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The Deep Sea Levantine Fauna. — New Records and Rare Occurrences

With 4 Text-Figures and 1 Table

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Abstract

[GALIL, B. S. & GOREN, M. (1994): The deep sea Levantine fauna. — New records and rare occurrences. — *Senckenbergiana marit.*, 25 (1/3): 41–52, 4 figs., 1 Tab.; Frankfurt a. M.]

A series of twelve cruises conducted between 1988 and 1991 to study the bathyal off the coast of Israel brought up a wealth of new data. The present work adds nine new records for the Levant basin — the crustaceans *Eryoneicus kempfi*, *Munidopsis marionis*, *Bathynectes maravigna*, *Geryon longipes*; the echiurids *Echiurus abyssalis* and *Bonellia viridis*; the shark *Etmopterus spinax* and the fish *Coelorhynchus labiatus* and *Nezumia sclerorhynchus* — and extends the distribution of eighteen more species to the easternmost boundary of the Mediterranean. It is suggested that the extreme poverty of the deep Levantine fauna is due, in part, to recurrence of anoxic conditions at bathyal depths during the the Quaternary.

Kurzfassung

[GALIL, B. S. & GOREN, M. (1994): Die Tiefseefauna der Levante. — Neue Funde und seltene Vorkommen. — *Senckenbergiana marit.*, 25 (1/3): 41–52, 4 figs., 1 Tab.; Frankfurt a. M.]

Eine Anzahl von marinen Expeditionen zur Untersuchen der Bathyalfauna vor der israelischen Küste in den Jahren 1988–1991 erbrachten eine große Zahl neuer Daten. In der vorliegenden Arbeit werden 9 Arten zum ersten Mal für das Levantische Becken gemeldet: die Crustaceen *Eryoneicus kempfi*, *Munidopsis marionis*, *Bathynectes maravigna*, *Geryon longipes*; die Echiuriden *Echiurus abyssalis* und *Bonellia viridis*; der Hai *Etmopterus spinax* sowie die Knochenfische *Coelorhynchus labiatus* und *Nezumia sclerorhynchus*. Für weitere 18 Arten wird das bekannte Verbreitungsgebiet bis an das östliche Ende des Mittelmeeres ausgedehnt. Die extreme Armut der levantinischen Tiefseefauna wird, wenigstens teilweise, auf das Vorkommen anoxischer Verhältnisse in bathyalen Tiefen während des Quartärs zurückgeführt.

Introduction

The Levant basin is the easternmost part of the Mediterranean Sea, east of the line connecting Rhodes, Crete and the coast of Cyrenaica. It is isolated from the deep Atlantic waters by the topographical and hydrological barriers posed by the shallow Gibraltar Straits and the Sicilian-Tunisian sill. The Levantine deep waters are distinguished by severe oligotrophy, salinity and temperature values that are higher

than in the rest of the Mediterranean (FREDJ & LAUBIER, 1985). Faunistic explorations of the Levant bathyal commenced with the voyages of the "POLA" one hundred years ago (1890–1893), the most extensive deep-sea expedition to take place in the Levant basin. The Danish Oceanographical Expedition to the Mediterranean, aboard the Research Steamer "THOR", sampled nine sites along

the western limits of the Levant, from Cyrenaica to Rhodes, in 1910. The Lamont Geological Observatory research vessel "VEMA" collected plankton samples in July–August of 1956. During a ten-day sojourn in the Levant on January 1987, the "METEOR" [Cruise 5] obtained

deep-sea biota from the region between Crete, Cyprus and Israel. These few expeditions prompted FREDJ & LAUBIER (1985), in their seminal work on the deep Mediterranean benthos, to declare that "the Levant Sea has practically never been studied".

Materials and Methods

The area investigated is located off the northern coast of Israel, at depths between 200 and 1500 m (Fig. 1). Specimens used for this study were collected using a 2 m wide beam trawl, during twelve IOLR cruises, conducted between November 1988 and December 1991 (Table 1). Four cruises (II, V, IX and XII) sampled area A (between 33°00'N 34°37'E and 3°01'N 34°37'E), 50 km NW of Haifa, at depths of 1240–1450 m; four cruises (I, VII, X, XI) sampled area B (between 32°38'N 34°02'E and 32°36'N 34°16'E), at depths of 1370–1500 m; three cruises (III, IV, VIII) sampled area C (between 32°53'N

34°10'E and 32°51'N 34°23'E), at depths of 1420–1530 m, and one cruise (VI) sampled three sites along a transect at 200, 500, and 1000 m. Material is deposited in the Zoological Collection, Tel Aviv University (TAU), the Israel Oceanographic and Limnological Research (IOLR), and the Natural History Museum, London (NHM).

Table 1. Collections sites: List of cruises, dates, locations and depths.

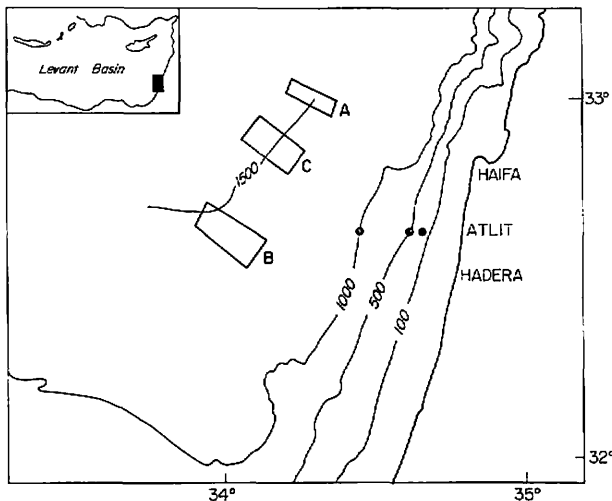


Fig. 1. Location of sampling sites off the Israeli coast.

Cruise	Date	Location	Depth(m)
I	15 - 17 Nov 1988	off Hadera	1370 - 1500
II	2 - 3 Jan 1989	off Haifa	1240 - 1450
III	23 May 1989	off Atlit	1440
IV	13 - 15 June 1989	off Atlit	1422 - 1527
V	30 - 31 Oct 1989	off Haifa	1240 - 1450
VI	30 Jan 1990	off Atlit	200, 500, 1000
VII	1 - 3 May 1990	off Hadera	1370 - 1500
VIII	4 - 5 June 1990	off Atlit	1400 - 1550
IX	4 - 6 Nov 1990	off Haifa	1240 - 1450
X	8 May 1991	off Hadera	1370 - 1500
XI	20 - 22 May 1991	off Hadera	1370 - 1500

Species List

Crustacea, Decapoda

Penaeidae

Gennadas elegans (SMITH, 1882)

- 1923 *Gennadas elegans*, — STEPHENSEN, Rept. da. oceanogr. Exped. Medit., 2(D3): 7.
 1958 *Gennadas elegans*, — HOLTHUIS & GOTTLIEB, Bull. Res. Counc. Israel, 7B: 111.
 1977 *Gennadas elegans*, — CASANOVA & JUDKINS, Rapp. Comm. intern. Mer Medit., 24: 126.

Material examined: Off Haifa, 3.1.1989, 1450 m, 1 sp., IOLR. Off Atlit, 23.5.1989, 1440 m, 2 sp., TAU AR 27343; 14.6.1989, 1470 m, 1 sp., TAU AR 27339; 4.6.1990, 1426 m, 1 sp., IOLR; 1480 m, 1 sp., TAU AR 27304. Off Hadera, 16.11. 1988, 1470 m, 1 sp., TAU AR 27048; 17.11.1988, 1420 m, 1 sp., TAU AR 27047; 1 sp., TAU AR 27046; 14 sp., TAU AR 27049; 1.5.1990, 1450 m, 1 sp., TAU AR 27311; 2.5.1990, 1420 m, 3 sp., TAU AR 27312; 8.5.1990, 1466 m, 1 sp., IOLR.

Distribution: Mediterranean, western Atlantic from New York to Florida, eastern Atlantic from Bay of Biscay to the Canaries and Cape Verde Islands, Sargasso Sea

and the south Atlantic, at depths of 400 to 3000 m (ZARIQUIEY ALVAREZ, 1968). Previous Levantine records were from east of Rhodes, 35°59'N 28°14'E and north of Egypt, 32°31'N 26°51'E (STEPHENSON, 1923). First record off the Israeli coast.

Aristeus antennatus (Risso, 1816)

- 1953 *Aristeus antennatus*, — GOTTLIEB, Bull. Res. coun. Israel, 2: 440–441.
 1958 *Aristeus antennatus*, — HOLTHUIS & GOTTLIEB, Bull. Res. Counc. Israel, 7B: 111.
 1969 *Aristeus antennatus*, — DEMETROPOULOS & NEOCLEOUS, Fisheries Bull. Cyprus, 1: 17.
 1986 *Aristeus antennatus*, — LEWINSON & HOLTHUIS, Zool. Meded., 40(8): 7.

Material examined: Off Haifa, 2.1.1989, 1424 m, 2 sp., IOLR; 4–6.11.1990, 1327 m, 1 sp., TAU AR 27286; 1356 m, 2 sp., TAU AR 27293; 1330 m, 2 sp., IOLR; 18.12.1991, 1335 m, 1 sp., TAU AR 27389; Off Atlit, 23.5.1989, 1440 m, 7 sp., TAU AR 27332; 30.1.1990, 1000 m, 6 sp., TAU AR 27301; 14.6.1989, 1527 m, 14 sp., TAU 27325; 4.6.1990, 1480 m, 2 sp., TAU AR 27280. Off Hadera, 20.5.1991, 1362 m, 2 sp., IOLR; 21.5.1991, 1450 m, 1 sp., IOLR; 21.5.1991, 1450 m, 1 sp., IOLR.

Distribution: Mediterranean, eastern Atlantic from Portugal to Cape Verde Islands (ZARIQUIEY ALVAREZ, 1968), Indian Ocean (CROSNIER & FOREST, 1973), at depths of 200–1440 m. Reported off the Israeli coast by GOTTLIEB (1953) and HOLTHUIS & GOTTLIEB (1958). Ubiquitous in our samples.

Sergestidae

Sergestes (Sergia) robustus SMITH, 1882

- 1898 *Sergestes robustus*, — ADENSAMER, Denkschr. Akad. Wiss. Wien, 65 (Ber. Comm. Erforsch. östl. Mittelm.): 626.
 1958 *Sergestes robustus*, — HOLTHUIS & GOTTLIEB, Bull. Res. Counc. Israel, 7B: 111.
 1961 *Sergestes robustus*, — BACESCU & MAYER, Rapp. Comm. intern. Mer Médit., 16(2): 192.
 1977 *Sergestes robustus*, — CASANOVA & JUDKINS, Rapp. Comm. intern. Mer Médit., 24: 126.

Material examined: Off Haifa, 3.1.1989, 1450 m, 1 sp., IOLR; 1345 m, 1 sp., IOLR; 31.10.1989, 1398 m, 2 sp., IOLR; 4–6.11.1990, 1435 m, 1 sp., TAU AR 27287; 1327 m, 1 sp., TAU AR 27288; 18.12.1991, 1230 m, 3 sp., TAU AR 27390. Off Atlit, 23.5.1989, 1440 m, 3 sp., TAU AR 27342; 14.6.1989, 1485 m, 1 sp., TAU AR 27327; 14.6.1989, 1470 m, 2 sp., TAU AR 27338. Off Hadera, 16.11.1988, 1470 m, 1 sp., TAU AR 27018; 17.11.1988, 1500 m, 3 sp., TAU AR 27019; 2.5.1990, 1420 m, 3 sp., TAU AR 27310; 21.5.1991, 1440 m, 1 sp., IOLR.

Distribution: Mediterranean, eastern Atlantic, from Norway and the Faeroes to Cape Verde Islands and Angola; western Atlantic, from Nova Scotia to the gulf of Mexico and the Antilles; at depths between 500 and 5000 m ZARIQUIEY ALVAREZ, 1968; CROSNIER & FOREST, 1973). Two previous reports from the Levant Basin: south of Crete, 35°8'N 24°4'E (ADENSAMER, 1898) and east of Crete, 35°00'30''N 27°49'30''E (BACESCU & MAYER, 1961). Frequently collected at all sites.

Sergestes henseni ORTMANN, 1893

- 1895 *Sergestes corniculum*, — KOENIG, Denkschr. Akad. Wiss. Wien, 62 (Ber. Comm. Erforsch. östl. Mittelm.): 13.
 1958 *Sergestes corniculum*, — HOLTHUIS & GOTTLIEB, Bull. Res. Counc. Israel, 7B: 13.

Material examined: Off Haifa, 3.1.1989, 1345 m, 1 sp., IOLR. Off Hadera, 17.11.1988, 1500 m, 1 sp., TAU AR 27044; 1470 m, 2 sp., TAU AR 27020.

Distribution: Mediterranean, temperate and tropical Atlantic at 300–2300 m (CROSNIER and FOREST, 1973). Its larval stages were reported to be abundant in the surface waters of the Levant basin „Sämtliche Thiere entstammen Oberflächenfängen zwischen 19°44' und 34°33'. Länge und 32°6' und 36°32' Breite“ (KOENIG, 1895). First record off the Israeli coast.

Sergestes sargassi ORTMANN, 1893

- 1977 *Sergestes sargassi*, — CASANOVA & JUDKINS, Rapp. Comm. intern. Mer Médit., 24: 126.

Material examined: Off Atlit, 14.6.1989, 1470 m, 1 sp., TAU AR 27341.

Distribution: Mediterranean, Atlantic from 45°N to 34°S (CROSNIER & FOREST, 1973). First record for the Israeli coast.

Oplophoridae

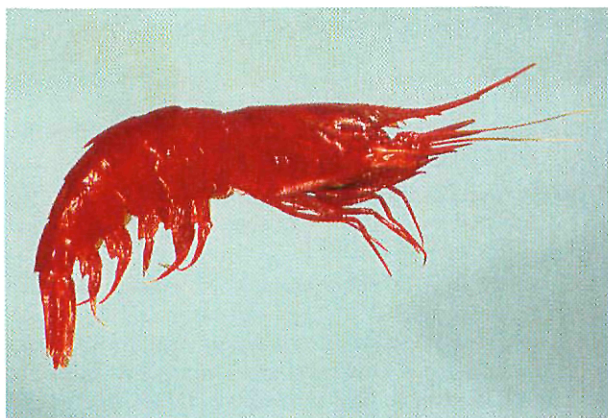
Acanthephyra eximia SMITH, 1884

(Fig. 2a)

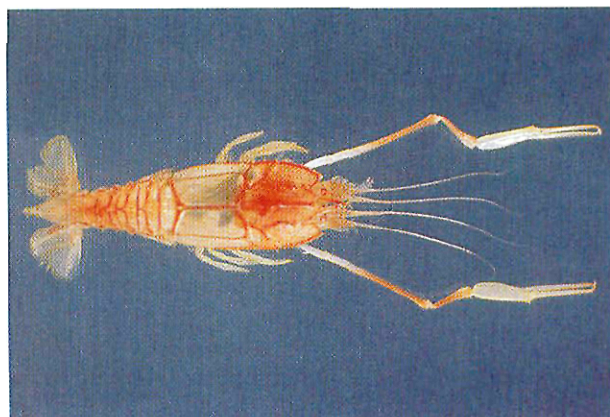
- 1898 *Acanthephyra pulchra*, — ADENSAMER, Denkschr. Akad. Wiss. Wien, 65 (Ber. Comm. Erforsch. östl. Mittelm.): 625.
 1958 *Acanthephyra eximia*, — HOLTHUIS & GOTTLIEB, Bull. Res. Counc. Israel, 7B: 112.
 1989 *Acanthephyra eximia*, — CHRISTIANSEN, Senckenbergiana marit., 20 (5/6): 187.

Material examined: Off Haifa, 30.10.1989, 1402 m, 1 sp., IOLR; 31.10.1989, 1441 m, 1 sp., IOLR; 4–6.11.1990, 1327 m, 3 sp., IOLR; 1356 m, 2 sp., TAU AR 27292; 1330 m, 1 sp., TAU AR 27295; 17.12.1991, 1400 m, 4 sp., TAU AR 27392; 18.12.1991, 1330 m, 2 sp., TAU AR 27391. Off Atlit, 23.5.1989, 1440 m, 1 sp., TAU AR 27334; 14.6.1989, 1470 m, 4 sp., TAU AR 27337; 14.6.1989, 1527 m, 12 sp., TAU AR 27322; 4.6.1990, 1426 m, 2 sp., TAU AR 27307. Off Hadera, 1.5.1990, 1450 m, 2 sp., TAU AR 27319; 21.5.1991, 1450 m, 1 sp., IOLR; 21.5.1991, 1440 m, 2 sp., TAU AR 27300.

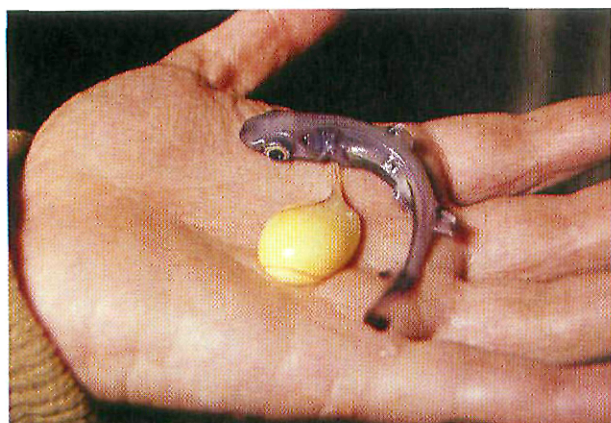
Distribution: Mediterranean, western Atlantic from North Carolina to Falkland Islands, eastern Atlantic from the Bay of Biscay to West Africa and the Azores, and the Indo West Pacific region, between 200 and 3700 m (SIVERTSEN & HOLTHUIS, 1956; CROSNIER & FOREST, 1973). Previous Levantine records: south of Crete, 34°45'N 24°23'E, 35°4'N 24°17'E (ADENSAMER, 1898), 34°27'N 26°15'E (CHRISTIANSEN, 1989); off Cyrenaica, 33°1'N 22°23'E and 33°4'N 21°16'E, north of Egypt, 31°39'N 28°52'E (ADENSAMER, 1898) and off the Israeli coast, 32°36'N 33°41'E (CHRISTIANSEN, 1989). Ubiquitous in our samples.



2a



2b



2c



2d

Fig. 2.—a. *Acanthbephyra eximia* SMITH, 1884; b. *Polycheles typhlops* HELLER, 1862; c. *Etmopterus spinax* (LINNAEUS, 1758); d. *Coelorbynchus labiatus* (KOEHLER, 1896).

Acanthbephyra pelagica (Risso, 1816)

- 1923 *Acanthbephyra multispina*, — STEPHENSEN, Rept. dan. oceanogr. Exped. Medit., 2(D3): 50.
 1958 *Acanthbephyra pelagica*, — HOLTHUIS & GOTTLIEB, Bull. Res. Counc. Israel, 7B: 112.
 1977 *Acanthbephyra pelagica*, — CASANOVA & JUDKINS, Rapp. Comm. intern. Mer Medit., 24: 126.
 1989 *Acanthbephyra pelagica*, — CHRISTIANSEN, Senckenbergiana marit., 20 (5/6): 187.

Material examined: Off Haifa, 3.1.1989, 1345 m, 1 sp., IOLR. Off Hadera, 17.11.1988, 1500 m, 1 sp., IOLR; 21.5.1991, 1408 m, 1 sp., TAU AR 27296.

Distribution: Mediterranean, northern Atlantic to about 13°S and south Atlantic, south of 24°S and in the southern Indian and Pacific oceans, between 32°S and 57°S (SIVERTSEN & HOLTHUIS, 1956; CROSNIER & FOREST, 1973) at depths of 350–3500 m. Previous Levantine records: off Turkey, 35°59'N 28°14'E (STEPHENSEN, 1923), south of Crete, 34°27'N 26°15'E and Off the Israeli coast, 32°36'N 33°41'E (CHRISTIANSEN, 1989).

Nematocarinidae

Nematocarinus ensifer (SMITH, 1882)

- 1898 *Nematocarinus ensiferus*, — ADENSAMER, Denkschr. Akad. Wiss. Wien, 65 (Ber. Comm. Erforsch. östl. Mittelm.): 625.
 1958 *Nematocarinus ensifer*, — HOLTHUIS & GOTTLIEB, Bull. Res. Counc. Israel, 7B: 112.

Material examined: Off Atlit, 13.6.1989, 1450 m, 1 sp., IOLR; 14.6.1989, 1470 m, 1 sp., TAU AR 27336; 1527 m, 10 sp., TAU AR 27330.

Distribution: Mediterranean, northern Atlantic, Indo Pacific region to the west coast of Central America, at depths between 535 and 3650 m (SIVERTSEN & HOLTHUIS, 1956; CROSNIER & FOREST, 1973). Previous Levantine records: south of Crete, 34°42'N 25°14'E; off Cyrenaica, 33°4'N 21°16'E (ADENSAMER, 1898). First record off the Israeli coast.

Pasiphaeidae

Pasiphaea multidentata ESMARK, 1866

- 1923 *Pasiphaea multidentata*, — STEPHENSEN, Rept. dan. oceanogr. Exped. Medit., 2(D3): 29.
 1958 *Pasiphaea multidentata*, — HOLTHUIS & GOTTLIEB, Bull. Res. Counc. Israel, 7B: 112.
 1977 *Pasiphaea multidentata*, — CASANOVA & JUDKINS, Rapp. Comm. intern. Mer Medit., 24: 126.

Material examined: Off Haifa, 30.10.1989, 1400 m, 1 sp., IOLR; off Atlit, 23.5.1989, 1440 m, 1 sp., TAU AR 27333. Off Hadera, 17.11.1988, 1500 m, 2 sp., TAU AR 27045; 21.5.1991, 1450 m, 1 sp., IOLR; 21.5.1991, 1440 m, 2 sp., TAU AR 27300.

Distribution: Mediterranean and North Atlantic, at depths of 10–2000 m (SIVERTSEN & HOLTHUIS, 1956; CROSNIER & FOREST, 1973). A single Levantine record, off Turkey, 35°59'N 28°14'E (STEPHENSEN, 1923). First record off the Israeli coast.

Pasiphaea sivado (RISSO, 1816)

- 1977 *Pasiphaea sivado*, — CASANOVA & JUDKINS, Rapp. Comm. intern. Mer Medit., 24: 126.

Material examined: Off Atlit, 14.6.1989, 1470 m, 2 sp., TAU AR 27328; 14.6.1989, 1527 m, 1 sp., TAU AR 27340.

Distribution: Mediterranean, northeast Atlantic and Indo West Pacific, at depths of 0–500 m (SIVERTSEN & HOLTHUIS, 1956; CROSNIER & FOREST, 1973). First record for the Israeli coast.

Pandalidae

Pleisionika heterocarpus (COSTA, 1871)

- 1964 *Pleisionika heterocarpus*, — LEWINSOHN & HOLTHUIS, Zool. Meded., 40(8): 53.

Material examined: Off Atlit, 30.1.1990, 200 m, 64 sp., TAU AR 27295.

Distribution: Mediterranean, Atlantic, from Portugal to Angola, Madeira and Canary Islands, at depths ranging from 35–680 m (ZARIQUIEY ALVAREZ, 1968; CROSNIER & FOREST, 1973). Previous Israeli record a single specimen.

Polychelidae

Eryoneicus kempfi SELBIE, 1914

Material examined: Off Atlit, 14.6.1989, 1527 m, 1 sp., TAU AR 27331.

Distribution: Mediterranean and eastern Atlantic, from Ireland to Cape Verde Islands, at depths down to 2800 m (STEPHENSEN, 1923; ZARIQUIEY ALVAREZ, 1968). First record from the Levant basin.

Polycheles typhlops HELLER, 1862

(Fig. 2b)

- 1891 *Polycheles typhlops*, — STEINDACHNER, Sitz.-Ber. Akad. Wiss. Wien, 100: 441.
 1898 *Polycheles typhlops*, — ADENSAMER, Denkschr. Akad. Wiss. Wien, 65(Ber. Comm. Erforsch. östl. Mittelm.): 621.
 1958 *Polycheles typhlops*, — HOLTHUIS & GOTTLIEB, Bull. Res. Counc. Israel, 7B: 114.
 1964 *Polycheles typhlops*, — LEWINSOHN & HOLTHUIS, Zool. Med.-ed., 40(8): 54.

Material examined: Off Haifa, 2.1.1989, 1450 m, 3 sp., IOLR; 30.10.1989, 1402 m, 1 sp., IOLR; 31.10.1989, 1398 m, 1 sp., IOLR; 4.–6.11.1990, 1330 m, 5 sp., TAU AR 27285; 1240 m, 7 sp., IOLR; 1356 m, 6 sp., TAU AR 27294; 1327 m, 1 sp., TAU AR 27284; 1435, 3sp., TAU AR 27283; 16.12.1991, 1440 m, 9 sp., TAU AR 27395; 17.12.1991, 1390 m, 10 sp., TAU AR 27393; 18.12.1991, 1230 m, 2 sp., TAU AR 27396; 1330 m, 8 sp., TAU AR 27394. Off Atlit, 23.5.1989, 1440 m, 8 sp., TAU AR 27324; 30.1.1990, 1000 m, 9 sp., TAU AR 27302; 13.6.1989, 1450 m, 2 sp., TAU AR 27335; 14.6.1989, 1470 m, 2 sp., TAU AR 27329; 1527 m, 8 sp., TAU AR 27321; 4.6.1990, 1426 m, 11 sp., TAU AR 27306; 1480 m, 4 sp., TAU AR 27305. Off Hadera, 1.5.1990, 1450 m, 2 sp., TAU AR 27320; 1425 m, 1 sp., TAU AR 27318; 2.5.1990, 1460 m, 1 sp., TAU AR 27309; 8.5.1991, 1466 m, 3 sp., IOLR; 1365 m, 3 sp., IOLR; 7.5.1991, 1455 m, 4 sp., IOLR; 20.5.1991, 1308 m, 4 sp., IOLR; 1362 m, 2 sp., IOLR; 1450 m, 2 sp., TAU AR 27299; 1450 m, 2 sp., IOLR; 1408 m, 3 sp., TAU AR 27282; 1450 m, 7 sp., IOLR.

Distribution: Mediterranean and eastern Atlantic, from Ireland to Cape Verde Islands, at depths of 300–2000 m (ZARIQUIEY ALVAREZ, 1968). Previous Levantine records: south of Crete, 34°46'N 24°23'E (STEINDACHNER, 1891), off southwest Turkey, 36°33'N 28°59'E; north of Egypt, 32°22'N 31°45'E (ADENSAMER, 1898); west of Alexandria, 31°39'N 28°51'E (STEINDACHNER, 1891); north of Cyrenaica, 33°56'N 22°56'E (ADENSAMER, 1898), north of Cyrenaica, 33°11'N 22°23'E (ADENSAMER, 1898). Previous Israeli record a single specimen.

Galatheidae

Munidopsis marionis (A. MILNE EDWARDS, 1882)

(Figs. 3, 4a–b)

- 1882 *Galatbodes marionis* — A. MILNE EDWARDS, Bull. hebd. Assoc. Sci. France, (2)4(95): 264.
 1882 *Galatbodes marionis*, — A. MILNE EDWARDS, Arch. Miss. sci., (3)9: 14.
 1894 *Orophorhynchus marionis*, — A. MILNE EDWARDS & BOUVIER, Ann. Sci. nat. Zool., (7)16: 198, 286–287, 325
 1900 *Orophorhynchus marionis*, — A. MILNE EDWARDS & BOUVIER, Exp. sci. Travailleur Talisman, 6: 340, pl. 31 figs 14–16.
 1940 *Munidopsis marionis*, — BOUVIER, Faune de France, 37: 175, pl. 6 fig. 5.
 1968 *Munidopsis marionis*, — ZARIQUIEY ALVAREZ, Invest. Pesq., 32: 269.
 1970 *Munidopsis marionis*, — CARPINE, Mém. Inst. océanogr. Monaco, 2: 54, 101, 134.
 1974 *Munidopsis marionis*, — FREDJ, Mém. Inst. océanogr. Monaco, 7: 34.

Material examined: Off Atlit, 30.1.1990, 1000 m, 1 sp., TAU AR 27313.

Description: Rostrum triangular, very slightly recurved, dorsally carinate, obtuse. Carapace longer than



Fig. 3. *Munidopsis marionis* (A. MILNE EDWARDS, 1882), carapace and abdomen — dorsal view.

broad, widest in posterior one-third. Dorsal surface of carapace granulate, lacking spines. Gastric region with pair of squat tubercles anteriorly and several indistinct protuberances behind. Cervical groove indistinct (fig. 3a). Anterior margin of carapace transverse, with distinct antennal spine. Anterolateral process incurved, robust, larger than lateral spines. Lateral margins weakly convex, with three blunt spines: two between anterior and posterior branches of cervical groove, one behind posterior branch. Posterior margin unarmed, hemmed by sinuous ridge. Abdominal segments spineless, 2nd and 3rd segments transversely furrowed. Eyes immovable, eyestalks short, barely visible beyond front, cornea prominent. Basal antennular article distally armed with two spines, each bearing accessory spinules (fig. 3b). Second antennal segment bearing a single spine distally. Merus of 3rd maxilliped bearing four spines on interior margin, proximal pair larger than distal pair. Ischium with 20 denticles on inner toothed ridge (fig. 3c). Chelipeds subequal, sparsely setose, tuberculate, shorter than first ambulatory legs. Merus with two denticles distally on inner margin. Carpus with two spines distally. Palm as long as dactylus. Dactylar tips hoof-shaped, dentate, teeth dovetail. Ambulatory legs relatively short, sparsely setose, tuberculate. Dactylus nearly straight, distally curved, posterior margin with 10 spines. Uropodal exopod dorsally smooth but for few granules externally, rounded margin with long pinnate setae.

Distribution: Known for nearly a century from a single specimen collected at 450 m at Planier Island, near Marseille (MILNE EDWARDS & BOUVIER, 1900). In the mid-sixties three more specimens were collected off Corsica (CARPINE, 1970). First record for the Levant basin.

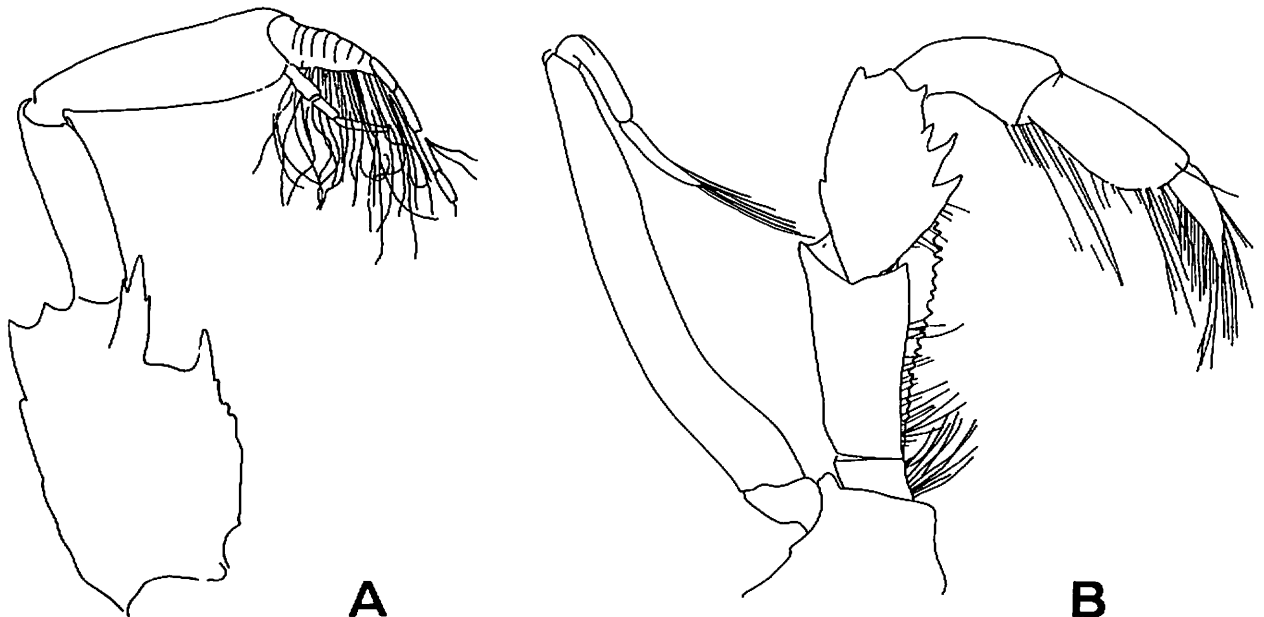


Fig. 4. *Munidopsis marionis* (A. MILNE EDWARDS, 1882) — a. right antennula $\times 50$; b. right third maxilliped $\times 50$

Axiidae

Calocaris macandreae BELL, 1846

Material examined: Off Atlit, 30.1.1990, 200 m, 1 sp., TAU AR 27317.

Distribution: Mediterranean, northeast Atlantic (ZARIQUIEY ALVAREZ, 1968), 50–1400 m (SELBIE, 1914). First record off the Israeli coast.

Portunidae

Bathynectes maravigna (PRESTANDREA, 1839)

Material examined: Off Atlit, 30.1.1990, 200 m, 1 sp., TAU AR 27308.

Distribution: Mediterranean and eastern Atlantic, from Norway and Faroe Islands to Morocco, Mauritania and the Azores, at depths down to 1455 m (MANNING & HOLTHUIS, 1981). First record from the Levant basin.

Geryonidae

Geryon longipes A. MILNE EDWARDS, 1882

Material examined: Off Haifa, 17.12.1991, 1400 m, 3 sp. TAU AR 27397; 18.12.1991, 1230 m 2 sp. TAU AR 27398; 1335 m, 4 sp. TAU AR 27399.

Distribution: Mediterranean, northeast Atlantic (MANNING & HOLTHUIS, 1987), at depths greater than 300 m (ZARIQUIEY ALVAREZ, 1968). First record from the Levant basin.

Majidae

Dorynchus thomsoni THOMSON, 1873

1898 *Lispognathus Thomsoni*, — ADENSAMER, Denkschr. Akad. Wiss. Wien, 65 (Ber. Comm. Erforsch. östl. Mittelm.): 615.
1958 *Dorynchus thomsoni*, — HOLTHUIS & GOTTLIEB, Bull. Res. Counc. Israel, 7B: 119.

Material examined: Off Atlit, 14.6.1989, 1527 m, 3 sp., TAU AR 27326.

Distribution: Mediterranean and eastern Atlantic, from Faeroes Islands to the Azores, at depths of 100–2000 m (ZARIQUIEY ALVAREZ, 1968). A single Levantine record, north of Cyrenaica, 33°56'N 22°56'E (ADENSAMER, 1898, as *Lispognathus thomsoni*). First record off the Israeli coast.

Amphipoda

Phrosinidae

Phrosina semilunata RISSO, 1822

1924 *Phrosina semilunata*, — STEPHENSEN, Rept. dan. oceanogr. Exped. Medit., 2(D4): 138, fig. 21.

Material examined: Off Hadera, 21.5.1991, 1450 m, 1 sp., TAU AR 27298; 1408 m, 1 sp., TAU AR 27297.

Distribution: Mediterranean, Atlantic from 40° N to Cape of good Hope and Indo-Pacific Ocean (STEPHENSEN, 1924). Previous records in the Levant: 33°11'N 21°44'E, 32°16'N 26°03'E, 34°23'N 27°57'E, 35°59'N 28°14'E (STEPHENSEN, 1924). First record off the Israeli coast.

Echiura

Echiuridae

Echiurus abyssalis SKORIKOW, 1906

Material examined: Off Haifa, 16.12.1991, 1440 m, 1 sp., TAU VR 25055; 18.12.1991, 1230 m, 1 sp., TAU VR 25056; 1330 m, 3 sp., TAU VR 25054.

Distribution: Mediterranean and Ireland (STEPHEN & EDMONDS, 1972). First record from the Levant basin.

Bonellidae

Bonellia viridis ROLANDO, 1821

Material examined: Off Haifa, 15.12.1991, 1000 m, 1 sp., TAU VR, 25057; 17.12.1991, 1390 m, 1 sp., TAU VR 25058.

Distribution: Mediterranean, Eastern Atlantic from Norway to Azores, and Red Sea (STEPHEN & EDMONDS, 1972). First record from the Levant basin.

Mollusca

Heteropoda, Pterotracheidae

Pterotrachaea coronata FORSKÅL, 1775

1898 *Pterotrachaea coronata*, — OBERWIMMER, Denkschr. Akad. Wiss. Wien, 63 (Ber. Comm. Erforsch. östl. Mittelm.): 586.
1971 *Firola coronata*, — LAKKIS, Mar. Biol, 11: 141.

Material examined: Off Atlit, 23.5.1989, 1440 m, 1 sp., TAU MO, 28414.

Distribution: circumtropical, including Mediterranean (VAN DER SPOEL, 1976). Previous Levantine records: west of Cyprus, 35°23'N 31°8'E (OBERWIMMER, 1898); Off Lebanon (LAKKIS, 1971). First record off the Israeli coast.

Cephalopoda, Enoploteuthidae

Pyroteuthis margaritifera (RÜPPELL, 1844)

1925 *Pyroteuthis margaritifera*, — DEGNER, Rept. dan. oceanogr. Exped. Medit., 2: 24, figs 15–18.

Material examined: Off Haifa, 18.12.1991, 1330 m, 1 sp., TAU MO, 27881. Off Atlit, 14.6.1989, 1470 m, 2 sp., TAU MO 28415.

Distribution: Circumglobal, tropical and temperate seas (MANGOLD & BOLETZKY, 1988). Previous records from the Levant basin: off Cyrenaica, 33°11'N 21°44'E and south of Rhodes, 35°59'N 28°14'E (DEGNER, 1925). First record off the Israeli coast.

Echinodermata

Holothuroidea, Synallactidae

Mesothuria (Allantis) intestinalis
(ASCANIUS & RATHKE, 1805)

- 1891 *Holothuria intestinalis*, — STEINDACHNER, Sitz.-Ber. Akad. Wiss. Wien, 100: 441, 442.
1893 *Holothuria intestinalis*, — MARENZELLER, Denkschr. Akad. Wiss. Wien, 60 (Ber. Comm. Erforsch. östl. Mittelm.): 15.

Material examined: Off Haifa, 2.1.1989, 1450 m, 1 sp., TAU EC 25302; 4–6.11.1990, 1327 m, 1 sp., TAU EC 25303; 1240 m, 1 sp., TAU EC 25304; 15.12.1991, 830 m, 1 sp., TAU EC 25323; 17.12.1991, 1400 m, 1 sp., TAU EC 25324; 18.12.1991, 1330 m, 1 sp., TAU EC 25325.

Distribution: Mediterranean, Atlantic, from Scandinavia and Faeroes Islands to the Azores and Africa (TORTONESE, 1965), 300–1445 m (TORTONESE, 1980). Previous Levantine records: south of Crete, 34°46'N 24°23'E, 35°11'N 23°41'E, 35°3'N 24°16'E (STEINDACHNER, 1891; MARENZELLER, 1893), south of Turkey, 36°13'N 30°22'E (MARENZELLER, 1893). First record off the Israeli coast.

Ascidiacea

Pyrosomidae

Pyrosoma atlanticum PERON, 1804

- 1891 *Pyrosoma giganteum*, — STEINDACHNER, SITZ.-BER. AKAD. WISS. WIEN, 100: 441.

Material examined: Off Atlit, 14.6.1989, 1485 m, 1 sp., TAU AS 25050. Off Hadera, 1.5.1990, 1450 m, 1 sp., TAU AS 25051; 21.5.1991, 1440 m, 1 sp., IOLR.

Distribution: Known from the western Mediterranean and the Adriatic (GODEAUX, 1976), but though reported by STEINDACHNER (1891), off the coast of Cyrenica (31°56'N 25°45'E), it was considered absent from the eastern Mediterranean (FURNESTIN, 1979; POR & DIMENTMAN 1989). GODEAUX (1976) wrote: "n'a jamais été signalé du secteur levantin"; though later (GODEAUX, 1990) reconsidered "Il est probable que cette espèce sera rencontrée plus à l'est en Méditerranée lors de prospections de la zone mesopelagique". First record off the Israeli coast.

Chondrichthyes

Squalidae

Etmopterus spinax (LINNAEUS, 1758)

- 1984 *Etmopterus spinax*, — McEACHRAN & BRANSTETTER, in: WHITEHEAD et al.: Fishes NE-Atl. Medit, 1: 141.
1984 *Etmopterus spinax*, — COMPAGNO, FAO Fisheries Synops., (125)4: 85.

Material examined: Off Haifa, 17.12.1991, 1400 m, 2 sp., IOLR; 18.12.1991, 1335 m, 2 sp., TAU 10381; 4 embryo, TAU 10384.

Distribution: Western Mediterranean, eastern Atlantic, from Norway to Senegal and southern Africa, from 70–2000 m (McEACHRAN & BRANSTETTER, 1984). First record from the eastern Mediterranean (COMPAGNO, 1984).

Osteichthyes

Chlorophthalmidae

Bathypterois mediterraneus BAUCHOT, 1962

(Fig. 2c)

- 1984 *Bathypterois mediterraneus*, — SULAK, in: WHITEHEAD ET AL.: FISHES NE-ATL. MEDIT, 1: 417, 418.
1987 *Bathypterois mediterraneus*, — FREDJ & MAURIN, Cymbium, 31(3): 267.
1988 *Bathypterois mediterraneus*, — PAPA-KONSTANTINOOU, Fauna Graeciae, 4: 54, 55.
1989 *Bathypterois mediterraneus*, — KLAUSEWITZ, Senckenbergiana marit., 20 (3/4): 255, 256.

Material examined: Off Haifa, 4.–6.11.1990, 1500 m, 1 sp. TL 125, TAU 10335. Off Hadera, 23.5.89, 1500 m, 2 sp. TL 44,53 TAU 10358; 1.5.1990, 1500 m, 2 ex. TL 102 (in second ex. SL 78 [tail broken]), TAU 10338; 14.6.89, 1485 m, 3 sp. TL 51–83, TAU 10339.

Distribution: Endemic to the Mediterranean. Recorded from western and central Mediterranean, at depths of 260–2800 m. (SULAK, in WHITEHEAD et al., 1984; 1984; FREDJ & MAURIN, 1987). Previous Levantine records: off Crete (PAPA-KONSTANTINOOU, 1988), and southwest of Cyprus (KLAUSEWITZ, 1989). First record off the Israeli coast.

Chlorophthalmus agassizii BONAPARTE, 1840

- 1971 *Chlorophthalmus agassizii*, — BEN TUVIA, Israel J. Zool., 20: 29. [List]
1984 *Chlorophthalmus agassizii*, — SULAK, in: WHITEHEAD ET AL.: FISHES NE-ATL. MEDIT, 1: 413.
1987 *Chlorophthalmus agassizii*, — FREDJ & MAURIN, Cymbium, 31(3): 267.
1988 *Chlorophthalmus agassizii*, — PAPA-KONSTANTINOOU, Fauna Graeciae, 4: 54.
1989 *Chlorophthalmus agassizii*, — KLAUSEWITZ, Senckenbergiana marit. 20 (3/4): 255.

Material examined: Off Atlit, 30.1.1990, 200 m, 1 sp. TL 67, TAU, 10342; 4 sp. TL 27–83, TAU 10343.

Distribution: Known from western and eastern Atlantic and the entire Mediterranean, found at depths of 50–1000 m. (SULAK, in WHITEHEAD et al., 1984).

Stomiidae

Stomias boa (RISSO, 1810)

- 1971 *Stomias boa*, — BEN TUVIA, Israel J. Zool., 20: 8, 28.
1984 *Stomias boa*, — GIBBS, in: WHITEHEAD et al.: Fishes NE-Atl. Medit, 1: 339, 340.
1987 *Stomias boa*, — FREDJ & MAURIN, Cymbium, 31(3): 267.

1988 *Stomias boa*, — PAPA-KONSTANTINOY, Fauna Graeciae, 4: 51, 52.

1989 *Stomias boa*, — KLAUSEWITZ, Senckebergiana marit., 20 (3/4): 254.

Material examined: Off Hadera, 32°37,5'N, 34°16.5'E, 1370 m, 1 sp., 17.11.88, IOLR

Distribution: Found in the Atlantic and Mediterranean at depths exceeding 1000 m. Previous Israeli record a single specimen (BEN TUVIA, 1971).

Nettastomatidae

Nettastoma melanura RAFINESQUE, 1810

1971 *Nettastoma melanurum*, — BEN TUVIA, Israel J. Zool., 20: 10, 29.

1986 *Nettastoma melanurum*, — SALDANHA, in: WHITEHEAD et al.: Fishes NE-Atl. Medit, 2: 562, 563.

1987 *Nettastoma melanurum*, — FREDJ & MAURIN, Cymbium, 31(3): 265.

1988 *Nettastoma melanurum*, — PAPA-KONSTANTINOY, Fauna Graeciae, 4: 64, 65.

Material examined: Off Haifa, 5.11.1990, 1500 m, 1 sp. TL 495, TAU, 10359. Off Hadera, 14.6.89, 1470 m, 1 sp. TL 32.0, TAU 10340.

Distribution: Recorded from the entire Atlantic, western Mediterranean and Greece (SALDANHA, 1984), at depths of 37–1647 m (SMITH et al., 1981). Previous Israeli record two specimens (BEN TUVIA, 1971).

Myctophidae

Diaphus bolti TANING, 1918

1984 *Diaphus bolti*, — HULLY, in: WHITEHEAD et al.: Fishes NE-Atl. Medit, 1: 445, 446.

1987 *Diaphus bolti*, — FREDJ & MAURIN, Cymbium, 31(3): 267.

1988 *Diaphus bolti*, — PAPA-KONSTANTINOY, Fauna Graeciae, 4: 56.

Material examined: Off Atlit, 31.1.1990, 1000 m, 1 sp. SL 55, TAU 10351; Off Hadera, 17.11.88, 1370 m, 2 sp. TL 15,20, TAU 10159.

Distribution: Recorded from the Atlantic and the Mediterranean (HULLY, in: WHITEHEAD et al., 1984), at depths below 1000 m (FREDJ & MAURIN, 1987). First record off the Israeli coast.

Electrona rissoi (COCCO, 1829)

1984 *Electrona rissoi*, — HULLY, in: WHITEHEAD et al.: Fishes NE-Atl. Medit, 1: 451, 452.

1987 *Electrona rissoi*, — FREDJ & MAURIN, Cymbium, 31(3): 268.

1988 *Electrona rissoi*, — PAPA-KONSTANTINOY, Fauna Graeciae, 4: 56.

Material examined: Off Hadera, 1485 m, 14.6.1989, 1 sp. SL 27, TAU, 10354.

Distribution: Widespread, known from depths up to 1000 m (HULLY, in: WHITEHEAD et al., 1984; FREDJ & MAURIN, 1987). First record off the Israeli coast.

Hygophum hygomii (LUTKEN, 1892)

1984 *Hygophum hygomii*, — HULLY, in: WHITEHEAD et al.: Fishes NE-Atl. Medit, 1: 454, 455.

1987 *Hygophum hygomii*, — FREDJ & MAURIN, Cymbium, 31(3): 268.

1988 *Hygophum hygomii*, — PAPA-KONSTANTINOY, Fauna Graeciae, 4: 57.

Material examined: Off Hadera, 17.11.88, 1370 m, 2 sp. TL 22,23, TAU 10159; 23.5.89, 1440 m, 1 sp. TL 45, TAU 10344; 14.6.89, 1485 m, 1 sp. SL 32 (tail broken), TAU 10353.

Distribution: Widespread, ubiquitous, known from depths down to 1000 m (HULLY, in: WHITEHEAD et al., 1984; FREDJ & MAURIN, 1987). First record off the Israeli coast.

Chauliodontidae

Chauliodes sloani SCHNEIDER, 1801

1971 *Chauliodes sloani*, — BEN TUVIA, Israel J. Zool., 20: 8, 28.

1984 *Chauliodes sloani*, — GIBBS, in: WHITEHEAD et al.: Fishes NE-Atl. Medit, 1: 337.

1987 *Chauliodes sloani*, — FREDJ & MAURIN, Cymbium, 31(3): 267.

1988 *Chauliodes sloani*, — PAPA-KONSTANTINOY, Fauna Graeciae, 4: 51.

Material examined: Off Hadera, 1.–2.5.90, 1500, 1 sp. SL 162.0, TAU, 10345; 17.11.88, 1370 m, 2 sp. TL 40,96, TAU 10158.

Distribution: Widespread, known from western Mediterranean (GIBBS, 1984), as well as from certain localities in eastern Mediterranean (BEN TUVIA, 1971; PAPA-KONSTANTINOY, 1988), at depths exceeding 1000 m (GIBBS, in: WHITEHEAD et al., 1984; FREDJ & MAURIN, 1987).

Sternoptychidae

Argyropelecus hemigymnus COCCO, 1829

1971 *Argyropelecus hemigymnus*, — BEN TUVIA, Israel J. Zool., 20: 28. [List]

1984 *Argyropelecus hemigymnus*, — BADCOCK, in: WHITEHEAD et al.: Fishes NE-Atl. Medit, 1: 301, 310.

1987 *Argyropelecus hemigymnus*, — FREDJ & MAURIN, Cymbium, 31(3): 267.

1988 *Argyropelecus hemigymnus*, — PAPA-KONSTANTINOY, Fauna Graeciae, 4: 50.

Material examined: Off Haifa, 30.10.89, 1400 m, 2 sp. SL 17–21, TL, 21–35, TAU 10350.

Distribution: Circumglobal, ubiquitous species. Common in the western Mediterranean and known from scattered records in the eastern part (BADCOCK, in: WHITEHEAD et al., 1984; BEN TUVIA, 1971; PAPA-KONSTANTINOY, 1988).

Macrouridae

Coelorhynchus coelorhynchus (RISSO, 1810)

1971 *Coelorhynchus coelorhynchus*, — BEN TUVIA, Israel J. Zool., 20: 30. [List]

- 1986 *Coelorhynchus coelorhynchus*, — GEISTDOERFER, in: WHITEHEAD et al.: Fishes NE-Atl. Medit, 2: 656.
 1987 *Coelorhynchus coelorhynchus*, — FREDJ & MAURIN, Cymbium, 31(3): 268.
 1988 *Coelorhynchus coelorhynchus*, — PAKONSTANTINO, Fauna Graeciae, 4: 75.
 1989 *Coelorhynchus coelorhynchus*, — KLAUSEWITZ, Senckenbergiana marit., 20 (3/4): 255.

Material examined: Off Hadera, 14.6.1989, 1485 m, 1 sp. SL 59, TL 67, TAU 10352; 17.11.88, 1370 m, 1 sp. TL 46, TAU 10162.

Distribution: Mediterranean and Atlantic, usually at depths shallower than 600 m (GEISTDOERFER, in: WHITEHEAD et al., 1986; FREDJ & MAURIN, 1987).

Coelorhynchus labiatus (KOEHLER, 1896)

(Fig. 2d)

- 1986 *Coelorhynchus occa*, — GEISTDOERFER, in: WHITEHEAD et al.: Fishes NE-Atl. Medit, 2: 656, 657.
 1987 *Coelorhynchus occa*, — FREDJ & MAURIN, Cymbium, 31(3): 268.

Material examined: Off Haifa, 17.12.1991, 1390 m, 1 sp., TAU 10380. Off Hadera, 1.–2.5.90, 1500 m, 1 sp. SL 235, TAU 10356.

Distribution: Atlantic, at depths of 580–2200 m (GEISTDOERFER, 1986). GEISTDOERFER (in: WHITEHEAD et al., 1986) did not list the species in the Mediterranean, while FREDJ & MAURIN (1987) listed it in the western Mediterranean. The present record is the first from the eastern Mediterranean and probably indicates a wider distribution.

Nezumia sclerorhynchus (VALENCIENNES, 1838)

- 1986 *Coelorhynchus sclerorhynchus*, — GEISTDOERFER, in: WHITEHEAD et al.: Fishes NE-Atl. Medit, 2: 671.
 1987 *Coelorhynchus sclerorhynchus*, — FREDJ & MAURIN, Cymbium, 31(3): 268.
 1988 *Coelorhynchus sclerorhynchus*, — PAKONSTANTINO, Fauna Graeciae, 4: 76.

Material examined: Off Haifa, 4.–6.11.1990, 1500 m, 4 sp. TL 140–154 (severely damaged); 16.12.1991, 1440 m, 1 sp.,

TAU 10378; 18.12.1991, 1230 m, 8 sp., 10379; 1330 m, 4 sp., 10383. Off Atlit, 30.1.90, 1500 m, 1 sp. SL 158 (tail broken), TAU 10341; 30.1.90, 500 m, 1 sp. TL 142; 30.1.90, 1000 m, 1 sp. TL 152.

Distribution: Mediterranean, Atlantic, at depths of 500–3200 m (GEISTDOERFER, in: WHITEHEAD et al., 1986; FREDJ & MAURIN, 1987). First record from the Levant basin.

Gonostomatidae

Cyclothone pygmaea JESPERSEN & TANING, 1926

- 1984 *Cyclothone pygmaea*, — BADCOCK, in: WHITEHEAD et al.: Fishes NE-Atl. Medit, 1: 294, 295.
 1987 *Cyclothone pygmaea*, — FREDJ & MAURIN, Cymbium, 31(3): 267.
 1988 *Cyclothone pygmaea*, — PAKONSTANTINO, Fauna Graeciae, 4: 47.

Material examined: Off Haifa, 30.10.89, 1400 m, 7 sp. SL 25–40, TAU 10347. Off Hadera, 17.11.88, 1370 m, 34 sp. TL 15–23, TAU 10157.

Distribution: A Mediterranean endemic, at depths below 500 m (BADCOCK, in: WHITEHEAD et al., 1984; FREDJ & MAURIN, 1987). First record off the Israeli coast.

Paralepididae

Paralepis speciosa BELLOTTI, 1878

- 1971 *Paralepis speciosa*, — BEN TUVIA, Israel J. Zool., 20: 29. [List]
 1984 *Paralepis speciosa*, — POST, in: WHITEHEAD et al.: Fishes NE-Atl. Medit, 1: 506, 507.
 1987 *Paralepis speciosa*, — FREDJ & MAURIN, Cymbium, 31(3): 267.
 1988 *Paralepis speciosa*, — PAKONSTANTINO, Fauna Graeciae, 4: 47.

Material examined: Off Hadera, 17.11.88, 1370 m, 2 sp. TL 35,74, TAU 10161.

Distribution: A Mediterranean endemic. Distributional information is sporadic and vertical distribution is uncertain (POST, in: WHITEHEAD et al., 1984; FREDJ & MAURIN, 1987).

Discussion

Compared with the Atlantic ocean, the depths of the Mediterranean Sea lack major taxonomic groups, as well as cold stenotherm species (FREDJ & LAUBIER, 1985). This qualitative and quantitative poverty of the deep Mediterranean is considered to result from the fauna's relatively recent entry from the Atlantic, the impediment posed by the shallow sill at Gibraltar, the sea's oligotrophy and high homothermy and the climatic fluctuations during the Quaternary. The present work adds nine species newly recorded from the Levant and extends the distribution of another eighteen species to the easternmost boundary of the Mediterranean. Yet, the poverty of the Levantine deep water fauna is clearly evident, it being the poorest in the

Mediterranean (FREDJ & LAUBIER, 1985). The prevalent low-diversity, low-density conditions are considered related to the basin's oligotrophy, its distance from the point of faunal entry at Gibraltar, and the shallow Siculo-Tunisian sill. BOUCHET & TAVIANI (1992) suggest that larval ecology is the main cause of the faunal sparsity, and that much of the Mediterranean deep-sea fauna is made up by non-reproducing pseudopopulations. However, gravid benthic decapod crustaceans and fish were collected from the depths of the Levantine basin.

The extreme poverty of the Levantine depths compared to the rest of the Mediterranean may be explained by its past. Multiple layers of sapropels were discovered in the

eastern Mediterranean (KULLENBERG, 1952), but were not recorded west of the Strait of Sicily (MALDONADO, 1985). Warming of the surface water together with large-volume flooding of fresh and low salinity water caused by deglaciation, resulted in restricted thermohaline convection, stagnation of subsurface water and deposition of sapropels at water depths greater than 600–1000 m (VERGNAUD-GRAZZINI et al., 1977; MUERDTER et al., 1984; HERMAN, 1989). The Levantine depths underwent faunal extinctions induced by environmental deterioration during interglacial stagnant episodes, followed by partial replenishment in glacial periods. We, thus, suggest that the poverty of the Levantine deep fauna results from it being doubly afflicted: during glacial periods the prevailing high temperature and salinity (HERMAN, 1989) prevented settlement by members of the stenothermic and stenohaline Atlantic bathyal, as far as they were able to cross the Gibraltar and Sicilian sills,

while anoxic conditions during the postglacial restricted recolonization. Thus, the Levant basin, with its recurrent stagnant events, the last one terminating only 6000 yrs B.P. (TROELSTRA et al., 1991), serves us with a unique opportunity to examine the process of faunal recolonization of its depths.

Acknowledgments

This research was financed by the Israel Electric Corporation LTD and Haifa Chemicals LTD, we gratefully acknowledge their generosity. We thank Dr. BISESWAR for his help in the identification of the echinurids. We thank Captain A. BEN-NUN and the crew of the R/V "SHIKMONA". Photographs by A. SHOUB, drawings by H. BERNARD.

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