

Spiders of the genera *Euryopis* and *Dipoena* (Araneae: Theridiidae) from Israel

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Summary

Theridiid spiders from Israel of the genera *Euryopis* and *Dipoena* have been revised. All the species formerly described from this region were re-examined, and consequently new synonyms have been established. A key and detailed illustrations are provided for each species. The following new species are described: *Euryopis hebraea*, *Dipoena trapezoidalis* and *D. galilaea*.

Introduction

Euryopis and *Dipoena* species are among the smallest theridiid spiders of Israel. Spiders of the two genera are not frequently found; *Dipoena* is even considered rare. Scarcity, mainly of *Dipoena*, is reported also for other regions. Most specimens in this region have been collected in relatively moist places, often with dense vegetation. Such environments are scarce in Israel. Possibly intensive collecting, especially of small arthropods living under stones and in leaf litter, may eventually yield more material. Ants have been observed on several occasions as constituting the food of these spiders, although none of these spiders is known to live in association with ants.

Females of *Euryopis* and *Dipoena* species in Israel all have two pairs of seminal receptacles, whereas those of other genera have only one pair. The two genera are considered related, representing possibly a separate line of evolution among the Theridiidae (Levi, 1963); generic diagnoses were published by Levi & Levi (1962).

This study is based on material in the collection of the Hebrew University of Jerusalem (HUJ). *Euryopis* species described from this region by Cambridge (1872, 1876) deposited in the Hope Entomological

Collection, Oxford (HECO) and by Strand (1914) in the Senckenberg Museum, Frankfurt (SMF), have been examined and all have been found again. The study of European and North African species from material in the Muséum National d'Histoire Naturelle, Paris (MNHN), enabled us to establish the occurrence of some also in our region. In addition, all species of *Erigone* (Linyphiidae s. l.) in Oxford, described from this region by Cambridge (1872, 1876) have been examined. None were misidentified *Dipoena*, *Euryopis* or other Theridiidae (including *Erigone femoralis*, misinterpreted by all subsequent authors as *Robertus*, Theridiidae).

Localities in Israel are listed from north to south and spelled according to the 1:250,000 map by the Survey of Israel, Ministry of Labour (1964, partly revised 1967). Measurements are in mm; the carapace index is length divided by width, and the clypeus index is clypeus height divided by diameter of one of the anterior median eyes.

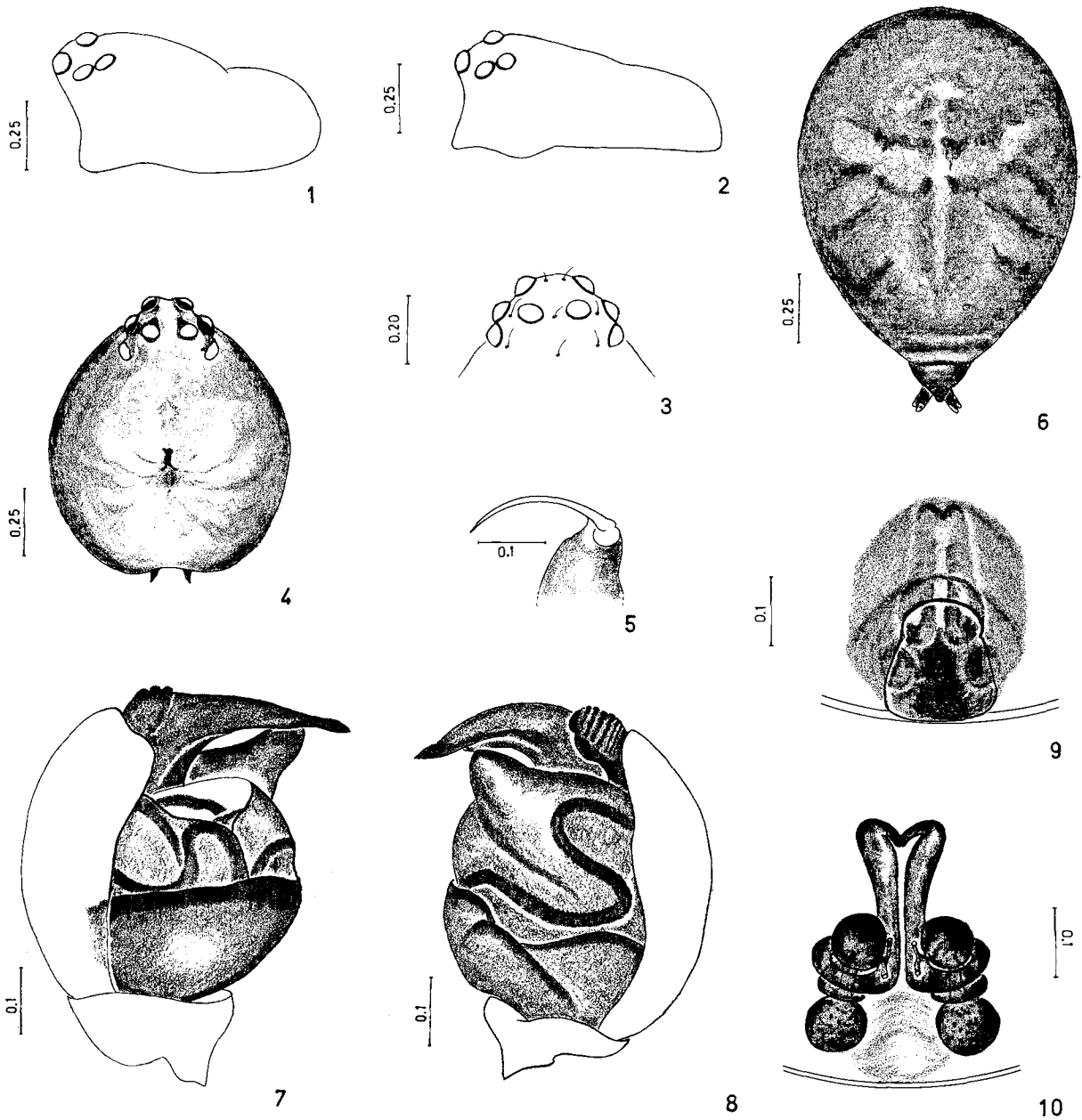
Genus *Euryopis* Menge, 1868

Type-species: *Micryphantes flavomaculatus* C. L. Koch, 1836.

Small spiders, total length about 1-6 mm, usually 2-3 mm. Prosoma often stout with a high clypeus in males, usually lower in females (Figs. 1, 2, 11, 12, 20). Size of anterior median eyes variable relative to size of other eyes (Figs. 1, 11, 20). Anterior lateral and posterior lateral eyes touching or nearly touching. Median eye quadrangle usually wider in front than behind (Figs. 3, 4). Chelicerae lacking teeth; fang long and thin (Fig. 5). Fourth pair of legs longest, length of remaining pairs varies slightly. Opisthosoma usually triangular, pointed behind (Fig. 6). Colulus usually visible as two small setae.

Remarks

We follow the generic revisions by Levi (1954, 1963) for the American species, and by Miller (1963) for the more common European species. *Euryopis* species in Israel are readily separated from *Dipoena* by the form of the opisthosoma: in *Dipoena* it usually is globular, while in *Euryopis* it is triangular, widest in front and pointed behind, above the spinnerets. *Euryopis* spiders are not known to spin webs,



Figs. 1-10: *Euryopsis acuminata* (Lucas). 1 ♂ carapace, lateral view; 2 ♀ carapace, lateral view; 3 ♂ eye disposition, dorsal view (detail); 4 ♂ carapace, dorsal view; 5 ♂ tip of chelicera; 6 ♂ opisthosoma, dorsal view; 7 ♂ left palpus, mesal view; 8 ♂ left palpus, lateral view; 9 ♀ epigynum; 10 ♀ spermathecae, dorsal (inner) view.

Coloration: Prosoma black or yellow brown, sometimes with a dark marginal line (Fig. 4). Legs yellowish brown to dark grey, sometimes with light and dark parts giving a broadly banded appearance. Opisthosoma brownish to shiny black; sometimes slightly lighter but dull markings visible on back (Fig. 6).

Male

Measurements (8 ♂♂): total length 2.0-2.4; carapace length 0.86-1.05, width 0.75-0.92, height (anteriorly) 0.44-0.57; carapace index 1.03-1.17; clypeus height 0.30-0.45; clypeus index 5.28-6.33; leg I, length: femur 0.65-0.90, patella + tibia 0.75-1.00, metatarsus 0.50-0.70, tarsus 0.35-0.40; leg IV, length: femur 0.77-1.00, patella + tibia 0.88-1.19, metatarsus 0.61-0.88, tarsus 0.42-0.50.

Palpus: Peculiar; homology of various sclerites with those of other *Euryopsis* species uncertain. Palp apically furnished with a large, sclerotised, partially bent and pointed prominence (Figs. 7, 8); outside, at base of prominence, under apical edge of cymbium, rises a dark, obtuse and roughened protuberance (Fig. 8).

Female

Measurements (10 ♀♀): total length 2.5-3.5; carapace length 0.90-1.07, width 0.85-1.00, height (anteriorly) 0.38-0.52; carapace index 1.04-1.13; clypeus height 0.25-0.32; clypeus index 3.57-4.67; leg I, length: femur 0.78-0.90, patella + tibia 0.88-1.00, metatarsus 0.61-0.70, tarsus 0.40-0.43; leg IV, length: femur 0.88-1.10, patella + tibia 1.07-1.25, metatarsus 0.75-0.90, tarsus 0.42-0.53.

Epigynum: Epigynal plate with a large, central, partly rounded orifice from which a broad, shallow canal extends to epigastric furrow (Fig. 9); long tubes of internal organs sometimes discernible through integument. Internally, two long, straight, thick tubes run parallel, medially (Fig. 10); the tubes then form strong coils, partly surrounding each of the two pairs of spermathecae (Fig. 10).

Diagnosis

The general appearance of *E. acuminata* is clearly that of *Euryopsis*, but the genital features of both sexes are unusual. The peculiar male palp and the long, thick tubes of the internal organs of the female

differ distinctly from all other *Euryopsis* species. *Euryopsis acuminata* may represent a separate evolutionary line in *Euryopsis*.

Distribution

Throughout southern Europe, from Portugal to Bulgaria and Greece; in northern Africa, from Morocco to Egypt and Eritrea, and in Israel.

Records

Israel: Throughout north and central parts of the country, in the mountains as well as in the Coastal Plain and the Jordan Valley.

Comments

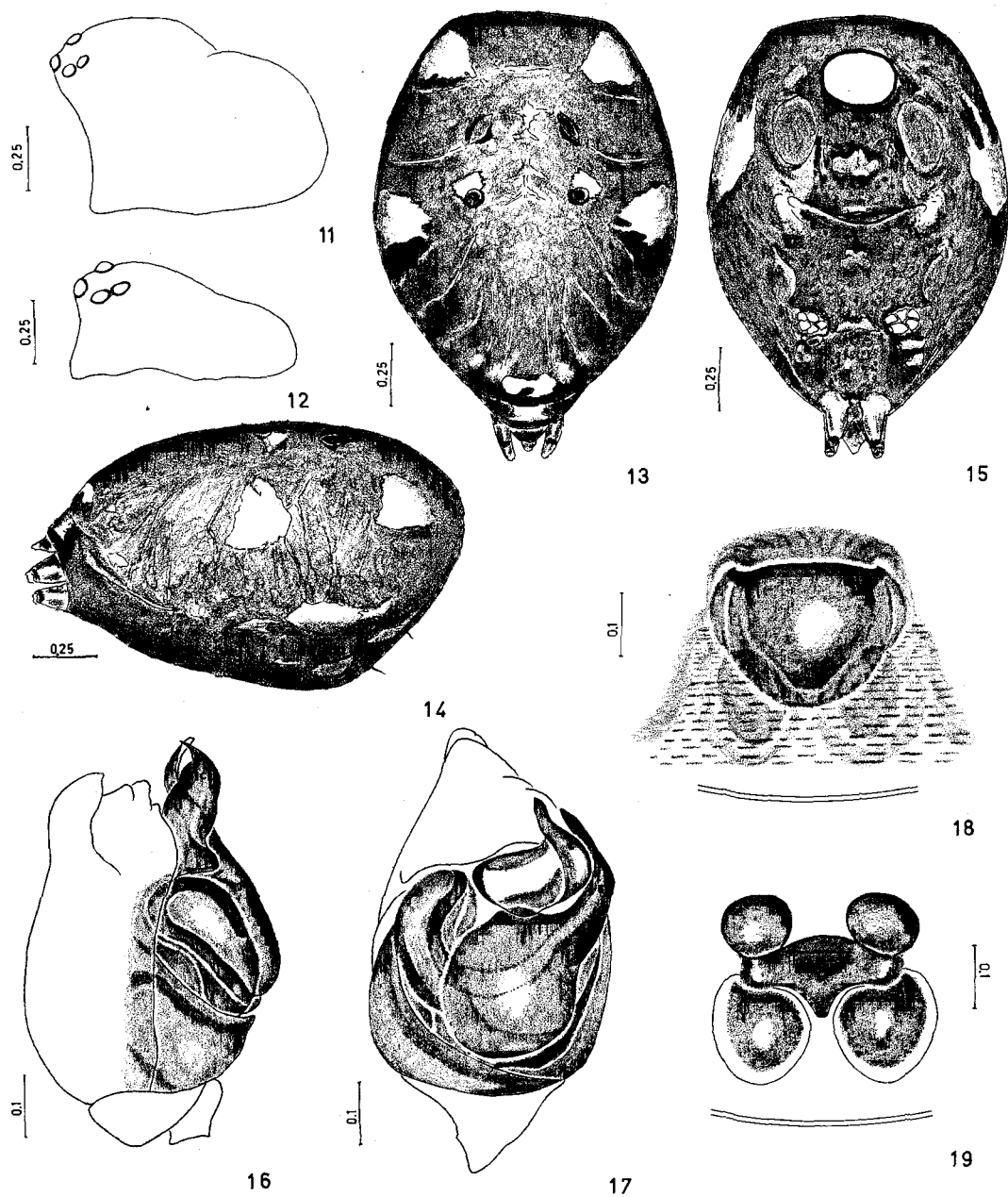
Adult males and females are found² in the field almost throughout the year, mainly from March to October. A female with an egg sac was taken in the middle of September.

Specimens of *E. acuminata* have been described as different species on the basis of variations in colour: *tarsalis* is the light brown form from Europe, while *scripta* is its parallel in the Middle East; *acuminata* is brown to almost black, and *quadrimaculata* is an intermediate form with suffused light markings. Close examination shows many colour intergrades. The study of morphometric characters like the position of the eyes and their relative sizes, proportions of prosoma, form of the claws, particularly of the fan-shaped claw on the palp of the female, and finally the structure of the genitalia, reveals that all colour variations belong to one and the same species. All the colour variations occur in Israel and show no distinct ranges, and the distinction of subspecies seems unjustified.

Euryopsis sexalbomaculata (Lucas, 1846) (Figs. 11-19)

Theridion sexalbomaculatum Lucas, 1846: 265, pl. 17, fig. 8, type ♂ from Constantine, Algeria, cannot be traced with certainty, presumably among specimens det. E. Simon (MNHN). *Euryopsis sexalbomaculata*: Simon, 1881: 130, adult ♂, ♀ from Tunisia (MNHN, B. 761; examined); Roewer, 1942: 452; Bonnet, 1956: 1827.

Theridion particeps Cambridge, 1872: 282, adult ♂ and immature ♂ from Jerusalem and Hebron, Israel (HECO, B.588, t. 14; examined). *Euryopsis particeps*: Simon, 1881: 129; Roewer, 1942: 452; Bonnet, 1956: 1825. NEW SYNONYMY.



Figs. 11-19: *Euryopsis sexalbomaculata* (Lucas). 11 ♂ carapace, lateral view; 12 ♀ carapace, lateral view; 13 ♂ opisthosoma, dorsal view; 14 ♂ opisthosoma, lateral view; 15 ♂ opisthosoma, ventral view; 16 ♂ left palpus, mesal view (C = conductor, E = embolus); 17 ♂ left palpus, ventral view; 18 ♀ epigynum; 19 ♀ spermathecae, dorsal (inner) view.

Coloration: Prosoma deep brown, eye region black (Figs. 11, 12). Legs yellow and partly black, mainly on the longer segments. Opisthosoma black with a series of distinct white, silvery spots on back, sides and venter (Figs. 13, 14, 15); the spots may vary slightly in size, sometimes the hinder ones become almost confluent or connected by white streaks.

Male

Measurements (3 ♂♂): total length 2.7-2.9; carapace length 1.08-1.20, width 0.95-1.07, height (anteriorly) 0.75-0.80; carapace index 1.09-1.13; clypeus height 0.58-0.60; clypeus index 9.67-10.0; leg I, length: femur 0.70-0.80, patella + tibia 0.78-0.93, metatarsus 0.57-0.66, tarsus 0.37-0.40; leg IV, length: femur 0.78-0.98, patella + tibia 0.96-1.12, metatarsus 0.70-0.80, tarsus 0.40-0.43.

Palpus: Cymbium rather broad apically and extended to a pointed tip projecting about as high as tips of embolus and conductor (Figs. 16, 17); tip of embolus twists partly around tip of conductor, and both point upwards (Figs. 16, 17).

Female

Measurements (4 ♀♀): total length 2.8-3.0; carapace length 0.90-0.96, width 0.86-0.93, height (anteriorly) 0.45-0.48; carapace index 1.00-1.04; clypeus height 0.27-0.34; clypeus index 4.50-5.67; leg I, length: femur 0.72-0.78, patella + tibia 0.81-0.88, metatarsus 0.55-0.60, tarsus 0.33-0.38; leg IV, length: femur 0.90-0.95, patella + tibia 1.02-1.10, metatarsus 0.76-0.80, tarsus 0.40-0.45.

Epigynum: Central part of epigynal plate covered by a dark brown shield-shaped plate (Fig. 18); an atrium extending below basal rim of central plate is sometimes concealed by pieces of embedded brown material. Dark oval bodies of internal organs sometimes visible through integument on distal part of epigynum, close to epigastric furrow (Fig. 18). Internal organs consist of two pairs of dark, round spermathecae connected by a broad, deep brown, sclerotised band (Fig. 19).

Diagnosis

Euryopsis sexalbomaculata belongs clearly to the group of *Euryopsis* species represented by *E. flavo-*

maculata. The shape of the sclerites of the male palp and the form of the epigynal plate and spermathecae of the female are diagnostic characters that easily distinguish *E. sexalbomaculata* from all other *Euryopsis* species.

Distribution

Algeria, Tunisia, Libya and Greece (Bonnet, 1956); Israel.

Records

Israel: Kinneret, Jerusalem, En Hemed, Kesalon, Bet Guvrin, Hebron.

Comment

Adult males and females were found under stones in April and May.

Euryopsis hebraea sp. n. (Figs. 20-22)

Holotype: Adult male from Jerusalem, Israel, 19 April 1937, leg. A. Shulov (HUJ 11700).

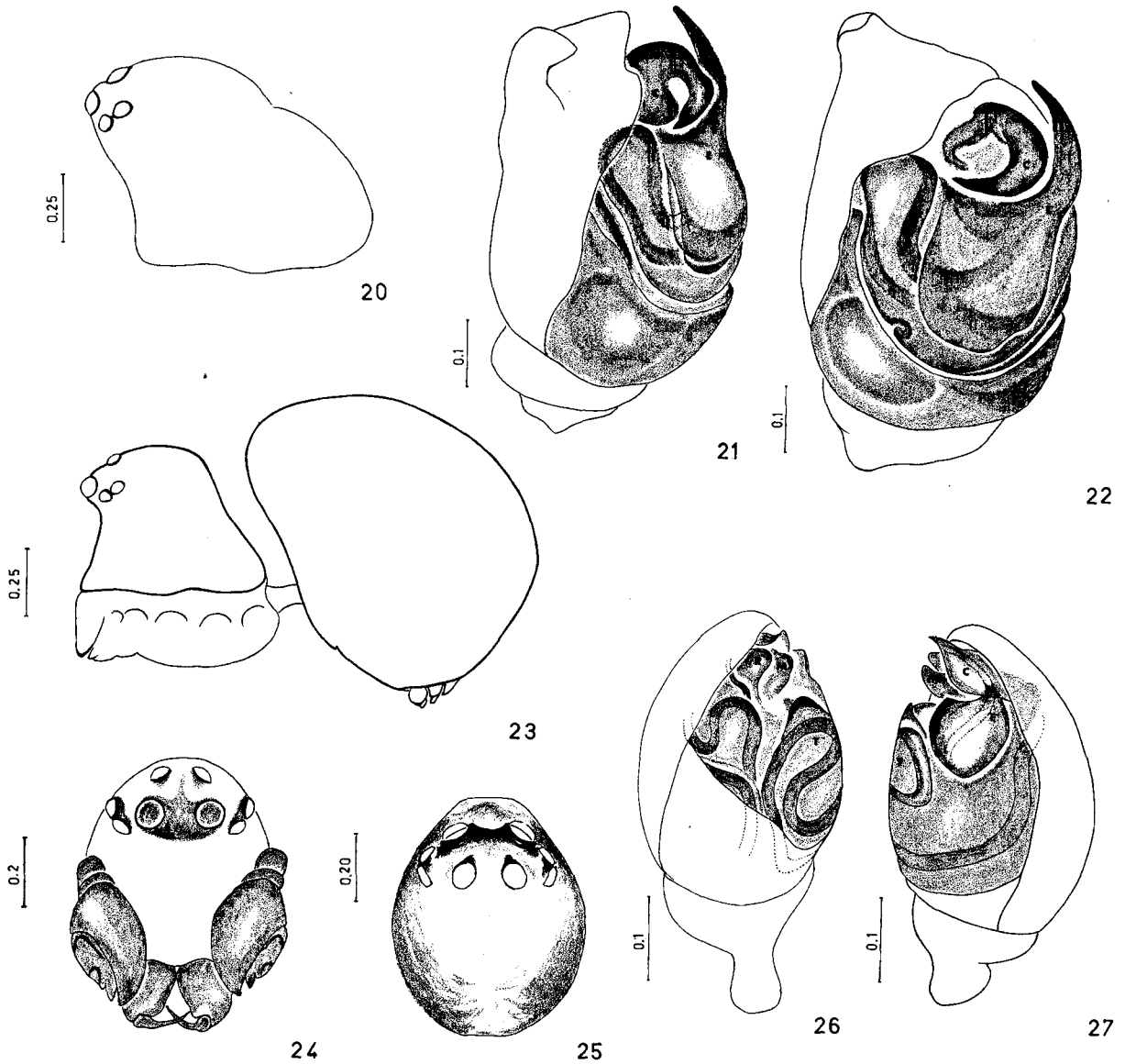
Coloration: Colours have long faded. Prosoma (Fig. 20) was apparently brown and opisthosoma black with white spots, arranged as in *E. sexalbomaculata*.

Measurements (of ♂ holotype): total length 2.65; carapace length 1.1, width 1.0, height (anteriorly) 0.75; clypeus height 0.50; clypeus index 7.14; leg I, length: femur 0.70, patella + tibia 0.85, metatarsus 0.66, tarsus 0.36; leg IV, length: femur 0.90, patella + tibia 1.0, metatarsus 0.77, tarsus 0.38.

Palpus: Holotype; cymbium broad apically and extended to a pointed and slightly bent projection (Figs. 21, 22); arched tip of embolus points upwards while tip of conductor recurves on itself, pointing inwards (Figs. 21, 22).

Diagnosis

Based on male. In the arrangement of the white spots on the opisthosoma and the general form of the palp, *E. hebraea* closely resembles *E. sexalbomaculata*. But the form of the conductor, with its strong curvature, distinguishes this palp clearly from other male *Euryopsis*. Female unknown.



Figs. 20-22: *Euryopsis hebraea* sp. n., ♂ holotype. 20 Carapace, lateral view; 21 Left palp, mesal view (C = conductor, E = embolus); 22 Left palp, ventral view.

Figs. 23-27: *Dipoena trapezoidalis* sp. n., ♂ holotype. 23 Lateral view (legs omitted); 24 Frontal view; 25 Carapace, dorsal view; 26 Left palp, mesal view; 27 Left palp, lateral view. (C = conductor, E = embolus, M = median apophysis, R = radix, T = tegulum).

Distribution

Israel: Known only from the type locality, Jerusalem.

Genus Dipoena Thorell, 1869

Type-species: *Atea melanogaster* C. L. Koch, 1837.

Small theridiid spiders, total length 1.5 mm, many only about 2 mm (Fig. 23). Carapace short, and in males, often very high (Figs. 23, 28). Eye region usually projecting above concave clypeus. Anterior median eyes sometimes larger than others, and placed rather close to anterior lateral eyes (Figs. 24, 31). Anterior lateral and posterior lateral eyes touching. Median eye quadrangle wider in front than behind (Figs. 25, 30). Chelicerae small and without teeth (Fig. 24). First leg commonly the longest, third always the shortest. Opisthosoma usually almost spherical, wide above and higher than long (Figs. 23, 32, 38). Colulus visible as two small setae.

A complete generic revision and descriptions of numerous American species were published by Levi (1953 a, b, 1963).

Remarks

Dipoena species, apart from being rather small, are easily distinguished from other theridiid genera of this region by the strong projecting eye region, globular opisthosoma and the very high, often peculiarly shaped carapace of the males. *Dipoena* spiders live on trees, some on lower vegetation and in leaf litter, others on the ground and under stones. Very little is known about their biology. A very small web made of fine threads spun at bases of twigs or among conifer needles with remnants of ants suspended in it has been described in very few cases (Wiehle, 1937; Miller, 1967). Probably many feed on ants.

Members of the genus *Dipoena* have been reported from many parts of the world and their occurrence in the Middle East is herein established. Nearly one hundred species have been described from America (Levi, 1963), about twenty from Europe, and about another two dozen from Africa, south eastern Asia and Australia. Many more can be expected to be found in the tropics. Although numerous *Dipoena* species have been described, most are known from only very few specimens even from well-collected places in central Europe. All authors indicate these

spiders to be rare, some even extremely rare, and showing a very scattered distribution. Many species, therefore, are represented by only one of the sexes.

The relatively minute male palpal organ shows a complexity of structure and duct windings that sometimes is difficult to trace. The males of the different local species can also be distinguished, however, by the form of the carapace. External features of the female's epigynum are rather indistinct, but clearing the internal genitalia from the dorsal (inner) side or, even better, from the ventral (outer) side, discloses helpful diagnostic characters. The females of the two species in this region may also be easily separated by the coloration of the opisthosoma.

*Key to the species of Dipoena in Israel**Males*

1. Carapace about as high as wide, trapezoidal in profile (Fig. 23) *D. trapezoidalis* sp. n.
- Carapace distinctly wider than high *D. braccata* (C. L. Koch)

Females

1. Opisthosoma with a distinct, coloured pattern on dorsal surface (Fig. 39) *D. galilaea* sp. n.
- Opisthosoma uniformly black *D. braccata* (C. L. Koch)

Dipoena trapezoidalis sp. n. (Figs. 23-27)

Holotype: Adult male from Mt Carmel, Israel, 25 December 1971, leg. A. Peri (HUJ 13114).

Coloration: Carapace brown, high, trapezoidal (Figs. 23, 24, 25). Legs yellowish brown with only the terminal segments of the palps brown. High opisthosoma, uniformly black (Fig. 23).

Measurements (♂ holotype and 1 ♂; holotype listed first): total length 1.7, 1.7; carapace length 0.73, 0.68, width 0.63, 0.60, height 0.64, 0.62; clypeus height 0.39, 0.35; clypeus index 3.54, 3.89; leg I, length: femur 0.66, 0.65, patella + tibia 0.71, 0.70, metatarsus 0.39, 0.45, tarsus 0.24, 0.27; leg IV, length: femur 0.58, 0.59, patella + tibia 0.62, 0.63, metatarsus 0.43, 0.45, tarsus 0.25, 0.25.

Palpus: Holotype; small cone-shaped radix (R) resembles the median apophysis (M), the two being hardly separated (Figs. 26, 27). Apical rims of

tegulum (T) extend into a sclerotised, raised lobe (Figs. 26, 27).

Diagnosis

Based on male. The high trapezoidal carapace and the form of the palpal structures are diagnostic characters distinguishing *D. trapezoidalis* from other *Dipoena* species. Female unknown.

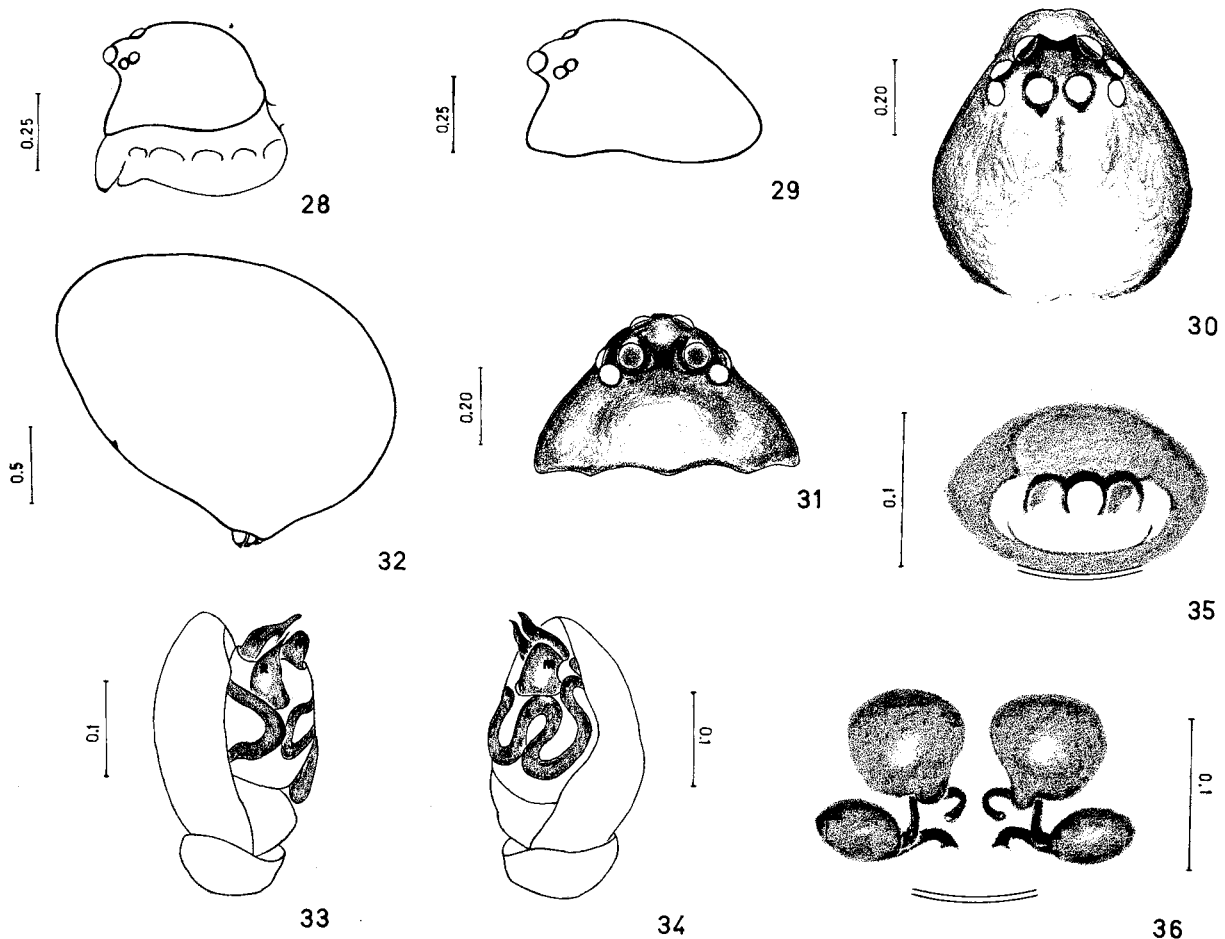
Distribution

Israel: Mt Carmel (holotype, under a stone; December), and near Dorot, northern Negev (in a hole in the ground; February).

Dipoena braccata (C. L. Koch, 1841) (Figs. 28-36)

Theridium braccatum C. L. Koch, 1841: 85, types from Karlsbad, Germany, not seen; adult ♂, ♀ from Germany, det. H. Wiehle (SMF 20822; examined). *Dipoena braccata*: Simon, 1894: 562; Roewer, 1942: 418; Levi, 1953b: 7, fig. 36; Bonnet, 1956: 1503; Miller, 1967: 290, pl. 13, figs. 5-9.

Coloration: Carapace of male brown (Fig. 28) and of female brown with black margins and dark eye region (Figs. 29-31). Legs of female light brown; legs and opisthosoma of male in HJ collection badly damaged and colours faded. Opisthosoma of female uniformly black (Fig. 32).



Figs. 28-36: *Dipoena braccata* (C. L. Koch). 28 ♂ prosoma, lateral view; 29 ♀ carapace, lateral view; 30 ♀ carapace, dorsal view; 31 ♀ carapace, frontal view; 32 ♀ opisthosoma, lateral view; 33 ♂ left palp, mesal view (C = conductor, M = median apophysis, R = radix); 34 ♂ left palp, lateral view; 35 ♀ epigynum; 36 ♀ spermathecae, dorsal (inner) view.

but run on the ground and among vegetation, preying on ants. The local *E. acuminata* has several times been observed feeding on black *Tapinoma* ants. Because of the similarity in coloration and body shape of spider and ant (both have a pointed abdomen), the two sometimes can hardly be distinguished in the field. Berland (1933: 5) observed this spider feeding on a *Camponotus* ant which differs, however, entirely in size and form. The European *E. flavomaculata* is reported to prey on *Myrmica* ants, using sticky threads (Hirschberg, 1969). Hirschberg further noted that the young, shortly after emerging from the egg sac, are already capable of overcoming ants several times their size. The small, white egg sac of *E. acuminata*, approximately 3 mm in diameter, is a sub-spherical structure laid on a twig. A female was observed holding it while feeding on an ant. The 22 eggs inside were each about 0.4 mm in diameter. Levi (1954: 7) reports finding *Euryopsis* egg sacs under stones; an American *E. scriptipes* formed an egg sac with about 16 eggs. Holm (1940) reports 14 eggs for *E. flavomaculata*; according to Hirschberg (1969) eclosion of the young of this species occurs 26 days after egg-laying.

Euryopsis species are distributed world wide. About 25 are known at present from the Americas, but the distinction of several species in the United States is not yet satisfactory (Levi & Randolph, 1975). Fewer than a dozen species are reported from central and mainly southern Europe, but only a few of these have been recorded again since their first description. Few species are described from Africa, Asia and Australia. Most of these are known solely from the old descriptions of only one sex. Better known species show considerable variation in colour and often also in prosoma shape. Certain species are known at present to have a wide range: *E. sauvea* described from northern United States occurs also in Czechoslovakia (Miller, 1971); *E. flavomaculata* ranges from Europe to Japan (Yaginuma, 1977); *E. acuminata* occurs throughout the Mediterranean countries. A study of Old World *Euryopsis* types along with fresh material would certainly disclose many synonyms, as we experienced with the local species.

Theridion inscriptum Cambridge, 1872, p. 284, from the Lebanon, listed commonly as *Euryopsis inscripta*, is an immature female of *Dipoena* (HECO, B. 588, t. 18; examined). Being a juvenile of an

unrecognisable species, it should be designated *nomen dubium*.

Key to the species of *Euryopsis* in Israel

1. Opisthosoma brown to black, sometimes with an indistinct, light pattern on back (Fig. 6)
 - *E. acuminata* (Lucas)
 - Opisthosoma black with a series of distinct white, silvery spots on back (Fig. 13).....2
2. Tip of conductor (C) of male palpal organ accompanies tip of embolus (E), both extending to about the same height (Fig. 16); female with a distinct, sclerotised, shield-shaped epigynal plate (Fig. 18)
 - *E. sexalbomaculata* (Lucas)
 - Tip of conductor of male palpal organ recurves on itself, turning away from embolar tip (Fig. 21); female unknown..... *E. hebraea* sp. n.

Euryopsis acuminata (Lucas, 1846) (Figs. 1-10)

Theridion acuminatum Lucas, 1846: 268, pl. 17, fig. 10, types from Algeria cannot be traced with certainty, presumably among specimens det. E. Simon (MNHN): Cambridge, 1872: 281, adult ♀ from Jericho, Israel (HECO, B. 588, t. 16A; examined). *Euryopsis acuminata*: Simon, 1873: 117 (footnote), adult ♂♂, ♀♀ from southern France, det. E. Simon (MNHN, B. 760, t. 2220; examined); Cambridge, 1876: 569, adult ♀ from Alexandria, Egypt (HECO, B. 587, t. 9; examined); Strand, 1914: 185, adult ♀ from Jaffa-Rehoboth, Israel, 25 August 1913, leg. J. Aharoni (SMF 3085; examined); Roewer, 1942: 450 (as *E. episinoides*); Bonnet, 1956: 1819; Kritscher, 1968: 279 (as *E. episinoides*); Soyer, 1973: 114.

Theridion scriptum Cambridge, 1872: 283, types 4 adult ♂♂ and 3 adult ♀♀ from the Plains of the Jordan, Israel (HECO, B. 588, t. 16; examined). *Euryopsis scripta*: Cambridge, 1876: 569, 2 adult ♀♀ from Alexandria, Egypt (HECO, B. 587, t. 7; examined); Roewer, 1942: 452; Bonnet, 1956: 1827. NEW SYNONYMY.

Euryopsis tarsalis Pavesi, 1875: 119, type ♀ from Capri, Italy, depository unknown; Brignoli, 1967: 189, fig. 9; 1968 a: 95, figs. 9 & 10; 1968 b: 261. *Euryopsis acuminata tarsalis*: Simon, 1914: 248, 292, adult ♂♂, ♀♀ from southern France, det. E. Simon (MNHN, B. 760, t. 2213; examined); Roewer, 1942: 450 (as *E. episinoides tarsalis*); Miller, 1947: 35, pl. 4, fig. 6; Bonnet, 1956: 1820; Miller, 1963: 343, pl. 1, figs. 1-3; 1971: 183, pl. 31, fig. 6. Validity of subspecies here doubted (see Comments).

Euryopsis quadrimaculata Cambridge, 1876: 569, types, adult ♂, ♀ from Alexandria, Egypt (HECO, B. 587, t. 8; examined); Roewer, 1942: 452; Bonnet, 1956: 1826. NEW SYNONYMY.

Male

Measurements (1 ♂): Carapace length 0.58, width 0.53, height 0.33; clypeus height 0.21; clypeus index 3.0.

Palpus: Very small (Figs. 33, 34). Fine, slightly undulating tips of conductor (C) and radix (R) placed close to each other; cone-shaped median apophysis (M), differs distinctly in form from pointed radix (Figs. 33, 34).

Female

Measurements (1 ♀): total length 2.9; carapace length 0.80, width 0.74, height 0.45; clypeus height 0.26; clypeus index 2.89; leg I, length: femur 1.0, patella + tibia 1.09, metatarsus 0.70, tarsus 0.36; leg IV, length: femur 0.90, patella + tibia 0.95, metatarsus 0.63, tarsus 0.34.

Epigynum: Very small; details of structure placed close to epigastric furrow and hardly visible; structure in form of a fine, small, semi-circular sclerotisation supported on each side by a dark, arched band (Fig. 35). Internal spermathecal organs consist of a pair of large compact bodies connected by short, straight ducts to a pair of small, oval bodies (Fig. 36).

Diagnosis

Dipoena braccata differs from other *Dipoena* species in the form and arrangement of the palpal structures, the shape of the carapace and the very minute size of the male. The female differs in the form of the internal genitalia.

Distribution

Central and southern Europe, North Africa; Israel — new record.

Records

Israel: Jerusalem (male; May), spring of Husan, Judean Hills (female, on *Adiantum* ferns; May).

Dipoena galilaea sp. n. (Figs. 37-42)

Holotype: Adult female from Nahal Bezet, northern Galilee (co-ordinates: 171/275), Israel, 3 August 1966, leg. S. Blondheim (HUJ 13117).

Coloration: Carapace brown, mottled with black markings (Fig. 37). Legs yellow but slightly darker

at distal articulations. Opisthosoma black with a distinct white pattern dorsally (Figs. 38, 39, 40).

Measurements (♀ holotype and 2 ♀♀; holotype listed first, range of others follows): total length 1.75, 2.1; carapace length 0.72, 0.75-0.80, width 0.68, 0.64-0.70, height 0.36, 0.40; clypeus height 0.21, 0.20-0.21; clypeus index 2.63, 2.50-2.63; leg I, length: femur 0.78, 0.72-0.80, patella + tibia 0.83, 0.80-0.84, metatarsus 0.58, 0.52-0.53, tarsus 0.30, 0.28-0.30; leg IV, length: femur 0.72, 0.68-0.70, patella + tibia 0.77, 0.77-0.80, metatarsus 0.55, 0.50-0.58, tarsus 0.30, 0.28-0.30.

Epigynum: Holotype; epigynal plate with two, fine sclerotised shallow cups, placed close to epigastric furrow (Fig. 41). Spermathecal orifices, above cups, partly surrounded by dark, winding band (Fig. 41). Internal organs partly visible through integument. Of the two pairs of spermathecal bodies, one pair is rather large, elongated and partly constricted apically (Fig. 42).

Diagnosis

Based on female. *Dipoena galilaea* differs distinctly from other *Dipoena* species in the form of the internal, elongated pair of spermathecal organs (Fig. 42) combined with the opisthosomal pattern (Fig. 39). Male unknown.

Distribution

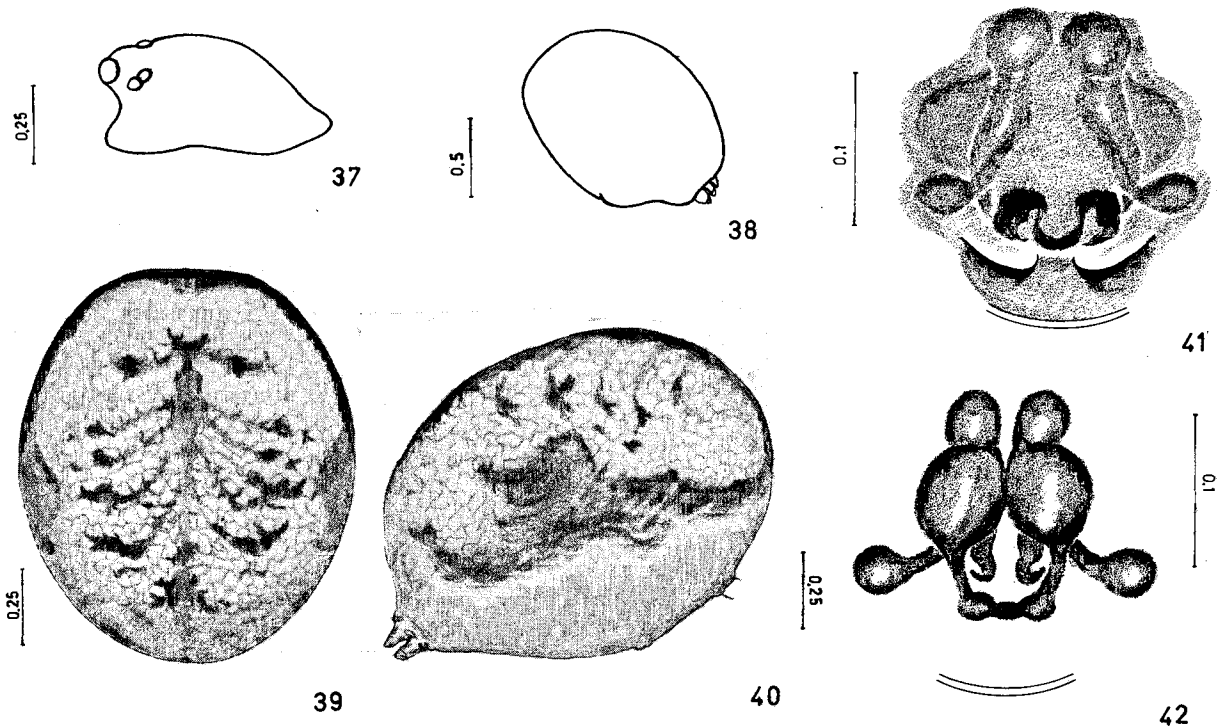
Israel: Hanita, Nahal Bezet near Elon — both localities are in northern Galilee.

Comments

All three adult females were collected in August, in moist places with dense vegetation. The holotype, from Nahal Bezet, was found with an egg sac containing five oval eggs, each about 0.6-0.7 mm in diameter.

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Figs. 37-42: *Dipoena galilaea* sp. n., ♀. 37 Carapace, holotype, lateral view; 38 Opisthosoma, lateral view (outline); 39 Opisthosoma, dorsal view; 40 Opisthosoma, lateral view; 41 Holotype, epigynum; 42 Holotype, spermathecae, dorsal (inner) view.

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References

- BERLAND, L. 1933: Contributions à l'étude de la biologie des Arachnides (3^e Mémoire). *Archs Zool.exp.gén.* 76 (Notes et Revue 1): 1-23.
- BONNET, P. 1956: *Bibliographia Araneorum* 2(2): 919-1926. Toulouse, Douladoure.
- BRIGNOLI, P. M. 1967: Notizie sui Theridiidae del Lazio (Araneae). *Fragm.ent.* 4(10): 177-197.
- BRIGNOLI, P. M. 1968a: Su alcuni Araneidae e Theridiidae di Sicilia (Araneae). *Atti Accad.gioenia Sci.nat.* (6) 20: 85-104.
- BRIGNOLI, P. M. 1968b: Notizie sui Theridiidae della Calabria. *Memorie Mus. civ. Stor. nat. Verona* 16: 261-269.
- CAMBRIDGE, O. P.- 1872: General list of the spiders of Palestine and Syria. *Proc.zool.Soc.Lond.* 1872: 212-354.
- CAMBRIDGE, O. P.- 1876: Catalogue of a collection of spiders made in Egypt. *Proc.zool.Soc.Lond.* 1876: 541-630.
- HIRSCHBERG, D. 1969: Beiträge zur Biologie, insbesondere zur Brutpflege einiger Theridiiden. *Z.wiss.Zool.* 179: 189-252.
- HOLM, Å. 1940: Studien über die Entwicklung und Entwicklungsbiologie der Spinnen. *Zool.Bidr.Upps.* 19: 1-214.
- KOCH, C. L. 1841: *Die Arachniden* 8: 1-131. Nürnberg.
- KRITSCHER, E. 1968: Ein Beitrag zur Kenntnis der Araneenfauna italiens. *Memorie Mus.civ.Stor.nat.Verona* 16: 271-320.

- LEVI, H. W. 1953a: New and rare *Dipoena* from Mexico and Central America (Araneae, Theridiidae). *Am.Mus. Novit.* **1639**: 1-11.
- LEVI, H. W. 1953b: Spiders of the genus *Dipoena* from America north of Mexico (Araneae, Theridiidae). *Am.Mus.Novit.* **1647**: 1-39.
- LEVI, H. W. 1954: Spiders of the genus *Euryopsis* from North and Central America (Araneae, Theridiidae). *Am.Mus.Novit.* **1666**: 1-48.
- LEVI, H. W. 1963: American spiders of the genera *Audifia*, *Euryopsis* and *Dipoena* (Araneae: Theridiidae). *Bull. Mus.comp.Zool.Harv.* **129**(2): 121-185.
- LEVI, H. W. & LEVI, L. R. 1962: The genera of the spider family Theridiidae. *Bull.Mus.comp.Zool.Harv.* **127**(1): 1-71.
- LEVI, H. W. & RANDOLPH, D. E. 1975: A key and checklist of American spiders of the family Theridiidae north of Mexico (Araneae). *J.Arachnol.* **3**: 31-51.
- LUCAS, H. 1846: Histoire naturelle des animaux articulés. In *Exploration scientifique de l'Algérie*, Zoologie **1** (Aranéides): 89-321. Paris.
- MENGE, A. 1868: Preussische Spinnen **2**. *Schr.naturf.Ges. Danzig* (N.F.) **2**: 153-218.
- MILLER, F. 1947: Pavouči zvířena hadcovýc stepi u Mohelna. *Arch. Svazu Vyzk. ochr. prirod. kraj. zem. Morav.* **7**: 1-107.
- MILLER, F. 1963: Tschechoslowakische Spinnenarten der Gattung *Euryopsis* Menge (Araneae, Theridiidae). *Čas.žsl.Spol.ent.* **60**: 341-348.
- MILLER, F. 1967: Studien über die Kopulationsorgane der Spinnengattung *Zelotes*, *Micaria*, *Robertus* und *Dipoena* nebst Beschreibung einiger neuen oder unvollkommen bekannten Spinnenarten. *Přirodov.Pr.Česk. Akad.Věd.* (N.S) **1**: 251-298.
- MILLER, F. 1971: Pavouci – Araneida, in Daniel, M. & Cerny, V. (eds), *Klíč Zvířeny ČSSR* **4**: 51-306. Praha.
- PAVESI, P. 1875: Note araneologique. I.Catalogo dei Ragni di Capri. *Atti Soc.ital.Sci.nat.* **18**: 113-130.
- ROEWER, C. F. 1942: *Katalog der Araneae* **1**: 1-1040. Bremen.
- SIMON, E. 1873: Aranéides nouveaux ou peu connus du midi de l'Europe. *Mém.Soc.r.Sci.Liège* (2) **5**: 1-174.
- SIMON, E. 1881: *Les Arachnides de France* **5**(1): 1-179. Paris.
- SIMON, E. 1894: *Histoire naturelle des araignées* **1**(3): 489-760. Paris.
- SIMON, E. 1914: *Les Arachnides de France* **6**(1): 1-308. Paris.
- SOYER, B. 1973: Contribution à l'étude éthologique et écologique des araignées de la Provence Occidentale. *Bull.Soc.linn.Provence* **26**: 113-121.
- STRAND, E. 1914: Zweite Mitteilung über Spinnen aus Palästina, gesammelt von Herrn Dr J. Aharoni. *Arch. Naturgesch.* **80A**(3): 173-186.
- THORELL, T. 1869: On European spiders. *Nova Acta R.Soc. Scient.Upsal.* (3)**7**: 1-108.
- WIEHLE, H. 1937: Spinnentiere oder Arachnoidea, VIII. 26. Familie: Theridiidae oder Haubennetzspinnen (Kugelspinnen). *Tierwelt Dtl.* **33**: 119-222.
- YAGINUMA, T. 1977: A list of Japanese spiders (revised in 1977). *Acta arachn.Tokyo* **27**: 367-406.