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ADDITIONS TO THE KNOWLEDGE OF INDO-PACIFIC MOLLUSCA
IN THE MEDITERRANEAN

Riassunto

Questo è il secondo contributo degli autori relativamente alle specie indo-pacifiche di molluschi reperite in Mediterraneo. In esso vengono menzionate per la prima volta altre 9 specie di Gastropoda e 4 di Bivalvia. Inoltre si cita Chiton platei, primo rappresentante dei chitonidi dell’Indopacifico in Mediterraneo.

Vengono inoltre date ulteriori informazioni su 24 specie indo-pacifiche già segnalate precedentemente. Sono state trovate masse ovigere di Cerithium kochi, che attualmente è la specie più frequente lungo le coste mediterranee israeliane.

Si illustra infine la distribuzione delle 68 specie indo-pacifiche attualmente note per il Mediterraneo: la maggior parte di esse (59) è distribuita lungo le coste mediterranee di Israele e della penisola del Sinai.

Abstract

This is the authors’ second survey on Indo-Pacific species in the Mediterranean. 13 additional Indo-Pacific species found there are recorded for the first time (Gastropoda - 9, Bivalvia - 4).

Chiton platei is the first representative of Indo-Pacific chitonids in the Mediterranean.

Supplementary data were given for 24 Indo-Pacific species in the Mediterranean recorded previously. Egg masses were found of the Indo-Pacific Cerithium kochi, which is now the most abundant species in the Mediterranean waters of Israel.

A discussion is presented on the distribution of the 68 Indo-Pacific species known hitherto from the Mediterranean. The majority of them (59) are concentrated along the Mediterranean coast of Israel and Sinai Peninsula.
Introduction

The survey of Barash and Danin (1973) * on Indo-Pacific species of Mollusca in the Mediterranean, revealed that certain species, known to occur in the Indo-Pacific region, had become common or abundant in the Mediterranean, namely: Isanda cf. holdsworthiana, Cerithium kochi, Cerithium scabridum, Brachidontes variabilis. On the other hand, several species considered to be successful immigrants into the Mediterranean are probably rare or only locally common in this sea, e.g. Murex tribulus, Fusinus marmoratus.

It follows from this that observations on migrating Red Sea species should be continued for many years, in order to evaluate properly the rate of their settling in the new area, and to detect the appearance of new immigrants.

So far 53 species of Indo-Pacific Mollusca have been found in the Mediterranean since the opening of the Suez Canal. 49 species are reported in the summarizing publications of G. Haas (1948), Barash and Danin (1973) and Ghisotti (1974). Four additional Indo-Pacific species new to the Mediterranean were also recorded, namely: Chrysalidina maiae by Dr. J.J. Aartsen (1963) and Diala semistriata, Ventomnestia girardi, Cerithium nesioticum by Mr. H.K. Mienis (1976 b, 1976 e, 1977).

A favorable opportunity for further investigations of migration of Indo-Pacific Mollusca presented itself during the years 1974-1975. Intensive explorations of the Mediterranean fauna were carried out during that period by the Tel-Aviv University and the Hebrew University of Jerusalem.

Dr. Ch. Lewinsohn and M. Tom from the Tel-Aviv University made numerous dredgings in the infralittoral of Haifa Bay and opposite the Mediterranean coast of the Sinai Peninsula. Prof. A. Ben Tuvia of the Hebrew University of Jerusalem, performed a faunistic survey (mainly of fishes) in the shallow (1-3 m. deep) hypersaline lagoon of Bardawil (Mediterranean coast of the Sinai Peninsula situated in the immediate proximity of the Suez Canal). The molluscs collected by these investigators were passed to us for determination. The examination of this material and a revision of specimens not identified yet in the collections of Israel, resulted in the discovery of 13 Indo-Pacific species of Mollusca, new for the Mediterranean, for the first time recorded in the present paper. The identification of the new species was made or ascertained by the following persons:

POLYPLACOPHORA - Prof. E. Leloup, Institut Royal de Sciences Naturelles de Belgique.

PROSOBRANCHIA - Prof. W.O. Cernohorsky, Auckland Institute and Museum, New Zealand; Dr. F. Ghisotti, U.M.I., Milan; Dr. R.N. Kilburn, Natal Museum, South Africa; Mr. H.K. Mienis, Hebrew University, Jerusalem; Dr. H. Rehder, Smithsonian Institution, Washington; Dr. G. Spada, U.M.I. - Bologna (Italy).

* Dated 1972 but printed only in July 1973
OPISTHOBRANCHIA - Dr. J.J. van Aartsen - Dieren (Holland); Dr. Ph. Bouchet, Museum National d'Histoire Naturelle, Paris; Dr. H. Gantès, Université de Bordeaux.


The authors are very grateful to them and much appreciate their assistance and guidance.

Since the publication of our first survey (1973) on the Indo Pacific species immigrated into the Mediterranean, additional data were accumulated. These data, concerning a considerable number (24) of the species dealt with in the survey (1973), will also be given here.

The specimens referred to in the present report are mostly kept in the collections of the Tel-Aviv University.

The initials used for samples collected by Tel-Aviv University are NS; by Prof. Ben Tuvia, Hebrew University, Jerusalem - BFS; by the Sea Fisheries Research Station, Haifa - SFRS; the collection of the Hebrew University, Jerusalem - HUJ.

Notes on the species

Remarks:

1) Molluscs marked as « specimens » were collected alive, otherwise they are indicated as « shells » or « valves ».

2) Species marked by asterisks were formerly recorded in publications on Indo-Pacific species in the Mediterranean and the data on them are supplementary.

Class  POLYPLACOPHORA

Order  CHITONIDA

Family  Chitonidae

*Chiton platei* THIELE, 1910.

Fig. 1.

Briefly reported for the first time by Al. Barash in 1974.

Intertidal zone, on rocks - Akko, 5.XII.1934, one specimen (NS 7968); Caesarea, 8.XII.1971, one specimen (NS 7969).

Distribution

Red Sea: Eilat, Djibouti (Leloup, 1960: 38).
Class GASTROPODA
Subclass PROSOBRANCHIA
Order ARCHAEOGASTROPODA

Family Fissurellidae
* Diodora rueppelli (SOWERBY, 1834).

Material
Live: 1) Intertidal zone, rocky shore - Dor, 11.IX.1974, one specimen (NS 12815).
2) Dredged - Haifa Bay, 14.V.1974, 46 m., sandy bottom, one specimen (NS 12893); 17.IX.1975, 71 m., muddy sand, one specimen (NS 12894).
Shells: on the beach of Netanya, II.1974, 2 shells (NS 13103).

Family Trochidae
* Isanda cf. holdsworthiana (NEVILL, 1871).
Syn: Coralastelle emigrans NORDSIECK, 1972 - (NORDSIECK, 1972: 228 Fig. 5).

Material
Live: dredged - Haifa Bay: 10.VII.1974, 31 m., sandy mud, 15 specimens (NS 12895); 11.VII.1974, 40 m., muddy sand, 5 specimens (NS 12896); 29.VIII.1974, 31 m., sand, 39 specimens (NS 12897); 40 m., muddy sand, 2 specimens (NS 12898); 31.VIII.1974, 51 m., mud, 2 specimens (NS 12899); 25.XII.1974, 44 m., sandy mud, 1 specimen, (NS 12900); 25 m., sand, 2 specimens (NS 12901); 13.II.1975, 31 m., sandy mud, 1 specimen (NS 12902); 16.I.1975, 73 m., sand, 1 specimen (NS 12903); 11.V.1975, 32 m., sandy mud, 13 specimens (NS 12904); 17.IX.1975, 31 m., sand, 13 specimens (NS 12905); 46 m., muddy sand, 3 specimens (NS 12906); 25 m., sand, 917 specimens (NS 12907).
Off Bardawil: 31°35'N, 32°46'E, 31.X.1975, 46 m., sandy mud, 48 specimens (NS 12911); 31°23'N, 33°22'E, 2.XI.1975, 27 m., mud, 1 specimen (NS 12912); 31°28'N, 22°E, 62 m., mud, 1 specimen (NS 12913).
Shells: dredged - Haifa Bay: 14.V.1974, 68 m., mud, 1 shell (NS 12914); 26 m., sandy mud, 9 shells (NS 12915); 46 m., sand, 2 shells (NS 12916); 29.VIII.1974, 48 m., mud, 5 shells (NS 12917); 40 m., muddy sand, 3 shells (NS 12918); 51 m., mud, 11 shells (NS 12919); 24.XII.1974, 44 m., sandy mud, 8 shells (NS 12920); 25.XII.1974, 75 m., mud, 2 shells (NS 12921); 13.II.1975, 48 m., sandy mud, 5 shells (NS 12922); 16.II.1975, 73 m., mud, 4 shells (NS 12923); 29.IV.1975, 48 m., muddy sand, 1 shell (NS 12924); 65 m., mud, 4 shells (NS 12925); 11.V.1975, 68 m., mud, 7 shells (NS 12926); 17.IX.1975, 46 m., sandy mud, one shell (NS 12927); 71 m., mud, 1 shell (NS 12928).
Off Bardawil: 31.X.1975, 46 m., sandy mud, 7 shells (NS 12929); 1.XI.1975, 46 m., mud, 4 shells (NS 12930).

Remark
This species is now permanently common on the continental shelf of Israel, mainly at a depth of 20-50 m. Sand is the most frequent substrate on which this species is found, and to a lesser extent sandy mud.

In a recent published paper YARON (1977: 54) has correctly pointed out that the right name for this species should be Minolia nedyma MELVILL, 1897. A subsequent study of the radula by Dr. KILBURN (Natal) has confirmed its generic position (YARON, in litt.).
Family **Rissoidae**

*Alvania orbignyi* (AUDOUIN, 1827).

**Material**

Shells: on beaches - Shavé Zyyon, 16.X.1946, 4 shells (NS 12932); Bat Gallim, 13.II.1962, 5 shells (NS 12933); Shiqmona 8.VII.1968, 24 shells (NS 12934); 21.II.1971, 40 shells (NS 12935).

**Remark**

In our 1973 survey, the finding of a few shells of *Alvania orbignyi* was recorded, only on the beach of Shiqmona. Consequently, it was listed among the Indo-Pacific species whose appearance in the Mediterranean Sea is merely occasional. However, it turned out that *A. orbignyi* is fairly common on the Israeli coast and it may be regarded as resident in this area.

Family **Potamididae**

*Pirenella cailliaudi* (POTIEZ et MICHAUD, 1838).

**Fig. 2.**

**Material**


**Remark**

In the Bardawil Lagoon the Mediterranean species - *Pirenella conica* (BLAINVILLE, 1826) is also abundant. These two species are extremely variable in their sculpture. SMITH (1891) stated that « nearly all the Suez specimens of *Pirenella cailliaudi* have two distinct rows of granules on the upper whorls, whereas in Mediterranean specimens (of *P. conica*) there are mostly three or more, and in these the granules are smaller than in the Red Sea specimens ». But TOMLIN (1927: 296) after examining a great many examples collected at Lake Menzaleh and Kabret (Suez Canal), found it quite impossible to discriminate between *P. conica* and *P. cailliaudi*. « The Menzaleh gatherings include every possible variations of sculpture from spiral rows of granules down to forms with the spiral ridges obsolete and without any granulations at all ».

The question as to whether *P. cailliaudi* and *P. conica* should be united or should remain in their present status as two separate species, demands further investigation.
Dahlakia cf. leilae BIGGS, 1971.

Fig. 3.

A New Record for the Mediterranean

Material
Shells: Bardawil, on the beach: 23.X.1967, one shell (NS 12798); 1.IV.1974, 4 shells (NS 12799); 3.IX.1974, 6 shells (NS 12800).

Distribution
Red Sea: Dahlak Islands (BIGGS, 1971: 221).

Remark
The shells of this species from Bardawil were examined by Dr. Kilburn (Natal Museum, South Africa). In his opinion they possibly belong to Dahlakia leilae BIGGS, 1971, fig. 3. But the shells from Bardawil are considerably higher (8-10 mm) than those from Dahlak Archipelago - Entedebir (5.2 mm) described by BIGGS (1971).

In the opinion of Mr. MIENIS (by litt.), «these shells do not belong to Dahlakia leilae nor to any other Dahlakia. They are not only considerably higher but also much wider than any member of this rather controversial genus».

The orderly classing of the shells collected at Bardawil still has to be certified.

Family Diasomitidae (= Fineliidae)

Eufenella pupoides (A. ADAMS, 1860)

Fig. 4.

Syn: Fenella pupoides A. ADAMS, 1860 - (A. ADAMS, 1870: 122); Finella pupoides A. ADAMS (THIELE, 1931: 209, fig. 209).

A New Record for the Mediterranean.

Material
Shells: 1) on the beach of Atlit, 5.VIII.1958, 2 shells (NS 12801); 2) dredged - N.W. Akko, to a depth of 54 m., one shell (HUJ).

Distribution

Remark
Noteworthy is the contradiction between the original figure published in A. ADAMS (1868: plt. 4, fig. 5) and that given by THIELE (1931: fig. 209). According to the type in the collection of the Journal de Conchyliologie (MNHN, Paris) the latter is the correct one.

(*) A Red Sea species, Fenella cf. virgata (PHILIPPI) was found at Iskanderun (Turkey) by Dr. J.J. Aartsen (communication by letter of 15.I.1977). This Indo Pacific species should be added to the list of immigrants into the Mediterranean after the publication of Dr. Aartsen on this finding.

Clathrofenella reticulata (A. ADAMS, 1860).

Fig. 5.


A New Record for the Mediterranean.

Material
Haifa Bay, 11.VII.1970, to depth of 40 m., muddy sand, one shell (NS 12809).

Distribution
Remark

This species is extremely variable. Even in a small sample from the Persian Gulf (Biggs, 1973: 359) there are many variations. Our identification of this species is based on the characteristic of the shell of this species given by T. Habe (1970: 39) and chiefly on the figure of Kuroda, Habe, Oyama, 1971, Plate 107, fig. 12, which resembles the shell found at Haifa Bay. The determination may however be considered as tentative.

Scaliola cf. elata (Semper) Issel, 1869.

Fig. 6.

A New Record for the Mediterranean.

Material

Bardawil Lagoon, 3.IX.1974, 1 m. deep, one shell.

Distribution


Remark

Mr. Mienis (in litt.) disputed the identification of the shell of Scaliola from Bardawil on the basis of the following facts:

a) All the species belonging to the genus Scaliola are cementing minute grains of sand to their shell much in the way as certain species of Xenophora do with stones, shells and corals. These grains of sand form an integral part of the shells. Even after heavy erosion still scars are visible where these grains were fixed to the shell. This is pertinently not the case in the figured shell, which does not show any trace of sand grains.

b) Recently I could study quite a number of Scaliola specimens from several parts of the Red Sea, among them Scaliola elata. All these specimens show a shell with a rather sharp top. In the figured shell of Bardawil this is not the case. Instead of that it has a rather blunt top.

From these differences between true Scaliola and the figured shell it is evident that the latter is not congeneric ».

Family Cerithiidae

* Diala semistriata (Philippi, 1849).

Fig. 7.

Syn: Rissoa semistriata (Philippi, 1849)
Alaba semistriata (Philippi)
Litiopa semistriata (Philippi)
Syrnola semistriata (Philippi)

Dautzenberg, 1929: 293 (499)


Material

Shells: Bardawil Lagoon - 1) on the beach, 2.II.1970, 84 shells, collected by D. Poper, Department of Zoology, Tel-Aviv University. 2) in shallow water, 9.1.1974, about 30 shells. 3) The sample studied by H.K. Mienis, Hebrew University, Jerusalem (See Mienis, 1976 b).
Remark

*Diala semistriata* is very variable, it contains different forms.

"Generally we may distinguish two different types among the Bardawil material:
a) a slender shell with straight sides and channelled sutures.
b) a relatively wider shell with slightly convex whorls and simple sutures.

Whether these forms belong to two ecological morphs of one species, to two different species or have to be considered as the exponents of sexual dimorphism, has to be shown by a study of the anatomy.

As already briefly indicated in an earlier paper (Mienis, 1976 b: 30) the name of this taxon is preoccupied by *Diala semistriata* (Deshayes, 1833), a fossil from the Eocene of France. (A further study of the literature confirmed this opinion).

A review of the recent *Diala* species of the Indo-Pacific has to show whether our specimens from the Red Sea and Bardawil are indeed identical with *D. varia* (A. Adams) as mentioned by Tryon (1887: 282) or with any other already described taxon ». (Mienis, by litt.).

Distribution

Suez Canal: Lake Timsah, Great Bitter Lake, Little Bitter Lake, Gulf of Suez (Moazzo, 1939: 184); Gulf of Aqaba (Lamy, 1938: 73); Red Sea, Aden (Tomlin, 1927: 297); Gulf of Oman, Bombay (Melvill and Standen, 1901: 370); Persian Gulf (Biggs, 1973: 360); Madagascar (Dautzenberg, 1929: 293 (499)); Mauritius, Japan, Hong Kong (Tryon, 1887: 282).

* Cerithium kochi *Philippi*, 1848.

**Fig. 8. (spawn)**

**Syn:** Vertagus kochi (Philippi) - (Jousseaume, 1930: 288).

**Ochetoclava kochi** (Philippi) - (Nordsieck, 1974: 58).

**Material**

Live: dredged - Haifa Bay: 15.IV.1974, 31 m., sand, 354 specimens (NS 12860); 41 m., sandy mud, 1 specimen (NS 12861); 14.V.1974, 25 m., sandy mud, 217 specimens (NS 12862); 46 m., sand, 13 specimens (NS 12863); 10.VII.1974, 31 m., sandy mud, 1307 specimens (NS 12864); 10 m., sand, 22 specimens (NS 12865); 11. VII.1974, 40 m., muddy sand, 18 specimens (NS 12866); 29.VII.1974, 31 m., sand, 115 specimens (NS 12868); 40 m., muddy sand, 72 specimens (NS 12869); 31.VIII. 1974, 51 m., mud, 1 specimen (NS 12878); 25.XII.1974, 13 m., 4 specimens (NS 12871); 24.XII.1974, 33 m., sandy mud, 70 specimens (NS 12872); 25.XII.1974, 44 m., sandy mud, 29 specimens (NS 12873); 25 m., sand, 18 specimens (NS 12874); 26. XII.1974, 84 m., sandy mud, 1 specimen (NS 12875); 13.I.1975, 31 m., sandy mud, 51 specimens (NS 12876); 48 m., sandy mud, 4 specimens (NS 12877); 16.I.1975, 69 m., mud, 1 specimen (NS 12878); 26 m., sand, 151 specimens (NS 12879); 28.IV.1975, 33 m., sandy mud, 1278 specimens (NS 12880); 48 m., muddy sand, 37 specimens (NS 12881); 73 m., mud, 1 specimen (NS 12882); 26 m., sand, 139 specimens (NS 12883); 11.VI.1975, 9 m., sand, 19 specimens (NS 12884); 32 m., sandy mud, 2218 specimens (NS 12885); 46 m., muddy sand, 17 specimens (NS 12886); 24 m., sand, 883 specimens (NS 12887); 17.IX.1975, 31 m., sand, 5723 specimens (NS 12888); 46 m., sandy mud, 311 specimens (NS 12890); 71 m., mud, 1 specimen (NS 12891); 25 m., sand, 581 specimens (NS 12892).

Off Bardawil, 31°15'N, 32°41'E, 31.X.1975, 16 m., stones, 1 specimen (NS 12889).
Shells: 1) on beaches - Netanya, 16.II.1975, 1 shell (NS 12936); Gaza, 24.II.1975, 1 shell (NS 12937).
   2) dredged - Haifa Bay, 14.V.1974, 26 m., sandy mud, 4 shells (NS 12955); 46 m., mud, 5 shells (NS 12956); 67 m., mud, 4 shells (NS 12957); 29.VIII.1974, 40 m., mud, 17 shells (NS 12958); 25.XI.1974, 44 m., sandy mud, 16 shells (NS 12959); 25.XII.1974, 75 m., mud, 3 shells (NS 12960); 13.I.1975, 48 m., sandy mud, 15 shells (NS 12961); 28.IV.1975, 48 m., mud, 11 shells (NS 12962); 17.IX.1975, 46 m., mud, 6 shells (NS 12963); 71 m., mud, 14 shells (NS 12964).

Spawn
Observed by M. Tom in the aquarium of Tel-Aviv University, 28.III.1975. On the sandy ground appeared long narrow, twisted strings (diameter 1.5 mm). The gelatinous cover of the strings looked yellowish due to the sand grains adhering to it.

Remark
This Indo-Pacific species (C. kochi) was found at first in 1963 in the Mediterranean waters of Israel. It is at present one of the most abundant species in the continental shelf there, dredged mostly from the depths of 20-40 m. The most suitable substrate is sand and the next best is sandy mud.

Noteworthy is the announcement on the appearance of Cerithium kochi in the waters of Cyprus (DEMETROPOULOS and HADJICHRISTOPHORU 1976).

* Cerithium scabridum PHILIPPI, 1849.

Material
   2) Bardawil Lagoon, 2.VI.1974, 13 specimens (BFS 253); 15.IX.1974, 20 specimens (BFS 303).
   2) Salty water pond - Dor; 15.X.1974, 28 shells (NS 12812); 26.XII.1975, 2 shells (NS 12814).
   3) Bardawil Lagoon: 11.VI.1974, 68 shells (BFS 239); 12.VI.1974, 24 shells (BFS 240); 2.VII.1974, 10 shells (BFS 249); 16.VII.1974, 64 shells (BFS 263); 10.VII.1974, 11 shells (BFS 275); 5.VIII.1974, 13 shells (BFS 272); 6.VIII.1974, 8 shells (BFS 271); 21.VIII.1974, 1 shell (BFS 291); 3.IX.1974, 14 shells (BFS 294); 5.IX.1974, 12 shells (BFS 304); 15.IX.1974, 2 shells (BFS 310).

More detailed information is expected from the research of Y. Eyal, Hebrew University, Jerusalem, who is engaged in the study of the ecology and biology of C. scabridum in the South Eastern Mediterranean - (Report at the meeting of the Israeli Zoological Society, 1976).

Remark
1) Cerithium scabridum is a very variable species. SMITH (1891: 417) has named the Aden form Cerithium yerburyi; BIGGS (1973: 361) has put C. yerburyi into the synonymy of C. scabridum, this in accordance with TOMLIN (1927: 295). MOAZZO (1939: 174) listed C. yerburyi SMITH as separate species, but remarked that it is in reality only a variation of scabridum.

2) Noticeable is the recent information about the presence of C. scabridum along the East Coast of Sicily (Communication by letter of Dr. A. Di NATALE, 10.XI.1976). This species was found till now in Israel, Lebanon-Syria, Egypt.
Order Neogastropoda

Family Muricidae

Rapana rapiformis (Born, 1778).

Fig. 9a, 9b.


A New Record for the Mediterranean.

Material

Off Bardawil, IV.1976, 18-27 m. by fisherman, one juvenile shell (coll. D. Peled).

Distribution

Gulf of Suez, Gulf of Aqaba (STURANY, 1903: 31); Red Sea - Dahlak Archip. (REHDER in litt.). Aden (SMITH, 1891: 408); Persian Gulf (MELVIL and STANDE, 1901: 399); Madagascar (DAUTZENBERG, 1929: 218); Philippines, Japan, New Caledonia (CERNOHORSKY, 1972: 125, Pl. 35, fig. 6).

Remark

1) The juvenile shell of Rapana rapiformis found off Bardawil (Mediterranean) looks completely fresh and the colors are vivid. The collector of the shell, Mr. Dov Peled, who kindly put it to our disposal for examination, could not ascertain whether he received the shell from the fisherman with the soft body or as dead shell.

2) The finding of Rapana rapiformis on April 1976 in the Mediterranean, is, in fact, not the first one. In the collection of the Sea Fisheries Research Station, Haifa, was found another shell of Rapana rapiformis, labelled « Turkey 1966 ». Being doubtful of the reliability of these data, the authors did not include this species in their first survey (1973).

3) Rapana rapiformis is the second species of the genus Rapana in the Mediterranean region. The first one Rapana venosa (VALENCIENNES, 1846) appeared in the Black Sea before 1947. Ever since it has spread throughout the whole Black Sea (MIENIS, 1976a: 41). Recently it has been reported from the Adriatic Sea (GHISOTTI, 1974: 13).

* Murex tribulus LINNAEUS, 1758.

Material


The specimens reported here were found near the entry to the Suez Canal, like those recorded in our first survey (1973) and not elsewhere further.

The prediction of PALLARY (1938: 27) in his publication on the marine mollusks of Syria « A priori il n'y a rien d'impossible à ce que cette espèce erythréenne se trouve sur les côtes de Syrie puisqu'en 1912, elle était déjà à Port Said », seems to be, after 39 years, still far from realization.
*Aspella anceps* (Lamarck, 1822).

This species was recorded formerly from Israel, Egypt, Libya (Barash and Danin, 1973). The last years, findings of this species were reported from other parts of the Levant: Turkey - Gulf of Antalya (Falchi, 1974: 89), Cyprus (Demetropoulos and Hadjichristophorou, 1976: 77).

*Thais carinifera* (Lamarck, 1822).

Material
2) Dredged - off Bardawil, II.1976, 18 m., deep, one shell (coll. D. Peled).

The reduction in findings of this species, which was formerly common on the rocky shores, is because of its extermination by anglers who used this mollusk as bait.

Family Columbellidae

*Anachis savignyi* (Moazz, 1939).

Material
Live: intertidal zone, Akko 24.VI.1976, one specimen on Laurencia.

Remark
- According to Mienis (1972: 18) and Barash and Danin (1973: 314), this species was collected for the first time in the Mediterranean on the beach of Bat Gallim (Haifa) in 1962. Recently indicated Mienis (1976d: 54) that Anachis savignyi was collected some years earlier. He found in the collection of the Hebrew University, Jerusalem, a specimen from Shavei-Ziyyon, which was collected in 1954 and J. Van Aartsen found this species in 1958 at Carmel Beach, Haifa.

Family Nassariidae

*Nassarius arcularius* (Linnaeus, 1758) *plicatus* (Roeding, 1798).

Fig. 10.

A new record for the Mediterranean.

Material
Shells: 1) On the beach of Bardawil, 1.IV.1974, 3 shells (NS 12805).
2) Dredged, Haifa Bay, 29.IV.1968, 18-24 m., one shell (NS 12806).

Distribution

Remark
- The nominate species *Nassarius arcularius arcularius* (Linnaeus, 1758) which ranges from the Pacific to about Indonesia and India, differs from the Indian Ocean (Western region) subspecies *plicatus* in the lack of the prominent spiral cords; the Pacific arcularius is always considerably smoother, usually lacking spiral cords on the body whorl altogether. (Communication by letter of Prof. W.O. Cernohorsky).
Family *Fasciolariidae*

*Fusinus marmoratus* (PHILIPPI, 1846).

**Material**

Shells: dredged - Akko-Nahariya, 14.VII.1969, 59 m. deep, 2 shells (NS 13023). Haifa Bay: 10.III.1951, depth unknown (HUJ); 24.I.1955, 37 m., 2 shells (SFRS 182); 30.XII.1955, 51 m., one shell (SFRS 336); 14.V.1974, 37 m., mud, one shell (NS 12938).

Off Bardawil, April 1976, 37 m., 4 shells (Coll. D. Peled).

**Remark**

The first finding of a worn shell of *F. marmoratus* between Akko and Haifa at a depth of 50 m., was recorded by GRUVEL and MoAZZO (1931: 441). After an interruption lasting several decades, the additional shells mentioned above were found and some of them in good condition. *Fusinus marmoratus* may be considered at present as rather rare or not uncommon in Israel.

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Subclass *OPISTHOBRANCHIA*

Order *ENTOMOTAENIATA*

Family *Pyramididae*

*Chrysallida maiae* (HORNUNG and MERMOD, 1924)

**Material**

Shells: 1) On the beach of Dor: 15.III.1968, 2 shells (NS 12807); 20.IV.1969, one shell (NS 12808).

2) Dredged - Haifa Bay, 13.III.1967, 26 m., 23 shells (SFRS 1373). Bat Yam: 26.X.1960, 38 m., sandy mud, 19 shells (SFRS 514); 46 m., sand, one shell (SFRS 515); 27.V.1961, 9 m., sandy mud, 11 shells (SFRS 582).

**Distribution**


**Remark**

Dr. J.J.Aartsen found *Chrysallida maiae* for the first time in 1958 on the Carmel Beach of Haifa (AARTSEN, 1963: 1116) and afterwards (1974: 233) he announced the finding of this species also in Iskanderun, Turkey. Additional information about the occurrence of *Ch. maiae* at the beach of Iskanderun was obtained from the late Dutch malacologist A.L. BRANDHORST (by letter dated 17.XI.1968). In the opinion of H.K. MIENIS (1976c: 53), *Chrysallida maiae* is probably permanently living in the Eastern Mediterranean.
Order  **ANASPIDEA**

Family  **Aplysiidae**

*Bursatella leachi* de BLAINVILLE, 1817, *s. sp. savigniana* AUDOUIN, 1826.

**Material**
1) Salty water pond, Dor, 25.IV.1975, 1 m. deep, 3 specimens (NS 12706).
2) Dredged - Haifa Bay, 17.IX.1975, 25 m., sand, one specimen juv (NS 12954).
   Off Bardawil: 28.VII.1975, 37 m., 7 specimens juv. (NS 12817); 31°35'N, 32°46'E.
   31.X.1975, 46 m., sandy mud, one specimen juv. (NS 12910).

**Order  **NOTASPIDEA**

Family  **Pleurobranchidae**

*Pleurobranchus forskali* RÜPPEL and LEUCKART, 1828.

Syn: *Oscanius forskali* (RÜPPEL and LEUCKART, 1828).

A New Record for the Mediterranean.

**Material**
Dredged - Haifa Bay, 14.II.1975, 48 m., sandy mud, 2 specimens (NS 12908).

**Distribution**
Gulf of Aqaba, Red Sea (ENGEL and EEKEN, 1962: 22), Gulf of Aden, East Africa
Zanzibar (THOMPSON, 1970: 184-186, fig. 6).

Berthellina citrina (RÜPPEL and LEUCKART, 1828).


**Material**
Live: Dor, intertidal zone, 6.VII.1956, one specimen (NS 993).

**Distribution**
Suez Canal: North of Lake Timsah, Great Bitter Lake (O'DONOUGUE, 1929: 788); Gulfs
of Suez and Aqaba (HAEFELFINGER, by litt.); Red Sea (ENGEL and EEKEN, 1962: 21);
Gulf of Aden, Mauritius, South Africa - False Bay, Ceylon, Indonesia, New Caledonia,

**Remark**
« This species is a rare visitor to our southern shores (British shores), although it is prevalent on the Atlantic and Mediterranean coasts of France. Under various names it has been reported from various exotic localities, even as far as Australia ». (THOMPSON and BROWN, 1976: 44).
Order Nudibranchia

Family Glossodorididae

Glossodoris runcinata (BERGH, 1877).
Syn: Chromodoris runcinata BERGH, 1877 - (O'DONOGHUE 1929: 811).
Doris infucata RUEPELL and LEUCKART, 1828 - (ISSEL, 1869: 156).
A New Record for the Mediterranean.

Material
Intertidal zone - Dor, 10.IX.1974, 1 specimen (NS 12914).
Caesarea, 4.IV.1965, one specimen (NS 981).

Distribution
Gulf of Suez - El Tur (ISSEL, 1869: 156); Gulf of Aqaba - Eilat (ENGEL and EEKEN, 1962: 24); Philippines, Tadjoura Bay (O'DONOGHUE, 1929: 823).

Family Discodorididae

Discodoris concinna (ALDER and HANCOCK, 1864).
A New Record for the Mediterranean.

Material
Haifa Bay, 29.VIII.1974. dredged at a depth of 40 m., muddy sand, one specimen (NS 12909).

Distribution

Subclass Pulmonata

Order Basommatophora

Family Siphonariidae

Siphonaria kurracheensis REEVE, 1856.

Material
Dor, intertidal zone, 14.VI.1974, one specimen (NS 12818).
Class BIVALVIA

Order FILIBRANCHIA

Family Arcidae

*Scapharca natalensis* (Krauss, 1848).

Material
Shells: Bardawil Lagoon: 11.IV.1974, 1 m., deep, one valve (BFS 242); 2.VII.1974, 2 valves (BFS 252); 3.IX.1974, 10 valves (BFS 293).

Family Glycymeridae

*Glycymeris* cf. arabica (H. Adams, 1870).

Fig. 12.

Syn: *Axinœa arabica* H. Adams

Pectunculus arabicus (H. Adams) \{ Lamy, 1911: 106

A New Record for the Mediterranean.

Material
Dor, 14.I.1966, 46 m., deep, one shell (SFRS 1199).

Distribution

Remark
The identification of the somewhat damaged shell of this species found in Israel, offered certain difficulties. Prof. Fischer-Piette (Museum d'Histoire Naturelle de Paris) gave his opinion: « chez Glycymeris arabicus (Adams) il-y-a une certaine analogie avec ce genre de sculpture mais comme votre échantillon est cassé dans la region postéro-ventrale, nous ne savons pas s'il presentait la sub-angulosité que possède arabicus dans cette region ». (Communication by letter).

Family Limopsidae

*Limopsis multistriata* (Forskal, 1775).

Fig. 13.


A New Record for the Mediterranean.

Material
Dor, 22.XII.1965, 48 m., deep, gravel bottom, one shell (SFRS 1187).

Distribution
Gulf of Suez, Red Sea, Aden (Sturany, 1899: 41); Madagascar (Dautzenberg, 1929: 376 (582)); India (MELVILL and STANDE, 1906: 799).
Family *Mytilidae*

*Modiolus glaberrimus* (Dunker, 1856).

Material

Shells: dredged - off Bardawil, 31°30’N, 32°58’E, 55 m., deep, 1.XI.1975, mud, 7 valves (NS 12942).

*Brachidontes variabilis* (Krauss, 1848).

Material

Live: 1) Intertidal zone - Rosh HaNiqra, 20.IX.1973, 2 specimens (NS 12825); Neve Yam, (South of Atlit), 3.XII.1975, 1 specimen (NS 12826), Tel Barukh, 26.I.1972, 3 specimens (NS 12824).

2) Bardawil Lagoon, 16.VII.1974, 5 specimens (BFS 263); 6.VIII.1974, 2 specimens (BFS 283); 21.VIII.1974, 10 specimens (BFS 291, 292); 3.IX.1974, 4 specimens (BFS 302); 15.IX.1974, 1 specimen (BFS 307).


2) Bardawil Lagoon, 11.VI.1974, 1 valve (BFS 243); 10.VII.1974, 1 valve (BFS 265); 16.VII.1974, 5 shells (BFS 267); 6.VIII.1974, 1 valve (BFS 279); 15.IX.1974, 32 valves (BFS 303-309).

Remark

One small live specimen of *Brachidontes variabilis* was collected by dredging in Cyprus, Cape Andreas, 22.V.1969, 65 fm (SFRS). This Indo-Pacific species was not recorded till now from this island. It is desirable to wait for other findings in order to assure the presence of *B. variabilis* in the waters of Cyprus.

Family *Maeidae*

*Malleus regula* (Forskal, 1775).

Material

Live: 1) Intertidal zone - Akko, 16.VI.1975, 1 m., deep, 1 specimen (NS 12820).

Live: 2) Dredged - Haifa Bay: 15.IV.1974, 31 m., deep, sand, 3 specimens (NS 12848); 16.II.1975, 69 m., mud, on a sponge, 1 specimen (NS 12849); 18 m., rocks, 3 specimens (NS 12850); 17.IX.1975, 25 m., sand, 1 specimen (NS 12851). Off Bardawil, 31.X.1975: 16 m., deep, rocks, stones, 1 specimen (NS 13021); 46 m., sandy mud, 1 specimen (NS 13022).

Shells: Dredged - off Bardawil, 31°15’N, 32°41’E, 31.X.1975, 16 m., stones, 3 valves (NS 12931).

Family *Pteriidae*

*Pinctada radiata* (Leach, 1814).

Material


Live: 2) Dredged - Haifa Bay: 15.IV.1974, 31 m., sand, 2 specimens (NS 12852); 16.II.1975, 69 m., mud, 1 specimen (NS 12853); 18.IX.1975, 10 m., sand, 1 specimen (NS 12854).

Shells: On the beach - Netanya, 5.VII.1974, 1 valve (NS 12821); 21.I.1975, 1 valve (NS 12822).
Order EULAMELLIBRANCHIA

Family Cardiidae

*Papyridea papyracea* (Gmelin, 1790).

Material
Live: Dredged - Haifa Bay: 29.IV.1975, 26 m., sand, 1 specimen (NS 12855); 17. IX.1975, 25 m., 1 specimen (NS 12856).
Shells: Dredged - Haifa Bay: 29.VIII.1974, 40 m., muddy sand, 1 valve (NS 12939); 31.VIII.1974, 51 m., mud, 1 valve (NS 12940).

Family Veneridae

*Paphia textile* (Gmelin, 1791).

Material
Live: Dredged - Haifa Bay: 15.IV.1974, 32 m., muddy sand, 1 specimen (NS 14018); 10.VII.1974, 31 m., muddy sand, 3 specimens (NS 14209). Off Bardawil, 31°23'N, 33°22'E, 2.XI.1975, 27 m., mud, 2 specimens (NS 12858).
Shells: Dredged - off Bardawil, 31°35'N, 32°46'E, 31.X.1975, 46 m., sandy mud, 1 shell (NS 12943).

Family Tellinidae

*Angulus valtonis* (Hanley, 1844).

Fig. 14.

A New Record for the Mediterranean.

Material
Bardawil Lagoon, 2.II.1970, 0.5-1 m., deep, 6 valves (BFS).

Distribution
Suez Canal: Timsah Lake, Great Bitter Lake (Moazzo, 1939: 121).
Gulf of Suez, Red Sea - Djibouti, Aden (Lamy, 1918: 129).

Family Mactridae

*Mactra olorina* Philippi, 1846.

Material
Bardawil Lagoon - shallow water, ca. 1 m., deep.
Live: 9.III.1974, 1 specimen (BFS 294); 15.IX.1974, 3 specimens (BFS 300).
Shells: 2.VI.1974, 23 shells and 114 valves (BFS 235); 6.VIII.1974, 6 shells and 17 valves (BFS 279); 3.IX.1974, 9 shells and 53 valves (BFS 294); 15.IX.1974, 30 shells and 41 valves (BFS 300, 307, 310).
Family **Mesodesmatidae**

*Atactodea striata* (GMELIN, 1790).

**Fig. 15.**

*Syn:* *Mesodesma striatum* (GMELIN) - (DAUTZENBERG, 1929: 407)

? *Mesodesma glabrata* (GMELIN, 1790) - (LAMY, 1914: 41)

A New Record for the Mediterranean.

**Material**


**Distribution**

Suez Canal (Timsah Lake, Great and Little Bitter Lakes), Gulf of Suez (MOAZZO, 1939: 102); Gulf of Aqaba (LAMY, 1938: 37); Red Sea, Moluccas Is., Philippines, New Guinea, New Caledonia, Fiji Is., Central Pacific Is. (LAMY, 1914: 47-48); Madagascar (DAUTZENBERG, 1929: 408); Japan (KIRA, 1968: 166, Pl. 58, fig. 33); Indonesia (W. ADAM and E. LELOUP, 1939: 88).

**Remark**

*Atactodea striata* has often been confused with *A. glabrata*. The main difference between them is in the outline of the shell. *A. striata* is almost equilateral and ovate, *A. glabrata* slightly inequilateral and triangular. But such a difference is only in extreme cases. There are numerous intermediate transitional specimens, ranging from a high triangle to an oblong ovate form. Consequently, *A. striata* and *A. glabrata* may be considered as two variations of the same species (after LAMY, 1914: 47; SATYAMURTI, 1956: 137). It is noteworthy that the geographical distribution of these two species is very similar and almost overlapping.

Family **Gastrochaenidae**

*Gastrochaena cymbium* SPENGLER, 1783.

**Material**

Live: Dredged - Haifa Bay, 11.VII.1974, 77 m., mud, 1 specimen (NS 12859) attached to the shell of a living *Cardita aculeata*.

Shells dredged - Haifa Bay, 31.VIII.1974, 51 m., mud, 4 capsules (NS 12941) attached to valves of *Glycymeris*.
GeneraI Remarks

13 Indo-Pacific species new to the Mediterranean were recorded in this paper and for 2 species data were given for the first time: *Chiton platei* and *Berthellina citrina*.

These 15 species represent 3 classes of Mollusca: Polyplacophora, 1 species - Gastropoda, 10 (9 new species) - Bivalvia, 4. No Indo-Pacific species of Scaphopoda and Cephalopoda have been encountered hitherto in the Mediterranean.

The only representative of Polyplacophora - *Chiton platei* - is a particular record of Indo-Pacific chitonids in the Mediterranean.

Of the 9 new species of Indo-Pacific Gastropoda, 6 belong to Prosobranchia and 3 to Opistobranchia. The Prosobranchia are: *Dahlakia cf. leilae*, *Eufenella pupoides*, *Clathrofenella reticulata*, *Scaliola cf. elata*, *Rapana rapiformis* and *Nassarius arcularius*. The last two species belong to Neogastropoda; the rest to Mesogastropoda.

The Opistobranchia are as follows: *Pleurobranchus forskali* (Notaspidea), *Glossodoris runcinata* and *Discodoris concinna* (Nudibranchia).

The new Indo-Pacific species of Bivalvia are: *Glycymeris cf. arabica*, *Limopsis multistriata*, *Angulus valtonis* and *Atactodea striata*.

Of the 13 new immigrants four species were found alive: *Pleurobranchus forskali*, *Glossodoris runcinata*, *Discodoris concinna*, *Atactodea striata*. They may be regarded as potentially resident in the Mediterranean.

Nine species were collected only as shells, mostly worn, singly or in small numbers. These are: *Dahlakia cf. leilae*, *Eufenella pupoides*, *Clathrofenella reticulata*, *Scaliola cf. elata*, *Rapana rapiformis*, *Nassarius arcularius*, *Glycymeris cf. arabica*, *Limopsis multistriata*, *Angulus valtonis*. It is not unlikely that the shells of these species were occasionally brought to the sites in which they were found.

The new immigrants enumerated in this paper are mostly from the Gulfs of Suez and Aqaba (Eilat); three species *Eufenella pupoides*, *Angulus valtonis*, *Atactodea striata* are known also to occur in the Suez Canal.

Data on the distribution in the Mediterranean of the New Indo-Pacific species, recorded at first in this paper, are presented in Table I. In this table are also included *Chiton platei*, *Berthellina citrina*, for which data were noted at first here, and also the four Indo-Pacific species first recorded by J.J. van AARTSEN and H.K. MIENIS: *Chrysalildia maiae*, *Diala semistriata*, *Cerithium nesioticum* and *Ventomnestia girardi*. These species were not listed in the publications of BARASH and DANIN (1973) and GHISSOTTI (1974).
As mentioned already, supplementary data has been given for 24 Indo-Pacific species recorded previously for the Mediterranean. These are as follows.

**Gastropoda**

*Diodora rueppelli*
*Isanda cf. holdsworthiana*
*Alvania orbignyi*
*Pirenella cailliaudi*
*Diala semistriata*
*Cerithium kochi*
*Cerithium scabridum*
*Murex tribulus*
*Aspella anceps*
*Thais carinifera*
*Anachis savignyi*
*Fusinus marmoratus*
*Chrysallida maiae*
*Bursatella leachi savigniana*
*Siphonaria kurracheensis*

**Bivalvia**

*Scapharca natalensis*
*Modiolus glaberrimus*
*Brachidontes variabilis*
*Malleus regula*
*Pinctada radiata*
*Papyridea papyracea*
*Paphia textile*
*Mactra olorina*
*Gastrochaena cymbium*

All the species mentioned above are among those regarded in the former survey of BARASH and DANIN (1973) as residents in the Mediterranean Sea. Of the species considered to be occasional no new specimens were collected except Alvania orbignyi and Fusinus marmoratus. Alvania orbignyi is now represented by 73 shells collected at different localities along the Israeli Mediterranean coast and is obviously a resident there. Fusinus marmoratus though scarce in this area it is not uncommon.

Altogether 68 Indo Pacific species, which invaded the Mediterranean, are known today. The great part of these immigrants are Gastropoda - 42 species. The Bivalvia are represented by 25 species and the Polyplacophora only by one. All the species are benthos dwellers.
The overwhelming majority of the Indo Pacific species in the Mediterranean are concentrated to the north and east of the Suez Canal - on the Levant coast, in particular at Israel and the Sinai Peninsula. To date only 9 of the 68 species are not represented in this part of the South Eastern Mediterranean, or not with certainty.

It is worthwhile to note the appearance of the Indo Pacific species on the islands from which they were not recorded in the previous publications: at Cyprus - Cerithium kochi, Aspella aniceps and probably Brachidontes variabilis; at Sicily - Cerithium scabridum. It seems that the spreading of the new Indo Pacific immigrants in other parts of the Mediterranean removed from the Suez Canal is actually advancing, but at a very slow rate.

The intensive expansion of Brachidontes variabilis in Sicily is rather remarkable. Di Geromino (1971) discovered the first specimens in 1969 South of Syracuse. At present this species is commonly distributed along the Eastern and Tyrrenhian coasts of Sicily (Arcidiacono and Di Geromino, 1976). Recently living specimens of this mytilid were found on the Ionian Coast of Calabria (Zanca, 1976).

According to our knowledge at present, the most successful immigrants, in terms of adaptation to the new area are Diodora rueppelli, Isanda cf. holdsworthiana, Pirenella cailliaudi, Cerithium scabridum, Cerithium kochi, Thais carinifera, Bursatella leachi savigniana, Brachidontes variabilis, Malleus regula, Pinctada radiata, Paphia textile, Mactra olorina, Gastrochaena cymbium.

The evidence for successful settlement was given for Cerithium scabridum, Thais carinifera and Bursatella leachi savigniana (Barash and Danin, 1973); the finding of their eggs served as proof of their capacity of reproduction under the changed environmental conditions. The same evidence has now been shown for Cerithium kochi, as the spawning of this species was observed (Fig. 8).

The extreme heterogeneity of the 68 immigrating species from a systematic point of view is noteworthy (Table II). They are divided among 59 genera and 43 families. Only 6 genera are represented by more than one species, namely: Cerithium - 4 species, Rapana - 2, Scapharca - 2, Modiolus - 3, Chama - 2, Papyridea - 2 species.

The ability of the Indo Pacific Molluscan newcomers to adapt themselves to living in new habitats in the Mediterranean seems to be a phenomenon on the species level and may not be attributed to higher taxa.
Table I

Distribution of Indo-Pacific Species of Mollusca in the Mediterranean (*)

<table>
<thead>
<tr>
<th>Species</th>
<th>First record</th>
<th>Distrib. in the Mediterran.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>POLYPLACOPHORA</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chiton platei</td>
<td>1974 (AL. BAR.)</td>
<td>Israel: Akko, Caesarea</td>
</tr>
<tr>
<td><strong>GASTROPODA</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>PROSOBRANCHIA</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dahlakia cf. leilae</td>
<td>present paper</td>
<td>Sinai Peninsula: Bardawil</td>
</tr>
<tr>
<td>Eufenella pupoides</td>
<td>present paper</td>
<td>Israel: Akko, Atlit</td>
</tr>
<tr>
<td>Clathrofenella reticulata</td>
<td>present paper</td>
<td>Israel: Haifa Bay</td>
</tr>
<tr>
<td>Scaliola cf. elata</td>
<td>1976 (H.K. MIENIS)</td>
<td>Sinai Peninsula: Bardawil</td>
</tr>
<tr>
<td>Diala semistriata</td>
<td>present paper</td>
<td>Sinai Peninsula: Bardawil</td>
</tr>
<tr>
<td>Cerithium nesioticum</td>
<td>1977 (H.K. MIENIS)</td>
<td>Israel: Shiqmona (South Haifa)</td>
</tr>
<tr>
<td>Rapana rapiformis</td>
<td>present paper</td>
<td>Sinai Peninsula: Bardawil</td>
</tr>
<tr>
<td>Nassarius arcularius</td>
<td>present paper</td>
<td>Israel: Haifa Bay, Sinai Peninsula: Bardawil</td>
</tr>
<tr>
<td><strong>OPISTHOBRANCHIA</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chrysallida maiae</td>
<td>1963 (J.J. AARTSEN)</td>
<td>Isr: Haifa Bay, Carm. Beach Dor, Bat-Yam. Turkey: Isk.</td>
</tr>
<tr>
<td>Ventomnestia girardi = Cylichnina girardi</td>
<td>1976 (H.K. MIENIS)</td>
<td>Sinai Peninsula: Bardawil</td>
</tr>
<tr>
<td>Pleurobranchus forskali</td>
<td>present paper</td>
<td>Israel: Haifa Bay</td>
</tr>
<tr>
<td>Berthellina citrina</td>
<td>1970 (N.B. EALES)</td>
<td>Israel: Dor</td>
</tr>
<tr>
<td><strong>BIVALVIA</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Glycymeris cf. arabica</td>
<td>present paper</td>
<td>Israel: Dor</td>
</tr>
<tr>
<td>Limopsis multistriata</td>
<td>present paper</td>
<td>Israel: Dor</td>
</tr>
<tr>
<td>Angulus valtonis</td>
<td>present paper</td>
<td>Sinai Peninsula: Bardawil</td>
</tr>
<tr>
<td>Atactodea striata</td>
<td>present paper</td>
<td>Israel: Netanya</td>
</tr>
</tbody>
</table>

(*) Not reported in the publications of Barash and Danin (1973) and Ghisotti (1974).
Table II

Composition of the Indo-Pacific Species in the Mediterranean

<table>
<thead>
<tr>
<th>Class, Subclass</th>
<th>Order</th>
<th>Famil.</th>
<th>Gen.</th>
<th>Species</th>
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</thead>
<tbody>
<tr>
<td>Class POLYPLACOPHORA</td>
<td>Chitonida</td>
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<td>1</td>
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<tr>
<td>Class GASTROPODA</td>
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<td>Subclass Prosobranchia</td>
<td>Archaeogastropoda</td>
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<tr>
<td>Subclass Prosobranchia</td>
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<td>Subclass Prosobranchia</td>
<td>Neogastropoda</td>
<td>8</td>
<td>11</td>
<td>12</td>
</tr>
<tr>
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<td>Entomotaeniata (Pyramidellidae)</td>
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</tr>
<tr>
<td>Subclass Opisthobranchia</td>
<td>Cephalaspidea</td>
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<td></td>
</tr>
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<td>Anaspidea</td>
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<td>Subclass Opisthobranchia</td>
<td>Notaspidea</td>
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<td>2</td>
<td>2</td>
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<tr>
<td>Subclass Opisthobranchia</td>
<td>Nudibranchia</td>
<td>2</td>
<td>2</td>
<td>2</td>
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<tr>
<td>Subclass Pulmonata</td>
<td>Basommatophora</td>
<td>1</td>
<td>1</td>
<td>1</td>
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<tr>
<td>Class BIVALVIA</td>
<td>Filibranchia</td>
<td>8</td>
<td>9</td>
<td>12</td>
</tr>
<tr>
<td>Class BIVALVIA</td>
<td>Eulamellibranchia</td>
<td>9</td>
<td>11</td>
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<tr>
<td><strong>TOTAL:</strong></td>
<td></td>
<td>43</td>
<td>59</td>
<td>68</td>
</tr>
</tbody>
</table>
Variations of *Pirenella cailliaudi* (Pot. & Mich., 1838)
Height 12.5 mm (average)

*Chiton platei* Thiele, 1910
Length 16 mm, width 10 mm

*Dahlakia cf. leilae*
Biggs, 1971 - Height 10 mm

*Clathrofenella reticulata* (A. Adams, 1860)
Height 3.5 mm

*Eufenella pupoides*
(A. Adams, 1860)
Height 3.5 mm
Scaliola cf. elata Issel, 1869
Height 4 mm

Diala semistriata (Phil., 1849)
Height 3 mm

Cerithium kochi Philippi, 1848 - Egg mass (magnified)
**Rapana rapiformis** (BORN, 1778) _juv._
Height 24 mm, width 17.8 mm
width with spines 18.9 mm

**Rapana rapiformis** (BORN, 1778)
View from above (magnified)

**Nassarius arcularius** (L., 1758)
Height 15 mm

**Chrysallida maiae** (HORN. & MERMOD, 19...)
Height 4 mm
Glycymeris cf. arabica (H. Adams, 1870) - Length 5 mm, juv.

Limopsis multistriata (Forskal, 1775) - Length 16 mm
Angulus valtonis (Hanley, 1844) - Length 16 mm, height 9 mm

Actodea striata (Gmelin, 1790) - Length 17 mm, height 11 mm
Acknowledgements

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(*) Dated 1972 on the cover, but produced July 1973


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