Citizen Science – a unique contribution

Citizen science, broadly defined as public participation in scientific research and knowledge production, is becoming an increasingly well-developed and valued approach with a global reach and used in a wide range of scientific domains (Fraisl *et al.* 2022). The current study combined public records (locations, dates, photos) originating mostly from social networks like Facebook and iNaturalist.

Citizen-science data facilitate virtual access to many areas during a given time period, also enabling reports from areas that are inaccessible to most of the public. This has resulted in the addition of valuable information on species' localities, seasonal occurrence, behavior, reproduction and other important ecological aspects.

The citizen-science data for this study were sourced mainly from two local Facebook groups: Mantodea Group of Israel (Facebook 2024*b*) and a group covering the local entomology in general (Facebook 2024*a*). We utilized a total of 3075 confirmed reports (out of 3112) from 1667 observers, covering 29 species and approximately 930 localities across the country. iNaturalist data (2024) (which comprised a total of 1730 reports and of which 19 were confirmed species were less useful; and some of the records overlapped with the data obtained from the Facebook (2024*a*, *b*). Therefore, this latter source was used primarily as supplementary data for rare species or remote localities.

Citizen-science reports provide new data, support site evaluations and fill in gaps in museum records (Figs 62, 63), contributing to a better understanding of species distribution and behavior, for both rare and common species, such as in confirming the presence of *Holaptilon pusillulum* in the Golan Heights. The significant importance of the photographic documentation is demonstrated in the discovery of a new species for Israel – *Iris deserti* – which was previously unknown from the Levant and was not represented in SMNHTAU. The collaboration between science and the public has also helped to raise awareness of the Mantodea Group of Israel (Facebook 2024*b*), resulting in an increase in photographed observations as well as new materials for the collection, some of which had previously been represented in the collection by only a few specimens, such as *Sinaiella nebulosa*.

Invasive species – feasibility assessment

Worldwide, invasive species of Mantodea have been known from numerous studies for many years (Schwarz & Ehrmann 2018). The findings from the current study did not indicate any likelihood of the presence of invasive mantodean species in Israel or in the adjacent areas and countries.

The dispersal of mantids depends on three main factors: the ability of the females to fly, the human factor and the landing biotope (Beier 1939; Ehrmann 1996). Brachypterous females are always flightless and adult macropterous females are only able to fly up to about three weeks after the imaginal ecdysis. After the

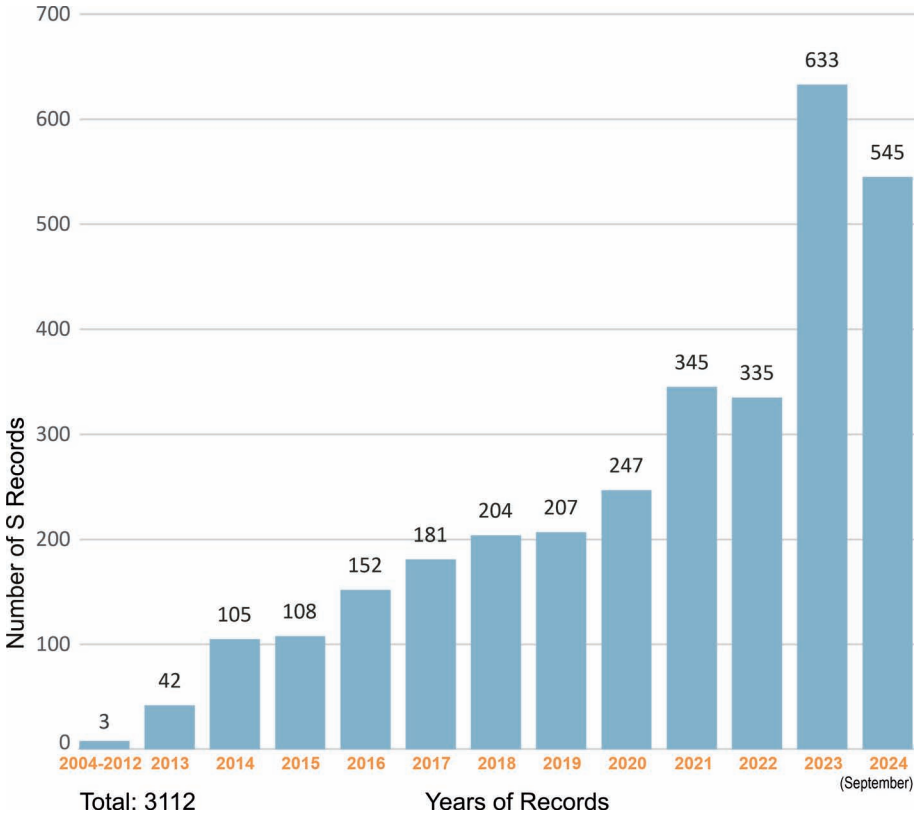
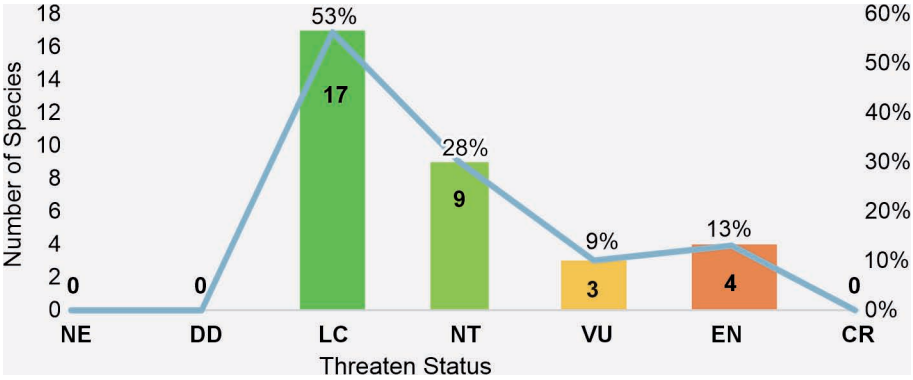


Fig. 63. Number of the Facebook public Mantodea reports contributed annually.

female mates and due to increased food intake, her abdomen swells very quickly and this limits the female's ability to fly. Therefore, the dispersion of oothecae by anthropogenic means is the most likely scenario for long-distance dispersal (Ehrmann 1996). In a world of free market, natural and ecological barriers are no longer considered as barriers to dispersal (Marabuto *et al.* 2014). Hence, three paths and vectors for mantid introduction into Israel and the adjacent areas can be posited: (1) natural dispersal within the Mediterranean basin; (2) indirectly via cargo ships or other means of transportation; (3) and through breeders who keep alien species (Marabuto *et al.* 2014; Moulin 2020; Battiston *et al.* 2022).

The main concern for the Levant is the genus *Hierodula* Burmeister, 1838, which is currently known in Europe and western Asia (Turkey) from two species: *Hierodula tenuidentata* Saussure, 1869 and *Hierodula patellifera* Serville, 1839. Both species are of South-East Asia origin, highly adaptable and slowly spreading



Map 22. Hotspots of threatened species projected on the statutory protective level of natural or wooded areas, after Ben-Moshe and Renan (2022).

from the Caucasus into Central and Southern Europe and Eastern Turkey, mostly through transportation (sea and land) and trade. (Ehrmann 2011; Battiston *et al.* 2018; Cianferoni *et al.* 2018; Moulin 2020; Sevgili & Yılmaz 2022; Vujić & Ivković 2023). Sevgili & Yılmaz (2022: 354) noted: "*Hierodula tenuidentata* <…> has invaded a very large area in Greece including many Aegean islands but has been reported from very few places in Western Anatolia and the Marmara region in Turkey, although both areas have a similar climate and habitat characteristics. It is therefore assumed that the number of records reflects the lack of detailed monitoring studies".

Concerning alien pet mantids as a potential for invasive species in Israel, the Israeli Plant Protection Regulations (MOAG 2009) ban all imports, without a legal permit, of live invertebrate animals, including insects at any developmental stage. Nevertheless, keeping alien species of exotic mantids as pets in Israel is known – albeit not widespread, to the best of our knowledge. To date there are no known reports of alien mantid species from either urban or natural public spaces in Israel. Nevertheless, this issue cannot be underestimated and highlights the importance of responding to public observations and of the citizen-science contribution in monitoring invasive species.

Conservation aspects

The global decline of the entomofauna (van der Sluijs 2020) has also affected ecosystems in Israel (Fig. 64). The habitat loss, degradation and fragmentation (Map 22) are among the major reasons for this phenomenon (Gabbay 1997; Ben-Moshe & Renan 2022).

Arid ecosystems such as sandy habitats, loess plains, gravel plains and dry and wet salt marshes in the Negev Desert and along the 'Arava Valley are subject to fragmentation, degradation and vast development pressures (Ben-Natan 2013;

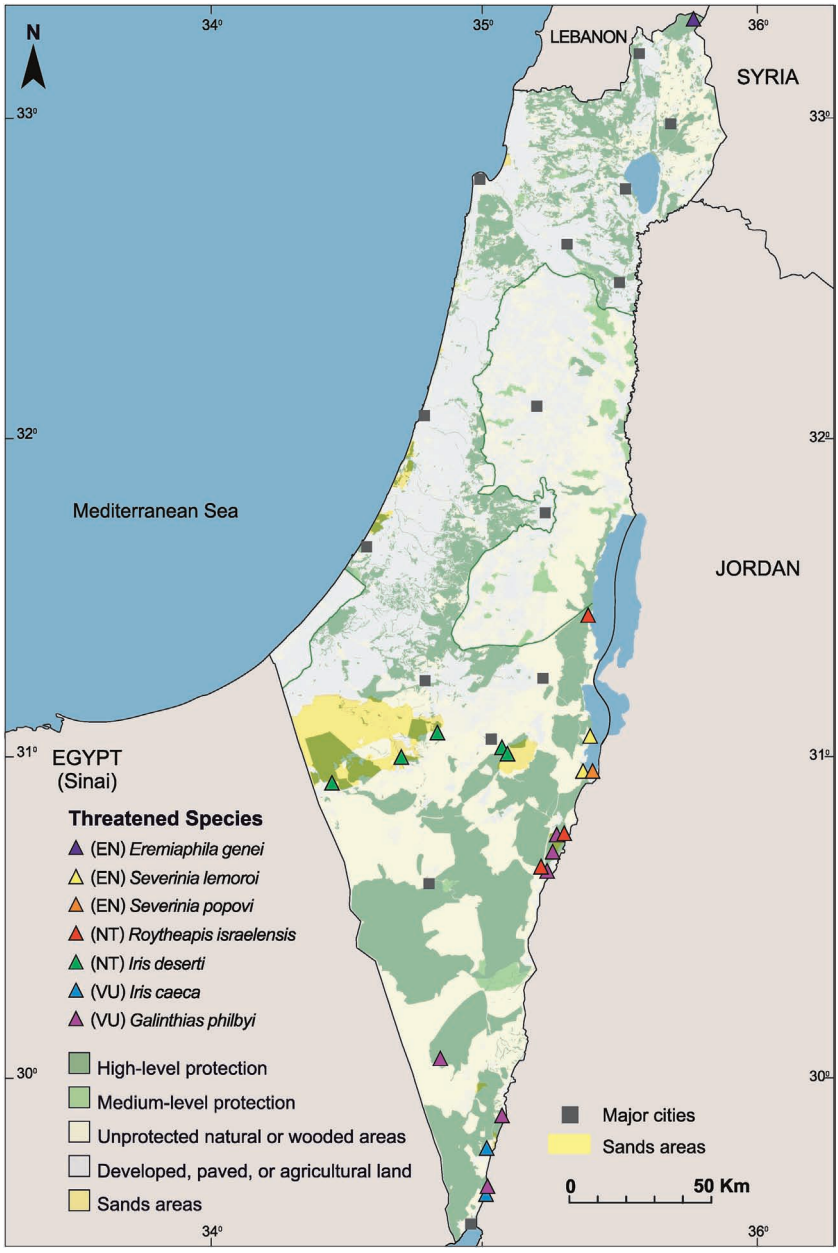


Fig. 64. Threat Assessments of Mantodea Species in Israel. Utilizing the IUCN Red List Terminology (IUCN 2025).

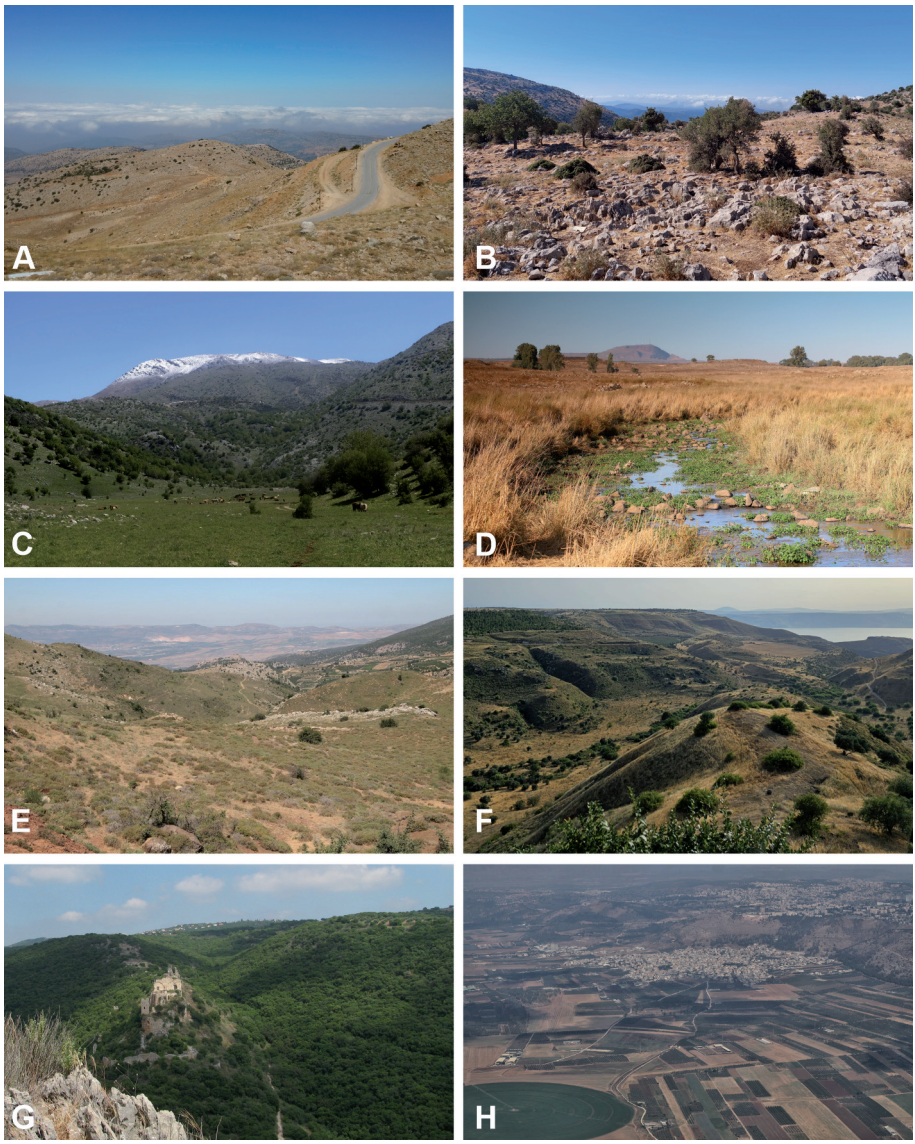


Fig. 65. Habitats in northern Israel: (A) Mount Hermon (alt. 2,000 m); (B) Mount Hermon (alt. 1,650 m) (C); Mount Hermon (Berekhat Man, alt. 1,400 m), photo by Moshe Laudon; (D) Golan Heights (center, steppe), https://pixabay.com/photos/golan-heights-field-and-stream-176914, CC0; (E) Golan Heights (northwest), view to the Hula Valley, photo by Hanna Martiskainen; (F) Golan Heights (southwest, Nahal Afik, garrigue and steppe), photo by Hadar Chadad Korenblum; (G) Upper Galilee Hills (Nahal Keziv, forest), https://pixabay.com/photos/israel-landscape-mountains-forest-84134, CC0; (H) Lower Galilee and Yizre'el (Jezreel) Valley (agriculture landscape, ariel view), photo by Hanna Martiskainen.

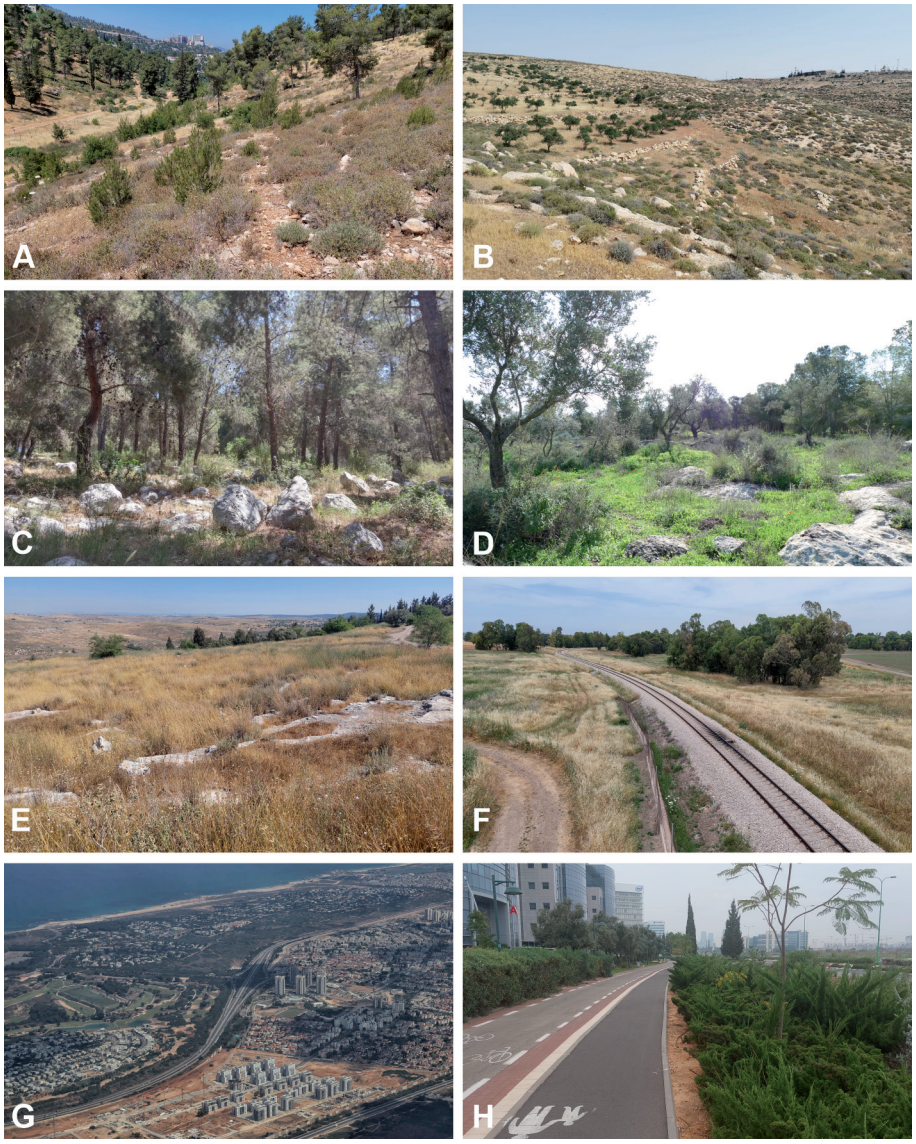


Fig. 66. Habitats in central Israel: (A) Judean Hills, shrubland; (B) Judean Desert, Al Kanub Nature Reserve, semi desert, photo by Boaz Shacham (C) Judean Hills, pine forest; (D) Foothills of Judea, shrubland; (E) Foothills of Judea, steppe; (F) Foothills of Judea, agriculture landscape; (G) Central Coastal Plain, northwest to Qesarya (Caesarea), sand dunes and urban landscape, aerial view, photo by Hanna Martiskainen; (H) Central Coastal Plain, urban gardening.

Fig. 67. Habitats in southern Israel: (A) Northern Negev, Be'er Milka, sands, photo by Noah Michaeli; (B) Central Negev, Yeroham, rocky shrubland, photo by Hanna Martiskainen; (C) Dead Sea area, 'En Tamar, abandoned palm plantation in salt marsh; (D) Central Negev, Nahal Zin and Ramat 'Avedat, wadis, photo by Hanna Martiskainen; (E) Central Negev, Makhtesh Ramon, various soil types, https://pixabay.com/photos/israel-desert-judaean-desert-5269086, CC0 (the source photo is erroneously labeled as Judean Desert); (F) 'Arava Valley, north, wadi and reg; (G) 'Arava Valley, south, big reg plain and wadis, photo by Chayan Atman Nataraja; (H) 'Arava Valley, south, sands dunes.

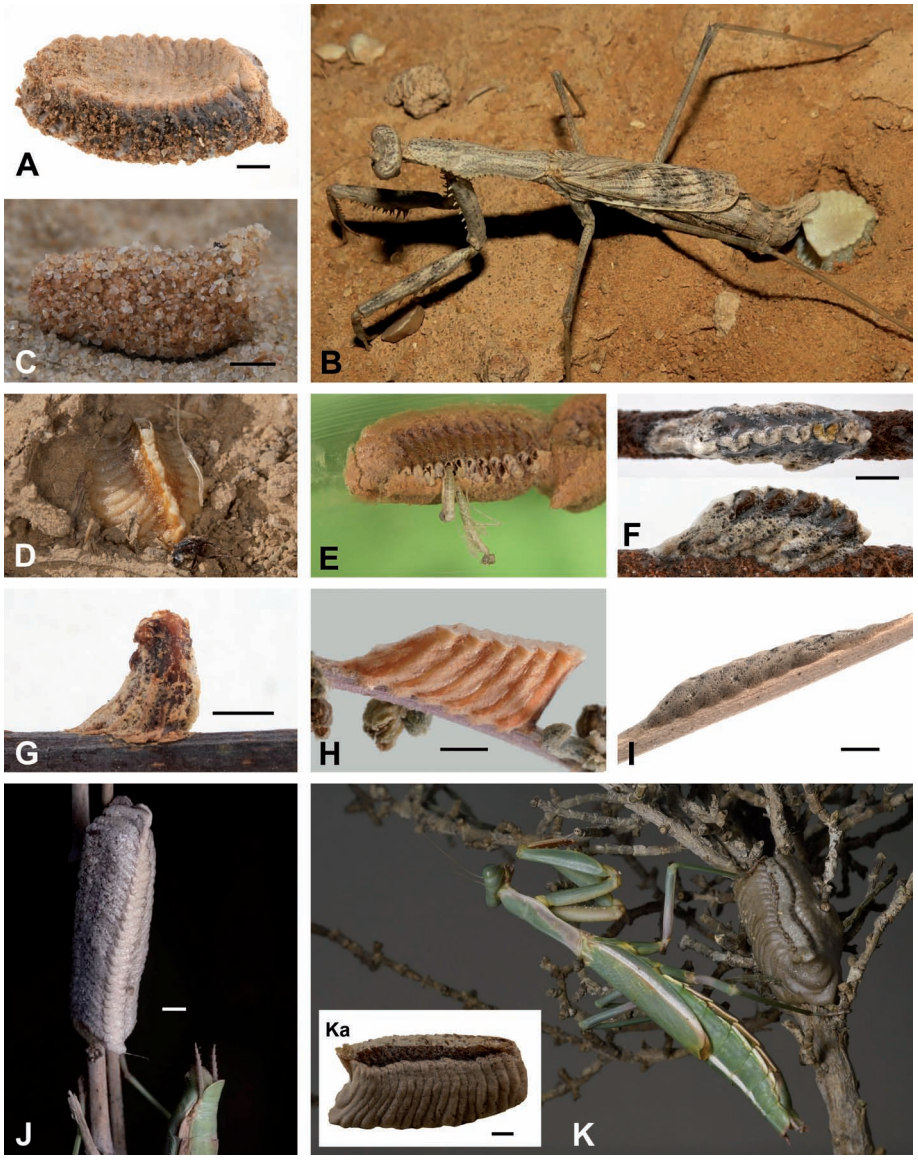


Fig. 68. Oothecae: (A) *Rivetina* sp.; (B) *Rivetina baetica tenuidentata*, oviposition, in situ, photo by Tzoor Magen; (C) *Eremiaphila* sp.; (D) *Ameles heldreichi*, in situ; (E) *Pareuthyphlebs occidentalis*; (F) *Pareuthyphlebs palmoni*, in situ; (G) *Galinthias philbyi*; (H) *Severinia lemoroi*; (I) *Sinaiella nebulosa*; (J) *Iris oratoria*, in situ, photo: Ido Hofshteter Sebbag; (K) *Iris deserti*, in situ, photo by Avi More Yossef, (Ka) *I. deserti*, from captivity; scale bar = 2 mm.

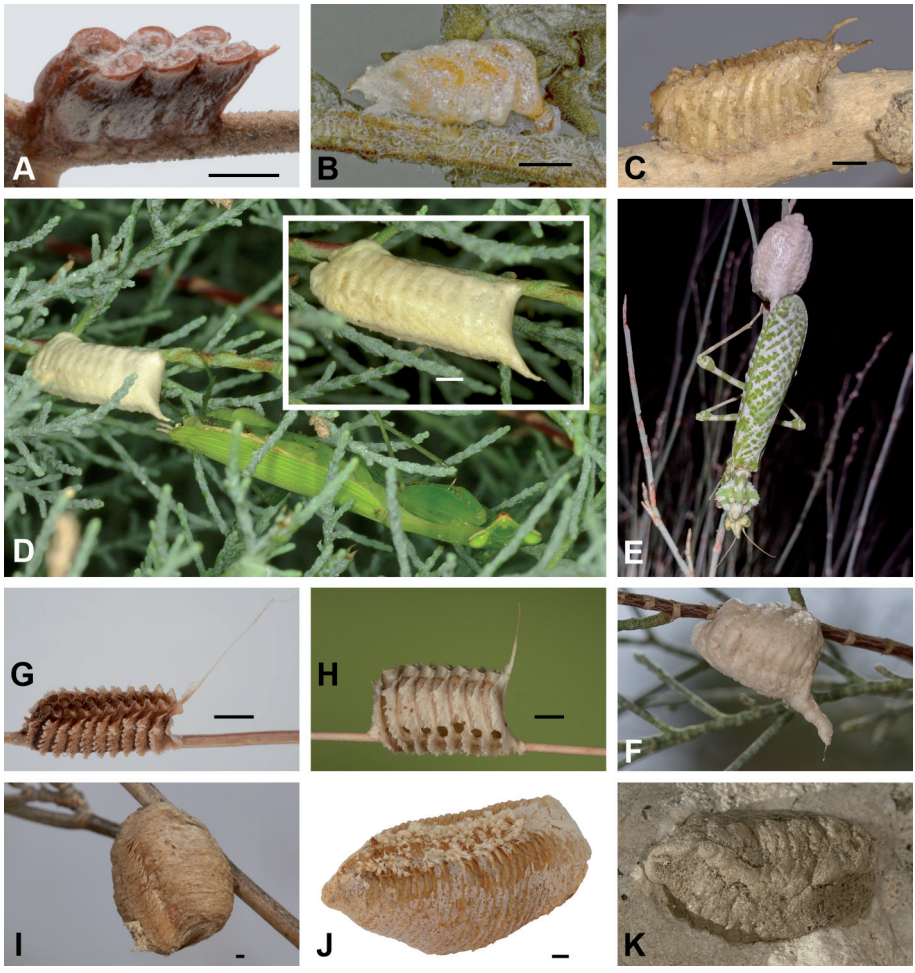


Fig. 69. Oothecae: (A) *Perlamantis alliberti*, in situ; (B) *Holaptilon pusillulum*, photo by Avi More Yossef; (C) *Microthespis dmitriewi*, in situ; (D) *Miomantis paykullii*, in situ; (E) *Blepharopsis mendica*, in situ, photo by Amos Bouskila; (F) *Blepharopsis mendica*; (G) *Empusa fasciata*; (H) *Hypsicorypha gracilis*; (I) *Sphodromantis viridis*; (J) *Mantis religiosa*; (K) *Eremoplana infelix*, in situ; scale bar = 2 mm.

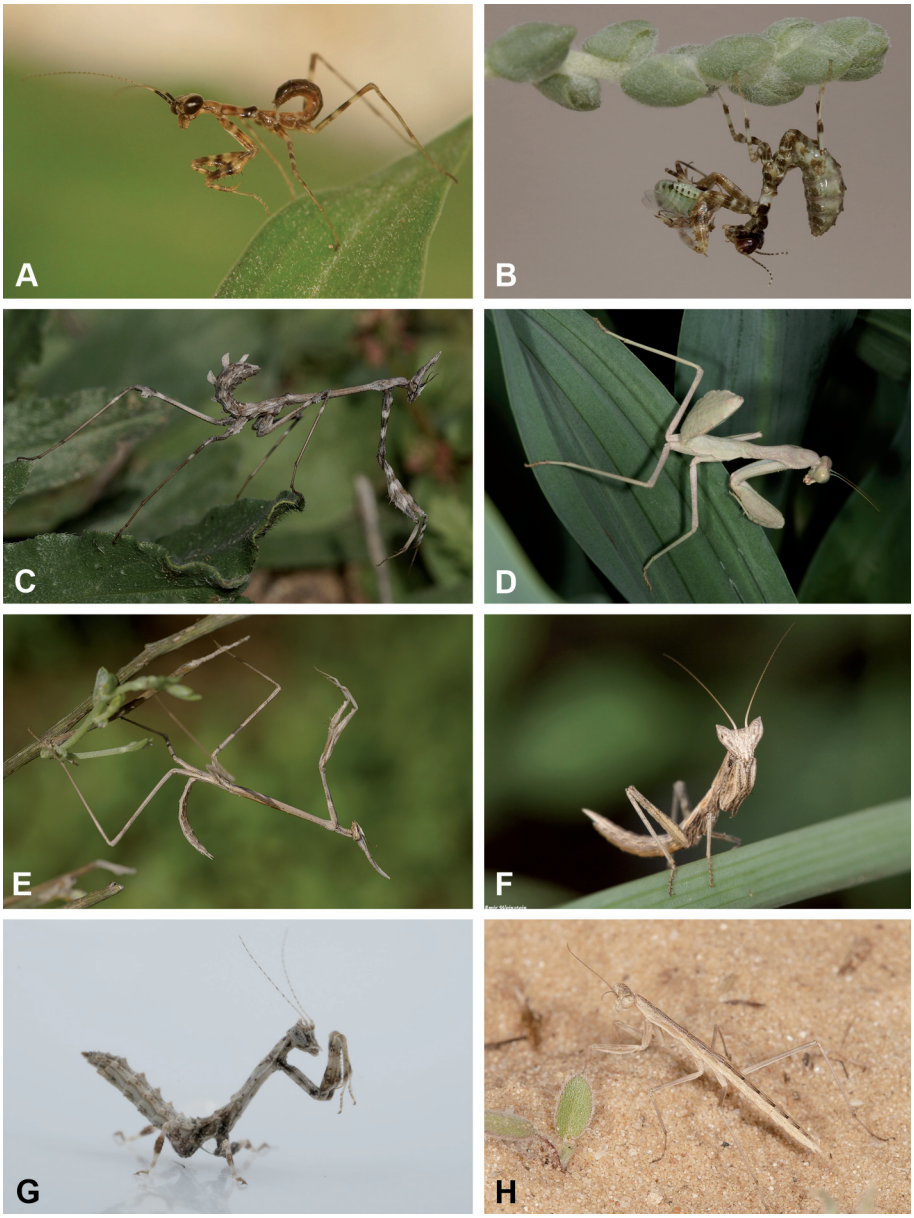


Fig. 70. Nymphs: (A) *Miomantis paykullii*, first instar; (B) *Blepharopsis mendica*, first instar; (C) *Empusa fasciata*; (D) *Sphodromantis viridis*; (E) *Hypsicorypha gracilis*; (F) *Ameles heldreichi*; (G) *Pareuthyphlebs* sp., second instar; (H) *Rivetina byblica*.

Ben-Moshe & Renan 2022). The remnants of the sandy habitats along the coastal plain (Map 2) are under great pressure and degradation from urban development and are declining fast (Achiron-Frumkin *et al.* 2003). About 80% of the sand dune areas that characterized the coastal plain before 1948 have disappeared (Bar 2022). Only about 3% of the Mediterranean region in Israel is currently protected in nature reserves (Gabbay 1997). Mediterranean grasslands and shrublands are subjected to over-grazing and infrastructure development pressure (Ben-Moshe & Renan 2022). Such pressure may also strongly affect the Mantodea fauna, particularly those species that are highly specialized in their habitat preferences and have limited spatial mobility, or are only known from a small, localized geographic range (e.g., *Severinia* spp., *Eremiaphila genei*), or species in which females or both sexes are flightless, such as *Rivetina* spp., *Eremiaphila* spp., *Iris* spp. and others.

This phenomenon is strongly expressed on the Mt Hermon slopes due to the pressure of overgrazing by cattle (Pe'er & Settele 2008). As a result, at the beginning of summer the ground is already highly depleted of grass, which is the typical preferred habitat *of Ameles* and *Rivetina*. During our field trips, most of the *Ameles* and *Rivetina* we observed on Mt Hermon were restricted to the small, scattered patches of grass that remained after the cattle grazing.

Another example of the nature conservation aspect is that of the effect of invasive species on local insect populations. The common myna (*Acridotheres tristis* Linnaeus, 1766) is a foreign species that has become invasive in Israel. The IUCN declared it as one of the three birds on the world's 100 worst invasive species list (Lowe *et al.* 2000).

The common myna is omnivorous and does not hesitate to attack large insects such as grasshoppers and mantids. It forages in small groups which may increase the chances of an individual catching an insect that has escaped from another myna. According to several observations, these birds effectively hunt mantids hiding deep in the vegetation, as observed in the Ashdod sands and in the city of Petah Tiqwa.

Currently, none of the mantodean species in Israel are protected by law unless they are located within a nature reserve or in a protected area. In practice, any conservation efforts regarding Mantodea in Israel should be considered as part of the overall habitat protection and management strategies for sensitive or high-value habitats. This also means considering Mantodea as one of the natural indicators for assessing habitat conditions; as well as raising public awareness of the contributions of seasonal vegetation in open areas (natural, agricultural, urban gardening) to the preservation of species richness, including mantids.

Mantodea in the urban space

Of the 33 Mantid species listed in this study, two can be considered also as "urban": *Sphodromantis viridis* and *Miomantis paykullii*. Both species are highly adaptable, with both sexes able to fly. The females deposit their oothecae on a variety of surfaces, both natural and man-made.

The mantids are attracted to artificial light and surfaces in order to oviposit (Battiston *et al.* 2017). This phenomenon can also be observed on various Facebook photo-documentations from urban areas. While mantids are not exclusive to urban environments, their populations tend to flourish in areas with high anthropogenic impact, such as public gardens, ornamental gardens, home yards, etc. The wide distribution and richness of these species are well-reflected in public records and identification requests from social groups.

Several additional species have also been reported from urban spaces, but these records are sparse and related to the intersection of natural areas with the margins of the urban space and are rarely reported from the core of the cities. These observations and reports present an excellent opportunity to raise public awareness, both of the taxonomic group and of the importance of urban green areas that can support species richness and nature conservation. The presence of these species in the human environment also has the potential to increase the involvement of the public (citizen-science) in ecological studies and in invasive species studies that rely on public records.

Mantodea research – the future

Despite being voracious predators, mantids are not considered significant economic biological control agents. Although research on Mantodea has greatly expanded in recent decades, it still does not receive sufficient funding and attention from research institutions and the number of researchers specializing in mantids is relatively small. According to Google Scholar ('Allintitle:' results, not including citations), there were over 832 entries for Mantodea between 2000–2023, compared to ~27,100 entries for Lepidoptera and ~38,200 entries for Coleoptera. For most of the known mantid species, their natural history is only scarcely known, if at all.

Mantodea, like many other insects, are facing an intense loss of habitats and environmental changes. Some mantid species, even if considered generalists, may nonetheless have specific ecological needs in terms of habitat (Battiston *et al.* 2021). These special ecological needs make them suitable for use as bioindicators of biodiversity and environmental conservation, as well as for studying the impacts of climate change (Battiston *et al.* 2020). Mirzaee *et al.* (2023) demonstrated how mantids (*Nilomantis floweri* Werner, 1907) can be used as a model for evaluating the relationship between organism distribution and arid climate; and Hurd (1999) noted that mantids, as terrestrial predators, constitute excellent candidates for experimental ecology research.

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REFERENCES

Abu-Dannoun, O.M. 2006. *A taxonomic study on the Mantodea of Jordan*. PhD dissertation. University of Jordan, Amman.

Achiron-Frumkin, T., Frumkin, R., Rudich, R., Maloul, A., Levin, N. & Papai, N. 2003. *Conservation of the sands of the coastal plain.* Ministry of the Environment, SPNI, NRPA, JNF, HS, JIIS, Jerusalem. [in Hebrew]

Adair, E.W. 1913. Nôtes preliminaires pour servir à l’étude des Mantidae. *Bulletin de la Société entomologique de d’Égypte* **1**: 21–37.
https://archive.org/details/bulletindelasoci3191213jami

Adair, E.W. 1922. Notes sur *Eremoplana infelix* Uv. (= *E. armata* Sauss., nec de Haan) et *Idolomorpha gracilis* Burm., Mantidae nouvelles pour l’Egypte (Orthop.). *Bulletin de la Société royale entomologique d’Egypte* **7**: 40–44.
https://www.biodiversitylibrary.org/item/40035#page/194

AGABITI, B., IPPOLITO, S. & LOMBARDO, F. 2010. The Mediterranean species of the genus *Ameles* Burmeister, 1838 (Insecta, Mantodea: Amelinae): with a biogeographic and phylogenetic evaluation. *Boletín de la Sociedad Entomológica Aragonesa* **47**: 1–20. http://sea-entomologia.org/Publicaciones/PDF/BOLN_47/001020BSEA47COMPLETO.pdf

AHL [THE ACADEMY OF THE HEBREW LANGUAGE]. 2024. *The list of the Hebrew vernacular names of the Mantodea of Israel*. Jerusalem. [in Hebrew]. https://hebrew-academy.org.il/%D7%A9%D7%9E%D7%95%D7%AA-%D7%97%D7%93%D7%A9%D7%99%D7%9D-%D7%9C%D7%92%D7%9E%D7%9C%D7%99-%D7%A9%D7%9C%D7%9E%D7%94/ (accessed 31 December 2024)

AMITAI, P. & SIMON, D. 1985. *Life beneath the rocks. A microworld bounded by unending dusk and sky of stone*. Am Oved Publisher Ltd, Tel Aviv, 134 pp. [in Hebrew]

ARMOZA-ZVULONI, R., SHLOMI, Y., SHEM-TOV, R., STAVI, I. & ABADI, I. 2021. Drought and anthropogenic effects on Acacia populations: A case study from the hyper-arid southern Israel. *Soil Systems* **5** (2): Art. 23. https://doi.org/10.3390/soilsystems5020023

AUDOUIN, J.V. 1826. *Explication sommaire des planches dont les dessins ont été fournis par M. J. C. Savigny. Pour l'histoire naturelle de l'ouvrage*. Vol. 1, part 4. *In*: Jomard, E.F. (Ed.), *Description de l'Égypte, ou, Recueil de observations et des recherches qui ont été faites en Égypte pendant l'expédition de l'armée française*. Imprimierie impériale, Paris, pp. 1–318. https://www.biodiversitylibrary.org/item/128879#page/9/mode/1up

BAR, P. 2022. *Geo-ecology of dunes at the coastal plain of Israel*. Publisher D. Pery, 230 pp. [in Hebrew]

BARASH, A. 1937. Green mantid *Sphodromantis viridis* Forskål. *Ha-Teva Ve-Haaretz* **5**: 375–383. [in Hebrew]

BARASH, A. 1938. Green mantid *Sphodromantis viridis* Forskål. *Ha-Teva Ve-Haaretz* **5**: 529–539. [in Hebrew]

BARASH, A. 1939. The reproduction of the green mantid *Sphodromantis viridis* Forskål. *Ha-Teva Ve-Haaretz* **6**: 100–104, 237–246, 395–405. [in Hebrew]

BATTISTON, R. & FONTANA, P. 2005. Contribution to the knowledge of the genus *Ameles* (Burmeister, 1838) with the description of a new species from Jordan (Insecta Mantodea). *Atti dell' Accademia Roveretana degli Agiati*, a 255, Ser. VIII **5** (B): 193–197. https://media.agiati.org/page/attachments/agiati-atti-b-2005-art-07-battiston.pdf

BATTISTON, R., ANDRIA, S. & RUZZANTE, G. 2017. The silent spreading of a giant mantis: a critical update on the distribution of *Sphodromantis viridis* (Forskål, 1775) in the Mediterranean islands (Mantodea: Mantidae). *Onychium* **13**: 25–30. https://doi.org/10.5281/zenodo.546318

BATTISTON, R., CASTIGLIONE, E., DI PIETRO, W., LAZZARETTI, S., MANTI, F. & SCIBERRAS, A. 2021. A social beauty: distribution, ecology and conservation of *Iris oratoria* in the Central Mediterranean Region. *Fragmenta entomologica* **53** (2): 413–418. https://doi.org/10.13133/2284-4880/522

BATTISTON, R., CORREAS, J., LOMBARDO, F., MOUNA, M., PAYNE, K. & SCHÜTTE, K. 2018. Morphological convergences in *Ameles* Burmeister and *Pseudoyersinia* Kirby: Taxonomic implications of wing reduction and flight predisposition in some West-Mediterranean Amelini (Insecta: Mantodea). *Zootaxa* **4377** (1): 21–38. https://doi.org/10.11646/zootaxa.4377.1.2

BATTISTON, R., DI PIETRO, W., AMERINI, R. & SCIBERRAS, A. 2020. The praying mantids (Insecta: Mantodea) as indicators for biodiversity and environmental conservation: a case study from the Maltese and Balearic archipelagos. *Biodiversity* **21** (3): 142–149. https://doi.org/10.1080/14888386.2020.1848623

BATTISTON, R., DI PIETRO, W. & ANDERSON, K. 2022. The pet mantis market: a first overview on the praying mantis international trade (Insecta, Mantodea). *Journal of Orthoptera Research* **31** (1): 63–68. https://doi.org/10.3897/jor.31.71458

BATTISTON, R., LEANDRI, F., DI PIETRO, W. & ANDRIA, S. 2018. The Giant Asian Mantis *Hierodula tenuidentata* Saussure, 1869 spreads in Italy: a new invasive alien species for the European fauna? (Insecta Mantodea). *Biodiversity* **9** (4): 399–404. https://doi.org/10.31396/Biodiv.Jour.2018.9.4.399.404

Battiston, R., Picciau, L., Fontana, P. & Marshall, J. 2010. *Mantids of the Euro-Mediterranean area*. WBA Handbooks 2. World Biodiversity Association, Verona, Italy, 239 pp.

Battiston, R., Puttaswamaiah, R. & Manjunath, N. 2018. The fishing mantid: predation on fish as a new adaptive strategy for praying mantids (Insecta: Mantodea). *Journal of Orthoptera Research* **27** (2): 155–158. https://doi.org/10.3897/jor.27.28067

Beier, M. 1964. Ein neues mantiden-genus aus Israel. *Israel Journal of Zoology* **13** (4): 184**–**186. https://doi.org/10.1080/00212210.1964.10688200

Beier, M. 1968. Mantodea (Fangheuschrecken). *In*: Helmcke, J.-G., Starck, D. & Wermuth, H. (Eds), *Handbuch der Zoologie*. Walter de Gruyter, Berlin, pp. 1–47.

BenDavid-Novak, H. & Schick, A.P. 1997. The response of Acacia tree populations on small alluvial fans to changes in the hydrological regime: Southern Negev Desert, Israel. *Catena* **29** (3–4): 341**–**351. https://doi.org/10.1016/S0341-8162(96)00066-5

Ben-Moshe, N. & Renan, I. 2022. *State of nature report – trends and threats*. Hamaarag – Israel's National Ecosystem; Assessment Program, Steinhardt Museum of Natural History, Tel Aviv University, Tel Aviv, Israel, 121 pp. [in Hebrew, with English abstract]

Ben-Natan, G. 2013. *The salt marshes of Israel – extreme and unique living environment*. Information booklet and recommendations to policy makers, planners, field managers and educators. The Society for the Protection of Nature in Israel. [in Hebrew] https://tevabiz.org.il/wp-content/uploads/2018/01/Salt_Marshes_Israel_SPNI2013_SnglPage-1.pdf

Blondheim, S. 1989. Mantodea. *In*: Kugler, J. (Ed.), *Plants and Animals of the Land of Israel: An Illustrated Encyclopedia*. Vol. 3. Insects. Israel: Ministry of Defence and the Society for Protection of Nature, Israel, pp. 64-67. [in Hebrew]

Bodenheimer, F.S. 1925. An introduction to knowledge of the Orthoptera of the Land of Israel. *In*: Zifroni, A., Rabinovitz, A.S. & Shimonovitch, D. (Eds), *The Yearbook of the Land of Israel, Years 2–3***.** Hebrew Writers Association & Dvir Publishing House, pp. 53**–**71. [in Hebrew]

Bodenheimer, F.S. 1933*a*. Eine neue *Eremiaphila*-Art, (Orthoptera-Mantodea). *Mitteilungen aus der Entomologischen Gesellschaft* **4**: 79-80.

Bodenheimer, F.S. 1933*b*. Palestine, great natural laboratory of the east. *Science* **78** (2030): 477**–**479.

Bodenheimer, F.S. 1935*a*. *Animal life in Palestine*. An introduction to the problem of animal ecology and zoogeography. L. Mayer, Jerusalem, Israel. 506 pp.

Bodenheimer, F.S. 1935*b*. Ökologisch-zoogeographische untersuchungen über die Orthopterenfauna Palästinas. 1. Teil. *Archiv Für Naturgeschichte* (Neue Folge) **4**: 88**–**142. https://archive.org/details/in.ernet.dli.2015.7032/page/n93

Bodenheimer, F.S. 1935*c*. Ökologisch-zoogeographische untersuchungen über die Orthopterenfauna Palästinas. 2. Teil.. *Archiv Für Naturgeschichte* (Neue Folge) **4**: 145–216. https://archive.org/details/in.ernet.dli.2015.7032/page/n151

Bodenheimer, F.S. 1937. Prodromus Faunae Palestinae. *Mémoires a l'Institut d'Égypte* **33**: 221**–**222. https://archive.org/details/MIE_33/mode/2up

Bolívar, I. 1893. Liste des Orthoptères recueillis en Syrie par le Dr Théod. Barrois. *Revue biologique du nord de la France* **5**: 476**–**489. https://www.biodiversitylibrary.org/item/41751#page/486

Bolívar, I. 1911. Description de cinq espèces nouvelles d'Orthoptères. (quatre trouvées par M. Henri Gadeau de Kerville en Syrie, et une provenant de Perse). *Bulletin de la Société des Amis des Sciences Naturelles de Rouen* **47**: 31–38. https://www.biodiversitylibrary.org/item/257340#page/40/mode/1up

Brackenbury, J. 1999. Flight and wing kinematics. *In*: Prete, F.R., Wells, H., Wells, P.H. & Hurd, L.E. (Eds), *The praying mantids*. Johns Hopkins University Press, Baltimore, pp. 183**–**193.

Bragg, P.E. 1997. *An introduction to rearing praying mantids*. P.E. Bragg, Ilkeston, Derbyshire, UK. 16 pp. https://www.researchgate.net/profile/Philip-Bragg-2/publication/349042197

Brannoch, S.K., Wieland, F., Rivera, J., Klass, K.D., Béthoux, O. & Svenson, G.J. 2017. Manual of praying mantis morphology, nomenclature and practices (Insecta, Mantodea). *ZooKeys* **696**: 1**–**100. https://doi.org/10.3897/zookeys.696.12542

Bruins, H. & Sherzer, Z. & Ginat, H. & Batarseh, S. 2012. Degradation of springs in the 'Arava Valley: anthropogenic and climatic factors. *Land Degradation and Development* **23**: 365–383. https://doi.org/10.1002/ldr.2149

Brullé, A. 1832. *Expédition scientifique de Morée. Section des Sciences Physiques. 1.re partie. Zoologie. Deuxième section - Des animaux articulés.* F. G. Levrault, Paris, 400 pp.
https://mbd-db.osu.edu/hol/publications/a4e38fbf-b5d9-46ce-92cb-885eeeb40a7e?&search_type=fast

Brunner von Wattenwyl, C. 1882. *Prodromus der Europäischen Orthopteren*. *Monografien Entomologie Orthoptera*. Verlag von Wilhelm Engelmann, Leipzig, 466 p.
https://archive.org/details/bub_gb_szZDAAAAYAAJ_2/mode/2up

Burmeister, H. C. 1838. *Handbuch der Entomologie*. G. Reimer, Berlin, 552 pp.
https://www.biodiversitylibrary.org/item/82123#page/6/mode/1up

Buxton, P.A. 1924. Heat, moisture and animal life in deserts. *Proceedings of the Royal Society of London, Series B* **96** (673): 123–131.
https://www.jstor.org/stable/81063

Buxton, P.A. & Uvarov, B.P. 1923. A contribution to our knowledge of Orthoptera of Palestine. *Bulletin Royal Entomological Society Egypte* **7**: 167–214.
https://www.biodiversitylibrary.org/item/40035#page/321

Caesar, M., Roy, R., Legendre, F., Grandcolas, P. & Pellens, R. 2015. Catalogue of dictyoptera from Syria and neighbouring countries (Lebanon, Turkey, Iraq and Jordan). *Zootaxa* **3948** (1): 71–92.
https://doi.org/10.11646/zootaxa.3948.1.5

Chopard, L. 1921. Report on the Orthoptera of Mesopotamia and Persia collected by Messrs. P.A. Buxton, MA and WE Evans, B. Sc. Dyctioptera and Ensifera. *The Journal of the Bombay Natural History Society* **27** (4): 759–771.
https://www.biodiversitylibrary.org/item/95740#page/851/mode/1up

Chopard, L. 1938. Les Orthoptères desertiques de l'Afrique du Nord. *Mémoires de la société de biogéographie* **6**: 219–230.

Chopard, L. 1943. *Orthoptéroïdes de l'Afrique du Nord*. Faune de l'empire français. Larose, Paris, France. 450 pp.

Cianferoni, F., Mochi, O. & Ceccolini, F. 2018. New records of *Hierodula* Burmeister, 1838 (Mantodea: Mantidae) in Europe. *Revista gaditana de Entomología* **9** (1): 299–308.
https://www.researchgate.net/publication/328872883

Danin, A. 1992. Flora and vegetation of Israel and adjacent areas. *Bocconea* **3**: 18–42.
https://flora.org.il/wp-content/themes/flora/includes/dl.php?id=1918602 (accessed 31. xii. 2024).

Danin, A. & Plitmann, U. 1987. Revision of the plant geographical territories of Israel and Sinai. *Plant Systematics and Evolution* **156**: 43–53.

Ehrmann, R. 1996. Die Mantodea-Fauna von Ägypten. *Entomologische Zeitschrift* **106** (10): 410–424.

Ehrmann, R. 2002. *Mantodea: Gottesanbeterinnen der Welt*. Natur und Tier-Verlag, Münster, Germany. 519 pp.

Ehrmann, R. 2011. Mantodea from Turkey and Cyprus. *Articulata - Zeitschrift der Deutschen Gesellschaft für Orthopterologie e.V. DGfO* **26**: 1–42.
https://www.zobodat.at/pdf/Articulata_26_2011_0001-0042.pdf

Enan, R., Gadallah, S., Okely, M. & Nasser, M. 2017. Historical review of Mantodea occurrence in Egypt with notes about *Eremiaphila* spp. in the Middle East and North Africa. *European Journal of Zoological Research* **5**: 25–33.
https://www.researchgate.net/profile/Mohamed-Nasser/publication/322923891

Fabricius, J.C. 1775. *Systema Entomologiae, sistens Insectorum Classes, Ordines, Genera, Species, adjectis Sysnonymis, Locis, Descriptionibus, Observationibus*. Kortii, Flensburgi et Lipsiae. 832 pp.
https://www.biodiversitylibrary.org/page/25551417

Facebook. 2024*a*. *The Israeli Group of Arthropods, Reptiles and Amphibian photography, public group*.
https://www.facebook.com/groups/bugsphoto (accessed 31.xii.2024)

Facebook. 2024*b*. *The Mantodea of Israel in Facebook, public group*.
https://www.facebook.com/groups/357757764739699 (accessed 31.xii.2024)

Filser, J. & Prasse, R. 2008. A glance on the fauna of Nizzana. Chapter 9. *In*: Breckle, S.W., Yair, A. & Veste, M. (Eds), *Arid dune ecosystems: the Nizzana sands in the Negev desert*. Vol. 200. Springer Berlin, Heidelberg, pp. 125–147.
https://doi.org/10.1007/978-3-540-75498-5

Finot, M.A. 1893. Quatre especes nouvelles d'Orthoptères habitant l'Algérie. *Bulletin de la Société entomologique de France* **62**: 28–30. https://gallica.bnf.fr/ark:/12148/bpt6k5551265x/f32.item

Forskål P. 1775. *Descriptiones Animalium, Avium, Amphibiorum, Piscium, Insectorum, Vermium; quae in Itinere Orientali Observavit Petrus Forskål. Post Mortem Auctoris editit Carsten Niebuhr. Adjuncta est materia Medica Kahirina*. Mölleri, Hafniae, 19 + xxxiv + 164 pp. https://www.biodiversitylibrary.org/page/2088059

Fraisl, D., Hager, G., Bedessem, B., Gold, M., Hsing, P.Y., Danielsen, F., Hitchcock, C.B., Hulbert, J.M., Piera, J., Spiers, H., Thiel, M. & Haklay, M. 2022. Citizen science in environmental and ecological sciences. *Nature Reviews Methods Primers* **2** (1): Art. 64. https://doi.org/10.1038/s43586-022-00144-4

François, A. 2012. *Hypsicorypha gracilis* (Burmeister, 1838), confirmation de la présence de l'espèce au Maroc (Dictyoptera, Mantodea, Empusidae). *Bulletin de la Société entomologique de France* **117** (4): 445–448. https://doi.org/10.3406/bsef.2012.3069

Furth, D.G. 1975. Israel, a great biogeographic crossroads. *Discovery* **111**: 2–13.

Gabbay, S. 1997. *Conservation and sustainable use of biological diversity in Israel. Report of the State of Israel on the Implementation of Article 6 of the Convention on Biological Diversity*. State of Israel, Ministry of the Environment. https://www.science.co.il/biomedical/reports/Biological-Diversity-Israel-1997.pdf

Galil, J. 1972. The origin of the Sudanian vegetation in Israel. *Teva' va'Arets* **14** (4): 139–145. [in Hebrew]

Giglio-Tos, E. 1893. Viaggio del D.r E. Festa in Palestina, nel Libano e regione vicine. V. Ortotteri, *Bolletino del musei di zoologia ed anatomia comparata della R. Università di Torino* **8** (164): 3–4. https://www.biodiversitylibrary.org/item/42761#page/263

Giglio-Tos, E. 1915. Mantidi esotici. Generi e specie nuove. *Bollettino della Società entomologica italiana* **46**: 134–200. https://www.biodiversitylibrary.org/page/10449391#page/158

Giglio-Tos, E. 1927. *Orthoptera Mantidae*. Das Tiereich Walter de Gruyter & Co., Berlin. 707 pp.

Gomboc, S. 2000. Bionomie, Verbreitung und Züchtungsversuche an *Empusa fasciata* Brullé, 1836 (Mantodea, Empusidae) in Slowenien. *Articulata - Zeitschrift der Deutschen Gesellschaft für Orthopterologie e.V. DGfO* **15** (1): 1–6. https://www.zobodat.at/pdf/Articulata_15_2000_0001-0006.pdf

Google. 2023. [*Israel satellite map*]. https://goo.gl/maps/EoVaCv9TZ3KdRaJr9 (accessed 20.vi.2023).

Govorov, V. 2019. First record of the courtship behaviour of *Eremiaphila* sp. (Insecta: Mantodea: Eremiaphilidae), from Israel. *Boletín de la Sociedad Entomológica Aragonesa* **65**: 287–289. https://www.researchgate.net/publication/373144691

Greenfield, M.D. & Pener, M.P. 1989. In Memoriam. Syril A. Blondheim (1926–1989). *Israel Journal of Ecology and Evolution* **36** (3–4): 177–179. https://doi.org/10.1080/00212210.1989.10688634

Guérin-Méneville, F.E. 1843. Description d'un nouveau genre d'Orthoptères, de la famille des Mantides, découvert par M. Allibert dans le midi de la France. *Revue zoologique* **6**: 41–42. https://www.biodiversitylibrary.org/item/19446#page/49

Haim, A., Rubal, A. & Harari, J. 2019. Thermoregulatory "strategies" of two *Apodemus* species inhabiting a cold environment on Mount Hermon. *In*: Carey, C., Florant, G.L., Wunder, B.A. & Horwitz, B. (Eds), *Life in the cold, ecological, physiological, and molecular mechanisms*. Boca Raton, CRC Press, pp. 91–97. https://www.taylorfrancis.com/chapters/edit/10.1201/9780429040931-9

Handal, E., Wahsh, A., Ehrmann, R., Amr, Z., Battiston, R. & Qumsiyeh, M. 2018. Mantids (Dictyoptera: Mantodea) from the Palestinian Territories with an updated list. *Articulata - Zeitschrift der Deutschen Gesellschaft für Orthopterologie e.V. DGfO* **33**: 91–105. https://www.researchgate.net/publication/330384943

Harpaz, I. 1960. Prof. F.S. Bodenheimer. *Zeitschrift für Angewandte Entomologie* **46** (2): 228–231. https://doi.org/10.1111/j.1439-0418.1960.tb01375.x

Hill, S.A. 2007. Sound generation in *Mantis religiosa* (Mantodea: Mantidae): stridulatory structures and acoustic signal. *Journal of Orthoptera Research* **16** (1): 35–49. https://doi.org/10.1665/1082-6467(2007)16%5b35:SGIMRM%5d2.0.CO;2

Hurd, I.E. 1999. Ecology of Praying Mantids. *In*: Prete, F.R., Wells, H., Wells, P.H. & Hurd, L.E. (Eds), *The praying mantids*. Johns Hopkins University Press, Baltimore, pp. 43–49.

Hurd, L.E., Prete, F.R., Jones, T.H., Singh, T.B., Co, J.E. & Portman, R.T. 2004. First identification of a putative sex pheromone in a praying mantid. *Journal of Chemical Ecology* **30**: 155–166. https://doi.org/10.1023/B:JOEC.0000013188.79411.18

ICZN [International Commission on Zoological Nomenclature]. 1987. Opinion 1461. A ruling on the authorship and dates of the text volumes of the Histoire naturelle section of Savigny's Description de l'Egypte. *Bulletin of Zoological Nomenclature* **44** (3): 219–220. https://www.biodiversitylibrary.org/page/12229586#page/243

ICZN [International Commission on Zoological Nomenclature]. 1999. *International Code of Zoological Nomenclature*. 4th ed. The International Trust for Zoological Nomenclature, London. https://code.iczn.org (accessed 31.xii.2024).

iNaturalist. 2024. *Mantodea*. Available from https://www.inaturalist.org (accessed on 31.xii.2024).

Inoue, T. & Matsura, T. 1983. Foraging strategy of a mantid, *Paratenodera angustipennis* S.: Mechanisms of switching tactics between ambush and active search. *Oecologia* **56**: 264–271. https://doi.org/10.1007/BF00379700

Ionescu, A. & Eyer, P.-A. 2016. Notes on *Cataglyphis* Foerster, 1850 of the bicolor species-group in Israel, with description of a new species (Hymenoptera: Formicidae). *Israel Journal of Entomology* **46**: 109–131. http://doi.org/10.5281/zenodo.221456

IUCN. 2025. *The IUCN list of threatened species*. https://www.iucnredlist.org (accessed 1.xii.2025)

Kaltenbach, A. 1963. Kritische Untersuchungen zur Systematik, Biologie und Verbreitung der europäischen Fangheuschrecken (Dictyoptera-Mantidae). *Zoologische Jahrbücher Abteilung für Systematik* **90**: 521–598.

Kaltenbach, A. 1982. Insects of Saudi Arabia. Mantodea. *Fauna of Saudi Arabia* **4**: 29–72.

Kaltenbach, A. 1984. Insects of Saudi Arabia. New species and further records of Mantodea from Saudi Arabia and Oman. *Fauna of Saudi Arabia* **6**: 203–209.

Kaltenbach, A. 1991. A further contribution to the knowledge of the Mantodea of the Arabian Peninsula. *Fauna of Saudi Arabia* **12**: 246–255.

Kaltenbach, A. 1996. Unterlagen für eine Monographie der Mantodea des südlichen Afrika: 1. Artenbestand, geographische Verbreitung und Ausbreitungsgrenzen (Insecta: Mantodea). *Annalen des Naturhistorischen Museums in Wien* **98**: 193–346. https://www.zobodat.at/pdf/ANNA_98B_0193-0346.pdf

Karl, K. 1999. Binocular vision and distance estimation. *In*: Prete, F.R., Wells, H., Wells, P.H. & Hurd, L.E. (Eds), *The praying mantids*. Johns Hopkins University Press, Baltimore, pp. 114–140.

Karsakoff, M. 1935*a*. Le rôle du coloris des ailes de *Iris deserti* dans le rapprochement des sexes. *Publications de la Société Linnéenne de Lyon* **4** (9): 144. https://www.persee.fr/doc/linly_0366-1326_1935_num_4_9_9087

Karsakoff, M. 1935*b*. Quelques observations sur une nouvelle Mante du Sud-Algérien *Iris deserti* Uv. *Publications de la Société Linnéenne de Lyon* **78** (1): 161–170. https://www.persee.fr/doc/linly_1160-6401_1935_num_78_1_14760

Kolnegari, M. 2020. Mating behavior of the Persian boxer mantid, (Mantodea: Mantidae). *Journal of Orthoptera Research* **29** (1): 25–40. https://doi.org/10.3897/jor.29.37595

Kolnegari, M. & Vafaei, R. 2018. A new species of *Holaptilon* Beier, 1964 from Haftad-gholeh (sic!) Protected Area, Iran (Mantodea, Mantidae, Amelinae). *IAU Entomological Research Journal* **10** (2): 150–158. https://www.researchgate.net/publication/329528254

Kolnegari, M., Schwarz, C.J., Ghrejyan, T. & Borer, M. 2025. *Sinaiella azadi* sp. nov. (Mantodea: Toxoderidae); a new praying mantis species from Western Asia (Iran and Armenia). *Zootaxa* **5594** (1): 98–110. https://doi.org/10.11646/zootaxa.5594.1.4

Krauss, H.A. 1902. Diagnosen neuer Orthopteren aus Sudarabien und von der Insel Sokotra. *Anzeiger der Kaiserlichen Akademie der Wissenschaften, Mathematisch-naturwissenschaftliche Classe (Wien)* 39: 53-58. https://www.biodiversitylibrary.org/item/30046#page/90

Krauss, H.A. 1909. Dermaptera und Orthoptera aus Ägypten, der Halbinsel Sinai, Palästina und Syrien. *In*: Kneucher, A. (Ed.), Zoologische Ergebnisse zweier in den Jahren 1902 und 1904 durch die Sinai-halbinsel botanischen Studiereisen. *Verhandlungen des Naturwissenschaftlichen Vereins in Karlsruhe* **21**: 36–43.

Kravchenko, V.D., Fibiger, M., Mooser, J. & Muller, G.C. 2006. The Noctuinae of Israel (Lepidoptera: Noctuidae). *SHILAP Revista de lepidopterología* **34** (136): 353–370. https://www.redalyc.org/pdf/455/45513605.pdf

Kugler, J. 1988. The zoogeography of social insects of Israel and Sinai. *In*: Yom-Tov, Y. & Tchernov, E. (Eds), *The zoogeography of Israel*. Dr. W. Junk, Dordrecht, pp. 251–275.

La Greca, M. & Lombardo, F. 1982. Le specie mediterranee e dell'Asia occidentale del gen. *Rivetina* Berl. e Chop. (Insecta, Mantodea). *Animalia: Periodico dell 'Istituto di Biologia Animale* **9** (1–3): 345–393.

La Greca, M. & Lombardo, F. 1983. Due nuove specie di *Pareuthyphlebs* Werner dell'Arabia (Insecta, Mantodea). *Animalia: Periodico dell 'Istituto di Biologia Animale* **10** (1–3): 149–158.

Lefebvre, M.A. 1835. Nouveau groupe d'orthoptères de la famille des Mantides. *Annales de la Société entomologique de France* **4**: 449–508. https://archive.org/details/annalesdelasoci41835soci/page/448

Linnaeus, C. 1758. *Systema Naturae per regna tria naturae, secundum classes, ordines, genera, species, cum characteribus, differentiis, synonymis, locis*. Impensis Direct. Laurentii Salvii. Holmiae, 824 p. https://biodiversitylibrary.org/page/726886

Liske, E., Köchy, K. & Wolff, H.-G. 1999. Ethology of defenses against predators. *In*: Prete, F.R., Wells, H., Wells, P.H. & Hurd, L.E. (Eds), *The praying mantids*. Johns Hopkins University Press, Baltimore, pp. 276–299.

Lowe S., Browne M., Boudjelas S. & De Poorter M. 2000. *100 of the World's Worst Invasive Alien Species, a selection from the Global Invasive Species Database*. The Invasive Species Specialist Group, Auckland, 12 pp. https://web.archive.org/web/20170316112205if_/http://issg.org/database/species/reference_files/100English.pdf

Lulav, S. 1972. Yaacov Palmoni. *Israel Journal of Zoology* **21** (1): 55–61. https://doi.org/10.1080/00212210.1972.10688348

Ma, Y., Zhang, L.P., Lin, Y.J., Yu, D.N., Storey, K.B. & Zhang, J.Y. 2023. Phylogenetic relationships and divergence dating of Mantodea using mitochondrial phylogenomics. *Systematic Entomology* **48** (4): 644–657. https://doi.org/10.1111/syen.12596

Marabuto, E. 2014. The Afrotropical *Miomantis caffra* Saussure 1871 and *M. paykullii* Stal 1871: first records of alien mantid species in Portugal and Europe, with an updated checklist of Mantodea in Portugal (Insecta: Mantodea). *Biodiversity Data Journal* **2**: e4117. https://doi.org/10.3897/BDJ.2.e4117

Marabuto, E., Rodrigues, I. & Henriques, S. 2014. *Sphodromantis viridis* (Forskål, 1775): New for Portugal and new records of the rare and small mantids *Apteromantis aptera* (Fuente, 1894) and *Perlamantis allibertii* Guérin-Méneville, 1843 in the country (Mantodea: Mantidae and Amorphoscelidae). *Biodiversity data journal* **2**: e1037. https://doi.org/10.3897/BDJ.2.e1037

Maxwell R.M. 1999. Mating behavior. *In*: Prete, F.R., Wells, H., Wells, P.H. & Hurd, L.E. (Eds), *The praying mantids*. Johns Hopkins University Press, Baltimore, pp. 69–89.

Mirzaee, Z., Lotfalizadeh, H. & Sadeghi, S. 2022. Chalcidoid parasitoids (Hymenoptera: Torymidae and Eupelmidae) of mantids (Mantodea) oothecae in Iran. *Phytoparasitica* **50**: 487–499. https://doi.org/10.1007/s12600-021-00965-1

Mirzaee, Z., Sadeghi, S., Ballarin, F., Schmitt, T., Simões, M. & Wiemers, M. 2023. Life history and biogeography of the enigmatic mantid *Nilomantis floweri* (Mantodea, Nanomantidae). *ZooKeys* **1173**: 275–295. https://doi.org/10.3897/zookeys.1173.107204

Mirzaee, Z., Battiston, R., Ballarin, F., Sadeghi, S., Simões, M., Wiemers, M. & Schmitt, T. 2024. The Six Dwarfs of the Middle East: revision of the enigmatic praying mantis genus *Holaptilon* (Mantodea: Gonypetidae: Gonypetinae) with the description of four new species under integrative taxonomy. *Arthropod Systematics & Phylogeny* **82**: 89–117. https://doi.org/10.3897/asp.82.e112834

Mirzaee, Z., Simões, M.V.P., Battiston, R., Sadeghi, S., Wiemers, M., & Schmitt, T. 2024. Biology, ecology and biogeography of eremic praying mantis *Blepharopsis mendica* (Insecta: Mantodea). *PeerJ* **12**:e16814. http://doi.org/10.7717/peerj.16814

Mohammad, S.K., Alla, S. M.G., El-Hamouly, H., Ehrmann, R. & El-Den Nasser, M.G. 2011. Mantodea of Egypt. *Zootaxa* **3044** (1): 1–27. https://doi.org/10.11646/zootaxa.3044.1.1

Morales Agacino, E. 1947. Mántidos de la fauna ibérica. *Boletín de patología vegetal y entomología agrícola* **15**: 131–164.

Moulin, N. 2020. When Citizen Science highlights alien invasive species in France: the case of Indochina mantis, *Hierodula patellifera* (Insecta, Mantodea, Mantidae). *Biodiversity Data Journal* **8**: e46989. https://doi.org/10.3897/BDJ.8.e46989

Müller, G.C., Kravchenko, V.D., Li, C., Mooser, J., Orlova, O.B., Phillips, A., Speidel, W. & T. Witt. 2005. The Notodontidae (Lepidoptera) of Israel. *Atalanta* **36** (1/2): 237–247. https://www.researchgate.net/publication/266474906

Nyffeler, M., Maxwell, M.R. & Remsen Jr, J.V. 2017. Bird predation by praying mantises: a global perspective. *The Wilson Journal of Ornithology* **129** (2): 331–344. https://doi.org/10.1676/16-100.1

Obertegger, U. & Agabiti, B. 2012. On the usefulness of ratios for the identification of some Mediterranean species of the genus *Ameles* Burmeister, 1838 (Insecta, Mantodea). *Zootaxa* **3259** (1): 34–50. https://www.researchgate.net/publication/288545535

Orni, E. & Efrat, E. 1971. *Geography of Israel*. 3rd revised edition. Jerusalem: Israel Universities Press, 551 p.

Otte, D., Spearman, L. & Stiewe, M.B. 2023. *Mantodea Species File Online*. Version 5.0/5.0. http://mantodea.speciesfile.org (accessed on 31 December 2024).

Panhwar, W.A., Tasleem, S., Asif, M., Alam, M., Anwar, F., Nisa, Z.U., Jatoi, N.A. & Bhatti, W. A. 2020. Praying mantis (Mantodea: Dictyoptera) of Pakistan: A review based study. *Bulletin of Environment, Pharmacology and Life Sciences* **9**: 180–183. https://www.researchgate.net/profile/Nisar-Jatoi/publication/348648735

Patel, S., Singh, G. & Singh, R. 2016. General distribution of Empusidae, Eremiaphilidae, Galinthiadidae and Iridopterygidae (Mantodea: Dictyoptera: Insecta): A checklist. *International Journal of Zoological Investigations* **2**: 219–236. https://www.researchgate.net/publication/311963598

Pe'er, G. & Settele, J. 2008. The rare butterfly *Tomares nesimachus* (Lycaenidae) as a bioindicator for pollination services and ecosystem functioning in northern Israel. *Israel Journal of Ecology and Evolution* **54** (1): 111–136. https://doi.org/10.1560/IJEE.54.1.111

Prete, F.R. & Hemilton K. 1999. Prey capture. *In*: Prete, F.R., Wells, H., Wells, P.H. & Hurd, L.E. (Eds), *The praying mantids*. Johns Hopkins University Press, Baltimore, pp. 194–223.

Prete, F.R. 1999. Prey recognition. *In*: Prete, F.R., Wells, H., Wells, P.H. & Hurd, L.E. (Eds), *The praying mantids*. Johns Hopkins University Press, Baltimore, pp. 183–193.

Ramme, W. 1951. Zur Faunistik und Biologie der Orthopteren von Südost-Europa und Vorderasien. *Mitteilungen aus dem Zoologischen Museum in Berlin* **27**: 1–431.

Ramsay, G.W. 1990. *Mantodea (Insecta), with a review of aspects of functional morphology and biology. Fauna of New Zealand*. Vol. 19. DSIR Publishing, Wellington. 96 pp. https://doi.org/10.7931/J2/FNZ.19

Rare Book Division, The New York Public Library. 1809*a*. *Zoologie. Orthoptères. Forficules, Mantes*. https://digitalcollections.nypl.org/items/1c5621f0-c633-012f-8436-58d385a7bc34 (accessed 31.xii.2024).

Rare Book Division, The New York Public Library. 1809*b*. *Zoologie. Orthoptères. Mantes, Blattes*. https://digitalcollections.nypl.org/items/1ca490d0-c633-012f-2ba0-58d385a7bc34 (accessed 31.xii.2024).

Richler, C. 2006. Jacob Wahrman (1924–2005). *Cytogenetic and Genome Research* **112** (3–4): 181–183. https://doi.org/10.1159/000091554

Roonwal, M.L. 1938. The frightening attitude of a Desert Mantid, *Eremiaphila Braueri* Kr. (Orthoptera, Mantodea). *Proceedings of the Royal Entomological Society of London. Series A, General Entomology* **13** (4–6): 71–72. https://doi.org/10.1111/j.1365-3032.1938.tb00418.x

Roy, R. 1987. Overview of the biogeography of African mantides. *In*: Baccetti, B. (Ed.), *Evolutionary Biology of Orthopteroid Insects*. Ellis Horwood Limited, Chichester, pp. 489–495.
Roy, R. 1999. Morphology and taxonomy. *In*: Prete, F.R., Wells, H., Wells, P.H. & Hurd, L.E. (Eds), *The praying mantids*. Johns Hopkins University Press, Baltimore, pp. 19–68.
Roy, R. 2004. Réarrangements critiques dans la famille des Empusidae et relations phylogénétiques [Dictyoptera, Mantodea]. *Revue Française d'Entomologie* **26** (1):1–18.
Roy, R. 2009. Revision of the Toxoderini novo sensu (Mantodea, Toxoderinae). *Revue suisse de Zoologie* **116** (1): 93–183.
Roy, R. & Stiewe, M.B. 2014. Révision du genre *Galinthias* Stål, 1877 (Mantodea, Galinthiadidae). *Bulletin de la Société entomologique de France* **119** (2): 199–215. https://www.persee.fr/doc/bsef_0037-928x_2014_num_119_2_29353
Saussure, H. de 1871. Mélanges Orthoptérologiques. Fasc. 3. *Mémoires de la Société de Physique et d'Histoire Naturelle de Genève* **1** (1–3): 149–462. https://www.biodiversitylibrary.org/item/122147#page/170
Saussure, H. de 1872. Mélanges Orthoptérologiques. IV Fascicule. Mantides et Blattides. *Mémoires de la Société de Physique et d'Histoire Naturelle de Genève* **23** (1): 1–165. https://www.biodiversitylibrary.org/item/122148#page/98/mode/1up
Schmidt-Rhaesa, A. & Ehrmann, R. 2001. Horsehair worms (Nematomorpha) as parasites of praying mantids with a discussion of their life cycle. *Zoologischer Anzeiger, A Journal of Comparative Zoology* **240** (2): 167–179. https://doi.org/10.1078/0044-5231-00014
Schwarz, C. & Roy, R. 2019. The systematics of Mantodea revisited: An updated classification incorporating multiple data sources (Insecta: Dictyoptera). *Annales de la Société Entomologique de France (N.S.)* **55** (2): 101–196. https://doi.org/10.1080/00379271.2018.1556567
Schwarz, C.J. & Ehrmann, R. 2018. Invasive Mantodea species in Europe. *Articulata - Zeitschrift der Deutschen Gesellschaft für Orthopterologie e.V. DGfO* **33**: 73–90. https://dgfo-articulata.de/downloads/articulata/articulata_33_2018/Articulata_33_Schwarz-Ehrmann.pdf
Sevgili, H. & Yilmaz, K. 2022. Contributions of citizen scientists to monitoring alien species: the case study on Giant Asian Mantes, *Hierodula tenuidentata* and *H. patellifera* (Mantodea: Mantidae). *Zoology in the Middle East* **68** (4): 350–358. https://doi.org/10.1080/09397140.2022.2145802
Shcherbakov, E.O. & Savitsky, V.Y. 2015. New data on the fauna, taxonomy and ecology of praying mantises (Dictyoptera, Mantodea) from Russia. *Entomological Review* **95**: 181–199. https://doi.org/10.1134/S0013873815020049
Sherborn, C. D. 1897. On the Dates of the Natural History portions of Savigny's 'Description de l'Egypte'. *Proceedings of the Zoological Society of London*: 285–288. https://www.biodiversitylibrary.org/item/97165#page/349/
Shmida, A. & Or, Y. 1983. *The biogeography of the Sudanian flora in the Dead-Sea rift of Israel. 8. Rotem: network for botanical observation arid information Israel*. Society for the Protection of Nature, 150 pp. [in Hebrew, with English summary]
Sorek, M., Shamon, H., Shapira, I., Perelberg, A., Hershkovitz, Y., Weil, G., Levinsky, I., Lebel, M., Walczak, M., Shacham, B. & Chen, R. 2018. *State of Nature Report*. Hamaarag, The Steinhardt Museum of Natural History, Tel Aviv University. [in Hebrew with English abstract] https://www.researchgate.net/publication/350975317
MOAG [State of Israel, Ministry of Agriculture and Rural Development]. 2009. *Plant import regulations*. https://www.gov.il/blobfolder/legalinfo/plant_import_regulations_2009_unofficial_translation/he/procedure_plantimportregulations2009unofficialtranslation.pdf
Stål, C. 1871. Orthoptera quædam africana descripsit C. Stål. *Öfversigt af Kongl. Vetenskaps-akademiens forhandlingar* **28** (3): 375–401. https://www.biodiversitylibrary.org/item/100497#page/399
Stål, C. 1877. Systema Mantodeorum. Essai d'une systematisation nouvelle des Mantodées. *Bihang Till Kongl. Svenska vetenskaps-akademiens handlingar* **4** (10): 1–91. https://www.biodiversitylibrary.org/item/49926#page/491
Stiewe, M.B.D., Weinstein, A. & Simon D. 2025. *Roythespis israelensis* gen. et sp. n., a new praying mantis from Israel (Dictyoptera: Mantodea: Toxoderidae). *Israel Journal of Entomology* 54: 95–112. https://doi.org/10.5281/zenodo.17761269

Straka, J. & Schmid-Egger, C. 2017. Order Hymenoptera, family Crabronidae. Genus *Tachysphex* Kohl. *Arthropod fauna of the UAE* **6**: 417–**4**61. https://www.researchgate.net/publication/316454953

Survey of Israel. 2009. *Israel – Touring map. North & South sheets. List of settlements, antiquity sites and road distances. Scale 1:250,000.* The survey of Israel, Tel Aviv.

Svenson, G.J. & Whiting, M.F. 2004. Phylogeny of Mantodea based on molecular data: evolution of a charismatic predator. *Systematic Entomology* **29** (3): 359–370. https://doi.org/10.1111/j.0307-6970.2004.00240.x

Svenson, G.J. & Whiting, M.F. 2009. Reconstructing the origins of praying mantises (Dictyoptera, Mantodea): the roles of Gondwanan vicariance and morphological convergence. *Cladistics* **25** (5): 468–514. https://doi.org/10.1111/j.1096-0031.2009.00263.x

Svenson, G.J, Hardy, N., Wightman, H. & Wieland, F. 2015. Of flowers and twigs: Phylogenetic revision of the plant-mimicking praying mantises (Mantodea: Empusidae and Hymenopodidae) with a new suprageneric classification. *Systematic Entomology* **40**: 789–834. https://doi.org/10.1111/syen.12134

Swinton, A.H. 1899. Orthoptera found around Jerusalem in 1893 and 1896. *The Entomologist's Monthly magazine* **35**: 39–42. https://www.biodiversitylibrary.org/item/36027#page/49

Theodor, O. 1975. *Fauna Palaestina, Insecta I: Diptera, Pupipara*. Israel Academy of Sciences and Humanities, Jerusalem, 169 pp.

Thunberg, C. P. 1815. Hemipterorum maxillosorum genera illustrata. (Orthoptera – Mantodea). *Mémoires de l'Académie Impériale des Sciences de St. Pétersbourg* **5**: 211–301. https://www.biodiversitylibrary.org/item/44403#page/7/mode/1up

Tollitt, M. E. 1986. Dates and authorship of the text volumes of the Histoire Naturelle section of Savigny's description de l'Egypte Z.N.(S.) 2515. *Bulletin of Zoological Nomenclature* **43** (1): 107–111. https://doi.org/10.5962/bhl.part.388

Uvarov, B.P. 1922. Records and descriptions of Orthoptera from SW Asia. *Journal of the Bombay Natural History Society* **28**: 719–738. https://www.biodiversitylibrary.org/partpdf/69336

Uvarov, B.P. 1923. Records and descriptions of Orthoptera from North-West Africa. *Novitates zoologicae* **30**: 59–78. https://www.biodiversitylibrary.org/page/3242563#page/75

Uvarov, B.P. 1924. Some new and interesting Orthoptera in the collection of the Ministry of Agriculture, Cairo. *Bulletin of the Ministry of Agriculture, Egypt, Technical and Scientific Service* **41**: 1–41, pls 1–3.

Uvarov, B.P. 1929. Orthoptera collected in Sinai by Dr F.S. Bodenheimer and Dr O. Theodor. *In*: Bodenheimer, F.S & Theodor, O. (Eds), *Ergebnisse Sinai-Expedition 1927, der Hebräischen Universität, Jerusalem,herausgegeben von Friedrich Simon Bodenheimer und Oskar Theodor, mit 60 Abbildungen und auf 24 Tafeln.*, J.C. Hinrichs'sche Buchhandlung, Leipzig, pp. 90–103.

Uvarov, B.P. 1930. LXIV. Notes on Palaearctic Mantidae (Orthoptera). *Annals and Magazine of Natural History* **5** (30): 631–633. https://doi.org/10.1080/00222933008673176

Uvarov, B.P. 1931. XXXI. Notes on the genus *Iris* Saussure (Orthoptera, Mantidae). *Annals and Magazine of Natural History* **8** (45): 234–238. https://archive.org/details/dli.ernet.24535/page/233

Uvarov, B.P. 1933. LXXII. Notes on new and little-known orthoptera from Palestine. *Annals and Magazine of Natural History* **11** (66): 663–**6**72. https://doi.org/10.1080/00222933308673740

Uvarov, B.P. 1936. Studies in the Arabian Orthoptera. I. Descriptions of new genera, species and subspecies. *Zoological Journal of the Linnean Society* **39** (268): 531–558. https://doi.org/10.1111/j.1096-3642.1936.tb00262.x

Uvarov, B.P. 1938. Orthoptera from Iraq and Iran. *Field Museum of Natural History*, **20**: 439–**4**51. https://www.biodiversitylibrary.org/item/20742#page/7

Uvarov, B.P. 1939*a*. Studies in the Arabian Orthoptera. II. New and little-known Mantidae and Phasmidae. *Zoological Journal of the Linnean Society* **40** (274): 547–559. https://doi.org/10.1111/j.1096-3642.1939.tb01938.x

Uvarov, B.P. 1939*b*. XV. New and less-known Palestinian Orthoptera. *Annals and Magazine of Natural History* **4** (20): 216–227. https://doi.org/10.1080/00222933908526986

Uvarov, B.P. 1943. Orthoptera of the Siwa oases. *Proceedings of the Linnean Society of London* **155** (1): 8–30. https://doi.org/10.1111/j.1095-8312.1943.tb00337.x

van der Sluijs, J.P. 2020. Insect decline, an emerging global environmental risk. *Current Opinion in Environmental Sustainability* **46**: 39–42. https://doi.org/10.1016/j.cosust.2020.08.012

Vidal-García, M., O'Hanlon, J.C., Svenson, G.J. & Umbers, K.D. 2020. The evolution of startle displays: a case study in praying mantises. *Proceedings of the Royal Society B* **287**: 20201016. https://doi.org/10.1098/rspb.2020.1016

Villani, M. 2020. Proposal of a new arrangement of the Amelini genera *Ameles* Burmeister, 1838 and *Parameles* Saussure, 1869 status restauratus with taxonomic remarks on some species (Insecta: Mantodea: Amelidae). *Quaderno di Studi e Notizie di Storia Naturale della Romagna* **52**: 111–174. https://www.researchgate.net/publication/348236681

Vujić, M. & Ivković, S. 2023. New records of allochthonous *Hierodula tenuidentata* Saussure, 1869 (Mantodea: Mantidae) from Southeastern Europe, with evidence of its spread across the Pannonian Plain. *Natura Croatica: Periodicum Musei Historiae Naturalis Croatici* **32** (1): 69–79. https://doi.org/10.20302/NC.2023.32.5

Wellcome Collection. 2024. *Patrick Alfred Buxton*. Photograph. Public Domain Mark. https://wellcomecollection.org/works/gzbprsub (assecced on 31.xii.2024).

Werner, F. 1905. Ergebnisse einer zoologischen Forschungsreise nach Ägypten und dem ägyptischen Sudan. I. Die Orthopterenfauna Ägyptens mit besonderer Berücksichtigung der *Eremiaphila*. *Sitzungsberichte der mathematisch-naturwissenschaftichen Klasse der Akademie der Wissenschaften Wien, Abt. 1* **114** (5): 357–436. https://archive.org/details/sbaww_114_0357-0436

Werner. 1908. Die Mantodeen Abessyniens. *Annuaire du Musée zoologique de l'Académie des sciences de St. Pétersbourg* **13**: 108–128. https://www.biodiversitylibrary.org/item/37010#page/261/mode/1up

Werner, F. 1912. Une nouvelle Mantide égyptienne (Orthopt.). *Bulletin de la société entomologique de d'Égypte* **5** (1): 23. https://archive.org/details/bulletindelasoci3191213jami/page/n39

Werner, F. 1928. Zur Kenntnis der Mantodeenfauna des Hinterlandes von Kamerun und des Sepikgebietes von Neuguinea. *Mitteilungen aus dem Zoologischen Museum in Berlin* **14**: 40–41.

Wieland, F. 2008. Digging for the offspring, or how to bury an ootheca underground. P. 344. *In*: Gradstein, S.R., Klatt, S., Normann, F., Weigelt, P., Willmann, R. & Wilson, R. (Eds), *Systematics 2008, Göttingen 7-11 April 2008. Systematics 2008 Programme and Abstracts Göttingen 7-11 April 2008. 10th Annual Meeting of the Gesellschaft für Biologische Systematik; 18th International Symposium „Biodiversity and Evolutionary Biology" of the German Botanical Society*. Universitätsverlag Göttingen. 425 p. https://www.researchgate.net/publication/270889933

Wieland, F. 2013. *The phylogenetic system of Mantodea (Insecta: Dictyoptera)*. (doctoral thesis). Göttingen: Universitätsverlag Göttingen, 222 pp. https://www.researchgate.net/publication/270819907

Wieland, F. & Svenson, G. 2018. 15. Biodiversity of Mantodea. *In*: Foottit, R.G. & Adler, P.H. (Eds), *Insect biodiversity: science and society.* Vol. II. John Wiley & Sons Ltd, pp. 389–416. https://doi.org/10.1002/9781118945582.ch15

Worboys, M. 2022. Imperial entomology: Boris P. Uvarov and locusts, c.1920–c.1950. *The British Journal for the History of Science* **55** (1): 27–51. https://doi.org/10.1017/S0007087421000807

Yager, D. 1999. Hearing. *In*: Prete, F.R., Wells, H., Wells, P.H. & Hurd, L.E. (Eds), *The praying mantids*. Johns Hopkins University Press, pp. 93–113.

Yilmaz, K. & Sevgili, H. 2023. The genus *Holaptilon* Beier, 1964: discussion on the poorly known boxer mantis genus, with a new species (Mantodea, Gonypetidae). *Zootaxa* **5231** (4): 427–444. https://doi.org/10.11646/zootaxa.5231.4.5

Zafon, Z. 2017. Acacia trees in the 'Arava – Policy Paper. *Forest – Journal of Forests and Open Lands Management* 17: ii, 46–53 [in Hebrew, with English abstract]. https://www.kkl.org.il/forest_online_journal_yaar17_zohar_zafon

Zohary, M. 1962. *Plant life of Palestine: Israel and Jordan*. The Ronald Press Company, 262 pp.