

Material of this species was examined from the following localities: Haifa Bay (samples 98, 245), Atlit, Tantura, Caesarea (rock pools, VI.1946) and Bat Yam. The Haifa specimens were collected at depths of 22 and 29 m, respectively. The carapace lengths of the specimens varied between 4.5 and 23 mm; in two ovigerous females it was 11 and 11.5 mm, respectively.

Xantho poressa is also known under the names *Xantho hydrophilus* (Herbst 1790) and *Xantho rivulosus* (Risso 1816), both of which are incorrect (see Holthuis 1954). The systematics of this and related species of the genus have been dealt with extensively by Drach and Forest (1953).

The species inhabits the entire Mediterranean, the Black Sea and the Canary Islands. The records from the E Mediterranean are: Navarino Bay, Methone (=Modon) and Sapienza, S Greece (Guérin 1832, as *Cancer cinereus*), Phaleron Bay near Athens (Athanasopoulos 1917), Bosphorus (Heller 1863), Istanbul fishmarket (Ninni 1923), near Gallipoli, Sea of Marmara (Ostroumoff 1896), near Khaniá, NW Crete (Lucas 1853, Raulin 1870), Rhodes (Santucci 1928, Tortonese 1947), Cyprus (Heller 1863), Lebanon (Drach and Forest 1953), Sidon (=Saida), Lebanon (Monod 1931), Israel (Bodenheimer 1935, 1937), Haifa (Steinitz 1933), Caesarea, Israel (Gottlieb 1953), Egypt (Audouin 1826), Port Said (Calman 1927), near Alexandria, Egypt (Bals 1936). In the U.S. National Museum, Washington, D.C., two specimens of this species from Istanbul (IX., X. 1923, H. C. Kellers) were examined.

Xantho granulicarpus Forest, 1953

Xantho? floridus Gottlieb, 1953, p. 440.

Material from the following localities has been examined: Haifa Bay (samples 98, 121, 138, 195, 385), Tantura (7.VII.1952 and 5.VII.1955, coll. Tel Aviv Institute of Natural Science), Caesarea (rock pools, 16.VII. and 23.X.1952). The Haifa specimens were collected at depths between 18 and 46 m. The carapace lengths of the twelve specimens examined vary between 5 and 14 mm. Ovigerous females (cl. 9 and 10 mm) were collected in the months of April and June (samples 98, 195).

Xantho granulicarpus has for a long time been confused with *Xantho incisus* Leach (=X. *floridus* auct., non *Cancer floridus* L.). Drach and Forest (1953) in their revision of the European *Xantho* species showed it to be a distinct form.

Xantho granulicarpus is known from the entire Mediterranean, but far as known to us it has not been encountered elsewhere. The records from the E Mediterranean are: Istanbul fishmarket (Ninni 1923), Páros, Cyclades (Drach and Forest 1953), Israel (Gottlieb 1953), Alexandria, Egypt (Bals 1936), Benghazi, Cyrenaica (Colosi 1923). The Rijksmuseum van Natuurlijke Historie possesses material of this species from Benghazi, Cyrenaica (rocky and sandy shore, XI.1951, C. Beets).

***Micropanope rufopunctata* (A. Milne Edwards, 1869) (Figure 15)**

A male (cl. 3.5mm) was collected in Haifa Bay (sample 390, depth 18 m). It shows some minor differences from the description and figures given by A. Milne Edwards and Bouvier (1900, p. 87, plate 16 figures 6—13) of *Xanthodes granosus*. The two inner lobes of the front have the anterior margin less distinctly convex than in the figure of the type, and the median incision of the front is deeper. The

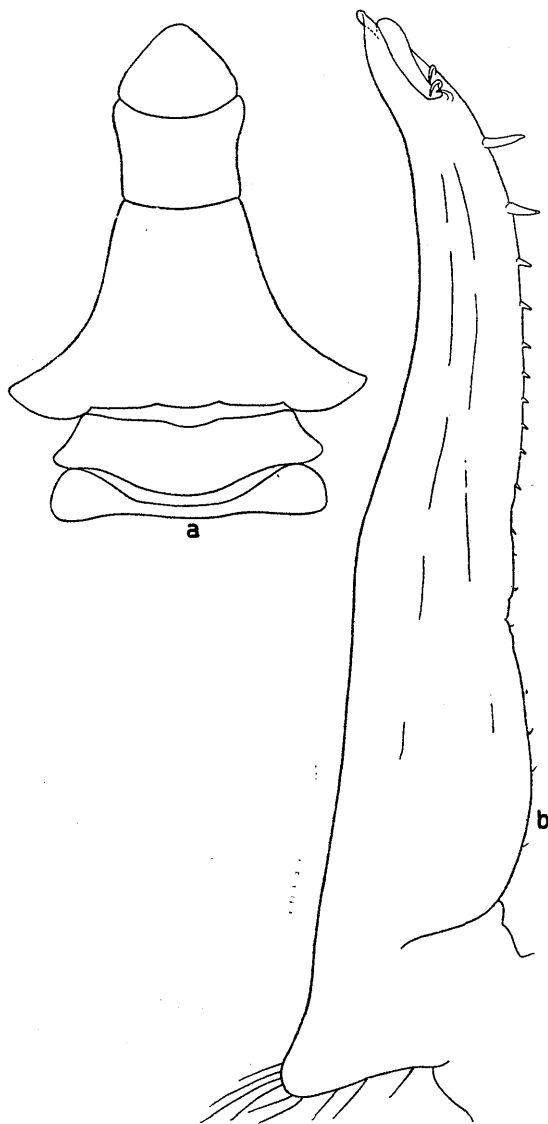


FIGURE 15.

Micropanope rufopunctata (A. Milne Edwards). a, abdomen of male; b, right first pleopod, posterior view. a, $\times 28$; b, $\times 50$.

external lobes of the front, which are at the same time the inner orbital angles, are sharply set off from the median lobes and distinctly placed more backwards. The four antero-lateral teeth, are more distinctly pointed than in the figure cited above. The granule pattern on the carapace is well shown by A. Milne Edwards and Bouvier. The larger chela of the male has the entire outer surface of the palm tuberculated; this tuberculation extends up to the base of the fixed finger. The inner surface is smooth or only slightly tuberculate, except for the upper portion where distinct tubercles may be seen. The dark colour of the fingers does not extend on the palm; the finger tips are slightly paler than the rest. The upper anterior margin of the carpus is crenulated or serrated, the inner of these crenulations or serrations being larger than the rest; the upper inner margin shows a distinct spine-like tooth. The smaller first leg and the walking legs (only one of the latter is present in our material) strongly resemble A. Milne Edwards and Bouvier's figures. The merus of the walking leg of our specimen has small tubercles on the lower margin. The first pleopod of our male is curved slightly outwards; the inner margin bears some spinules which increase in size distally; three strongly curved sharply pointed spines are placed near the lower part of the distal opening; the tip of the pleopod ends in some lobes. It agrees quite well with Monod's (1956) figure 392. The second segment of the male abdomen is angularly produced in the proximal half of its lateral margin as described by A. Milne Edwards and Bouvier. The sixth segment slightly broadens anteriorly, while the last segment is triangular with broadly rounded angles.

It is possible that the present specimen is not yet fully grown. A. Milne Edwards and Bouvier report on a male with cl. 7 mm, but have also small males (cl. 3 mm) in their collection; in these smaller specimens the front is straighter than in the large ones, which agrees very well with the observation made on the Israel male. Balss (1936) mentioned specimens of this species with cl. up to 12 mm; an ovigerous female in his material had a carapace length of 5.3 mm.

The species was originally placed in the genus *Xanthodes* Dana, while Balss (1936) used the generic name *Xanthias* Rathbun for it. However, the facts that the first legs are strongly unequal, that the median frontal lobes are sharply separated from the inner orbital angles and that the frontal lobes are not convex, show that the species cannot be maintained in the genus *Xanthias* as restricted by Odhner (1925, p. 84). Monod (1933, p. 65) referred *Xanthodes granosus* A. Milne Edwards and Bouvier doubtfully to the genus *Micropanope* Stimpson 1871. In a recent publication the same author (Monod 1956, p. 313) confirmed his opinion of 1933 and at the same time showed that the name *Xanthodes rufopunctatus* A. Milne Edwards, 1869, is synonymous with *Xanthodes granosus* A. Milne Edwards and Bouvier, 1898, so that the correct name of the species becomes *Micropanope rufopunctata* (A. Milne Edwards 1869). A comparison of our material with specimens of *Micropanope* does not leave any doubt that Monod is correct

and it is even doubtful whether the species is distinct from *Micropanope granulimanus* (Stimpson 1871), a species known at present from the Bahamas, Cuba and Curacao. Our material is too small, however, to permit a decision in this question to be made.

Micropanope rufopunctata is known from W Africa (Azores, Canary and Cape Verde Islands, Gold Coast) and from the E Mediterranean. In 1936 it was reported from Alexandria, Egypt by Bals (1936, pp. 38-39), who dealt with rather extensive material from a depth of 4 to 18 m.

***Pilumnopeus vauquelini* (Audouin, 1826)**

Pilumnopeus vauquelini Holthuis, 1956, p. 320.

Five specimens, two females (cl. 6 and 7 mm, the latter ovigerous) and three males (cl. 6.5 to 8 mm), were taken in Haifa harbour (7.VI. 1951, 6.VII.1952 and 1. XII.1954). The ovigerous female was collected in December. The specimens agree very well with the published descriptions of the species. The pleopod of the male checks perfectly with Stephensen's (1945, figure 35) figure of that organ of specimens from the Persian Gulf.

Pilumnopeus vauquelini inhabits the Red Sea and the Persian Gulf and has migrated through the Suez Canal to the E Mediterranean. It is probably the first crab ever to be recorded from the Suez Canal, since Keller's (1883) "kleine Krabbe" was identified by Krukenberg (1888) with the present species. Further records of the species from the Suez Canal are by Krukenberg (1888), Calman (1927), Fox (1927), Monod (1937, 1938) and Holthuis (1956). The records from the E Mediterranean are: Port Said (Calman 1927, Fox 1927), near Alexandria (Bals 1936). The species was reported from Israel by Holthuis (1956).

***Pilumnus hirtellus* (Linnaeus, 1758)**

Pilumnus hirtellus Gottlieb 1953, p. 440.

A juvenile female (cl. 4 mm) which evidently belongs to the typical *Pilumnus hirtellus* (L.) was collected in a rock pool near Caesarea (date unknown). The specimen has the frontal margin without spines. The teeth of the lower orbital border are small and of about equal size. There are five antero-lateral teeth (the orbital tooth included), the second of which is quite small. The palm of the larger cheliped has the outer surface smooth and naked for the larger part, the smooth area extending also over the upper half of the palm. The carpi of the walking legs do not show antero-dorsal spines. The carapace, especially in its posterior part, is far less hairy than in *Pilumnus spinifer* H. Milne Edwards.

Pilumnus hirtellus is known from the entire Mediterranean, the Black Sea and from the E Atlantic between the North Sea and the Cape Verde Islands. It has been recorded from the following E Mediterranean localities: near Istanbul, near

San Stefano, near Aphisia Island, and near Gallipoli, Sea of Marmara (Ostroumoff 1896), Crete (Lucas 1853, Raulin 1870), Sporades, 37° 37'N 26° 58'E (Adensamer 1898), Rhodes (Santucci 1928), Bay of Alexandretta (=Iskenderon), Turkey (Monod 1931), Caesarea, Israel (Gottlieb 1953), near Alexandria, Egypt (Balss 1936). Since the systematics of the E Atlantic representatives of the genus *Pilumnus* are rather confused, it is not certain that the just cited records indeed pertain to the typical *Pilumnus birtellus*.

***Pilumnus spinifer* H. Milne Edwards, 1834**

The species was collected in the following Israel localities : off Nahariya (samples 506, 1001), Haifa Bay (samples 98, 149, 169, 180, 226, 241, 245, 257, 258, 291, 316, 318, 346, 348, 398), off Natanya (trawl, 11.XII.1946), off Nabi Rubin (sample 832). The material was obtained at depths between 18 and 59 m; it consists of twenty-one specimens (cl. 4 to 15 mm), one of which is ovigerous (cl. 9 mm). The ovigerous female was collected in February (sample 348).

These specimens have the margin of the front with a deep median incision which at each side bears a strong acute tooth, externally of which some smaller teeth are placed; these are followed by a concave and unarmed part of the margin, while the antero-lateral angle of the margin ends in a spine. In smaller specimens the frontal teeth are generally less distinct than in the adults, but in some of the latter they seem to be worn down. The upper orbital border shows two fissures but no teeth. On the lower border of the orbit there are several rather widely and irregularly spaced teeth of various size, some of which are very strong. There are generally five antero-lateral teeth (the orbital tooth included), though the second may be very small and inconspicuous (like in the specimens of samples 241 and 506); in one specimen (sample 241) also the fifth antero-lateral tooth is conspicuously smaller than the fourth and the third. The carpus of the chelipeds bears numerous strong spines. The palm of the larger cheliped has the lower part of the outer surface smooth and naked, while hairs and spines are visible in the upper part. The smaller chela has the outer surface of the palm covered with tubercles all over. The carpus of the ambulatory legs bears a very strong distal spine on the upper margin (in the specimen of sample 348, these spines are very indistinct in the second legs). The carapace bears long and short stiff hairs and in addition to these some tufts of plumose hairs which give the animal a somewhat shaggy appearance.

Pilumnus spinifer H. Milne Edwards probably is a good species, specifically different from *Pilumnus birtellus* (L.). The problem whether or not *Cancer villosissimus* Rafinesque, 1814, and *Pilumnus villosus* Risso 1827, are distinct or identical with *Pilumnus spinifer*, requires investigation.

The present form has been reported from the entire Mediterranean, the Black Sea, the Portuguese coast, the Azores, and Mauritania. The previous records of this

species from the E Mediterranean are : Crete (Lucas 1853, Raulin, 1870). In the collection of the Sea Fisheries Research Station, Haifa, a male (cl. 17 mm) of this species from Mersin Bay, Turkey, is present.

***Eriphia verrucosa* (Forskål, 1775) (Plate III, figure 13)**

Eriphia spinifrons Steinitz, 1933, p. 152; Bodenheimer, 1937, p. 281; Gottlieb, 1953, p. 440; Carmin, 1955, p. 2.

Twenty-four specimens (cl. 3 to 60 mm) were examined from : Haifa Bay (a detached chela in sample 169, dredge, depth 31 m, 30.XI.1954; near the mouth of Kishon river, 4.VIII.1955), Caesarea (in rock pools, 3.IV.1951, 12 and 19.VI. and 16.VII.1952, and VI.1954), Tel Aviv (8.VI.1929, 3.I.1930, 31.XII.1931, 2.VIII.1935, 25.VI.1939, leg J. Carmin), Bat Yam (19.VI.1929, leg. J. Carmin; 1.XI.1945, coll. Institute of Natural Sciences, Oranim), Mediterranean coast of Israel (leg. J. Carmin). An ovigerous female was collected in April. This species is very common in the littoral area of the Israel coast, from where it was reported for the first time by Steinitz (1933), who dealt with material from Haifa. Gottlieb's (1953) material was collected in Caesarea rock pools, while Carmin's (1955) record is based on the above mentioned specimens of the Carmin collection.

Forskål's (1775, p. 93) description of his *Cancer verrucosus* runs as follows : "*Cancer verrucosus*; brachyurus; thorace laevi, utrinque 6-dentato; fronte multi-dentata; manibus verrucosis, apice nigris. Descr. Os latum. Chela dextra glabra & saepe major. Manuum apices nigri. Carpi quoque verrucosi. In reliquis pedibus carina femorum superior & tibiae ac tali pilis hispidi. Ad Thoracis latera utrinque 6. dentes validi post oculos. Inter oculos antice dentes minores plurimi, serie varia." Though this description, which is based on specimens from Constantinople (= Istanbul), is rather short, it does not leave the least doubt as to the identity of *Cancer verrucosus* Forskål, 1775, with *Cancer spinifrons* Herbst, 1785. The former name is the older of the two and has to be used for the present species, which usually is indicated with the incorrect name *Eriphia spinifrons*.

Eriphia verrucosa inhabits the entire Mediterranean and is furthermore known from the Black Sea and the E Atlantic between the S coast of Brittany, France, in the north and the Azores and Mauritania in the south. The records from the E Mediterranean are : Navarino Bay, Methone (= Modon), and Sapienza, S Greece (Guérin 1832), Istanbul (Forskål 1775, Ninni 1923), Sea of Marmara (Pesta 1918), Khania, NW Crete (Lucas 1853, Raulin 1870), Rhodes (Parisi 1913, Colosi 1923, Tortonese 1947), Israel (Bodenheimer 1937, Carmin 1955), Haifa (Steinitz 1933), Caesarea (Gottlieb 1935), Egypt (Audouin 1826), near Alexandria, Egypt (Balss 1936), Derna, Tolmeta, and Benghazi, Cyrenaica (Colosi 1923). Monod (1937, 1938) reported the species from the Suez Canal. The Rijksmuseum van Natuurlijke Historie possesses material of this species from Benghazi, Cyrenaica (rocky and sandy beach, XI.1951, C. Beets). Seventeen specimens of this

species (one of which infested with a Rhizocephalan) from Istanbul (XI., X.1923, H. C. Kellers) were examined in the U.S. National Museum, Washington, D. C.

Family GONEPLACIDAE

Goneplax rhomboides (Linnaeus, 1758)

Goneplax angulata Gottlieb, 1953, p. 440.

Material has been examined from: Haifa Bay (samples 163, 254, 265, 268, 286, 334), off Caesarea (trawl, depth 219m, 17.V.1953), off Natanya (samples 703, 1008), off Herzliya (samples 568, 569a), off Tel Aviv (sample 622), off Ashkelon (sample 580). The material was obtained from depths between 42 and 219 m; it consists of fourteen specimens which have carapace lengths ranging from 4 to 15 mm; no ovigerous females are present. The two specimens from off Natanya are both parasitized by Sacculinid Rhizocephala; the specimen of sample 703 has two, the other one parasite under the abdomen.

The name *Cancer rhomboides* Linnaeus, 1758, is older than *Cancer angulatus* Pennant, 1777, and therefore the former specific name must be used for the species by those authors who synonymize the two. Some specialists consider the two forms as distinct species or subspecies, *C. angulata* differing from *C. rhomboides* by possessing an additional tooth behind the antero-lateral tooth of the carapace. Other carcinologists (as Bouvier, 1940) report numerous transitions between the two forms which they therefore consider as a single species. Regardless of the actual taxonomic status of the two forms, the specific name *rhomboides* has to be used for the present Israel specimens, since all of them show only one antero-lateral tooth.

Goneplax rhomboides is known from the entire Mediterranean, from the Canary Islands and from Mauritania. If *Cancer angulata* is a synonym, the range of the species extends in the E Atlantic from the English S coast to S Africa. Records of *G. rhomboides* from the E Mediterranean are: coast of Argolis Province and of Methana Peninsula, Peloponnesos; Cyclades, Greece (Guérin 1832), NW of Crete, 35° 48'N 23° 34'E (Steindachner 1891, Adensamer 1898), near Khania, NW Crete (Lucas 1853, Raulin 1870), Sporades, 37° 37'N 26° 58'E (Adensamer 1898), Israel (Gottlieb 1953). Monod (1931) reported *Goneplax angulata* from the Gulf of Alexandretta (= Iskenderon), Turkey, while Balss (1936) mentioned that species from Alexandria, Egypt; it is not certain to which of the two forms these specimens belong.

Family OCYPODIDAE

Ocypode cursor (Linnaeus, 1758) (Plate III, figure 14)

Ocypoda cordimana Steinitz 1929, p. 79; Steinitz 1933, p. 153; Bodenheimer 1935, p. 468, plate 68, figure 9 (*O. longimana* on plate); Bodenheimer 1937, p. 281 (Not *Ocypode cordimana* Desmarest, 1825).

Ocypoda hippeus Aharoni 1944, p. 41.

Ocypoda cursor Gottlieb 1953, p. 440.

Ocypode cursor Carmin 1955, p. 2.

Material has been examined from : Caesarea (beach), Tel Aviv (11. and 25.V. and 12.X.1929, leg. J. Carmin), Jaffa (sandy beach, 1921, leg. P. A. Buxton, coll. British Museum), Bat Yam (28.V.1929, leg. J. Carmin), Nabi Rubin (1920, leg. I. Aharoni, coll. British Museum). Thirteen specimens were examined, their carapace length varying from 24 to 35 mm. The species is quite common all along the Israel coast. Steinitz' (1929, 1933) specimens, originating from near Haifa, were identified by that author with the Indo-West Pacific species *Ocypode cordimana* Desmarest; since all our *Ocypode* material belongs to *O. cursor*, a species which proves to be very common on the Israel sandy beaches and which has not been mentioned by Steinitz, it seems extremely probable that Steinitz' record is based on the present form. Carmin's (1955) record of the present species is largely based on the above Tel Aviv and Bat Yam material.

Ocypode cursor (also named *O. ippeus* or *O. hippeus*) inhabits the sandy shores of the E Mediterranean and those of the N and W coasts of Africa south to Angola. The records from the E Mediterranean are : beaches of Astros and Nisea near Megara, S Greece (Guérin 1832), Syria (Hasselquist 1757, Lamarck 1818), between Sidon and Tyre, Lebanon (Olivier 1802), Israel (Bodenheimer 1935, 1937, Aharoni 1944, Gottlieb 1953, Carmin 1955), Haifa, Israel (Steinitz 1929, 1933), Egypt (Hasselquist 1757, Lamarck 1818, Audouin 1826), near Alexandria, Egypt (Bals 1936). Specimens from Burlos Beach, Gharbies Province, Egypt (15.VI. 1916, leg. M. J. Nicoll) were examined in the British Museum (Natural History). Since ancient times this species is known from the E Mediterranean as is shown by Aristotle's remarks dealing with this species : "In the neighbourhood of Phoenice there are found on the beach certain crabs that are nicknamed the "horsemen", from their running with such speed that it is difficult to overtake them; these crabs, when opened, are usually found empty, and this emptiness may be put down to insufficiency of nutriment" (see Thompson, 1910, S 525 b, lines 7 to 10). The ancient Phoenicia occupied the narrow coastal strip of the N. part of present-day Israel (N of Mt. Carmel), the Lebanon and Syria, so that Aristotle's observations even may have been based on Israel specimens. The material collected on the coast of Syria by M. Labillardière, which Audouin (1826, p. 255) identified as *Ocypode rhombea*, in all probability belongs to *O. cursor*.

Family GRAPSIDAE

Pachygrapsus marmoratus(Fabricius, 1787) (Plate III, figure 15)

Pachygrapsus marmoratus Steinitz, 1933, p. 152; Bodenheimer, 1935, p. 468; Bodenheimer, 1937, p. 281; Gottlieb, 1953, p. 440; Carmin 1955, p. 2.

Material was examined from : Caesarea (rock pools, 3.IV.1951, 16.V. and 10.VI.1954, and 26.V.1955), Mediterranean coast of Israel (leg. J. Carmin). The spec-

imens have carapace lengths ranging from 11 to 30 mm. The species is very common in the Caesarea area from where it has already been reported by Gottlieb (1953). Steinitz (1933) mentioned it from Haifa. Carmin's (1955) record is based on the above material. According to Carmin the species appears in May or June in large numbers on the coast and can be found until December; Steinitz (1933) stated that it appears already in March. Carmin's remark that the species is often covered by seaweed probably is based on a mistake, since this species, like most Grapsids, have their body usually remarkably free from any growth.

Pachygrapsus marmoratus is known from the entire Mediterranean, the Black Sea, and the E. Atlantic between the Normandy coast of France in the north, and Morocco, the Canary Islands, the Azores and Madeira in the south. The records from the E Mediterranean are: Pylos, Sapienza and Marathonesi, S Greece (Guérin 1832, as *Grapsus varius*), Phaleron Bay near Athens, Greece (Athanasopoulos 1917, as *Grapsus varius*), Istanbul (Stimpson 1861), Gallipoli, Sea of Marmara (Ostroumoff 1896), Khania, NW Crete (Lucas 1853, Raulin 1870, both as *Grapsus varius*), Khos (=Coo), Sporades (Santucci 1928), Rhodes (Santucci 1928, Tortonese 1947), Cyprus (Heller 1863, Unger and Kotschy, 1865, as *Grapsus varius*), Israel (Bodenheimer 1935, 1937, Carmin 1955), Haifa (Steinitz 1933), Caesarea, Israel (Gottlieb 1953), Egypt (Audouin 1826, as *Grapsus varius*), Alexandria, Egypt (Balss 1936), Derna, Apollonia, Tolmeta and Benghazi, Cyrenaica (Colosi 1923). In the U.S. National Museum, Washington, D.C., E Mediterranean material of this species has been examined from Istanbul (IX.,X.1923, H.C. Kellers), and 1 mile off Mersa Matruh, Egypt (on rocks, 8.X.1950, R.E. Kuntz).

***Pachygrapsus transversus* (Gibbes, 1850)**

Pachygrapsus maurus Steinitz 1933, p. 152; Bodenheimer 1935, p. 468; Bodenheimer 1937, p. 281; Gottlieb 1953, p. 440.

Pachygrapsus transversus Carmin, 1955, p. 2.

The material examined originates from: Atlit (13.VI.1929, leg. J. Carmin), Caesarea (rock pools, 3.IV.1951, 19.III. and 10.VI.1952, 20.VI.1953, 26.V., 10 and 23.VI. 1954), Tel Aviv (11 and 21.V. and 29.VI. 1929, 3.I. 1930, 31.XII. 1931 and 5.VI.1932, leg. J. Carmin), Bat Yam (19.VI.1929, leg. J. Carmin), Mediterranean coast of Israel (leg. J. Carmin). On the Israel coast the species is far commoner than *Pachygrapsus marmoratus*. Twenty-eight specimens were examined (cl. 4 to 17 mm); an ovigerous female was found in June.

Steinitz, Bodenheimer and Gottlieb reported on this species under the name *P. maurus*, which, though it is a closely related species, is completely distinct. Steinitz' material came from Haifa, that of Gottlieb from Caesarea. Carmin's (1955) record of the species is mainly based on his above mentioned material.

Pachygrapsus transversus is an inhabitant of the E Atlantic (Mediterranean; Cape Blanco, Madeira and Canary Islands to Angola), W Atlantic (Massachusetts;

Bermuda and North Carolina to Uruguay), and E Pacific (California to Peru). The species is indicated generally as also inhabiting the Indo-West Pacific area (E Australia, New Zealand, Tahiti). In Australia the species has been reported from the coast of New South Wales, from Sydney north to Ballina. Holthuis in 1955 collected material of this form near Collaroy (Long Reef) and Mosman, both localities being slightly N of Sydney, N.S.W. Examination of these animals proved that they belong to a species which is perfectly distinct from *Pachygrapsus transversus* and which should be known as *Pachygrapsus laevimanus* Stimpson. Both the New Zealand and the Tahiti records of *P. transversus* were published by Kingsley (1880, p. 200), but not confirmed by later authors; Kingsley evidently did not even examine the Tahiti material himself as he did not provide that record with an exclamation mark. Chilton and Bennett (1929, p. 762), when reviewing the New Zealand Brachyuran fauna, considered the record of *Pachygrapsus transversus* from New Zealand as doubtful. It is impossible, therefore, to consider at the moment *Pachygrapsus transversus* as a species inhabiting the Indo-West Pacific area.

In the W. Mediterranean the species has been found only once, namely in Marseilles harbour, where it was taken from the bottom of a ship coming from Pondicherry via the Cape of Good Hope. In the E Mediterranean the species is well established, as is shown by the Israel material. It has also been reported from Port Said, Egypt (Calman 1927) and Alexandria (Balss 1936). The collection of the U.S. National Museum, Washington, D.C., possesses material of this species from Port Said (VI.1922, H.C. Kellers). Uncertainty exists as to whether the E Mediterranean range of *Pachygrapsus transversus* is connected with the W African or that it found its origin in an accidental introduction of the species.

Planes minutus (Linnaeus, 1758)

The collection of the Haifa Sea Fisheries Research Station contains a male (cl. 16 mm) which in all probability was taken at the Mediterranean coast of Israel, though definite locality data are lacking.

As shown by Chace (1951), *Planes minutus* is most abundant in the Atlantic Ocean between the equator and 50° N, though there are records from the S Atlantic, the Indian and the Pacific Oceans. In all probability, all of the Indo-Pacific material belongs to *Planes cyaneus* Dana. There are several records of *Planes minutus* from the Mediterranean, but only one from the eastern part: Cyprus (Heller 1863).

Brachynotus sexdentatus Risso, 1827) ssp.

Brachynotus sexdentatus Carmin 1955, p. 2; Forest, 1957, p. 503.

Brachynotus sexdentatus gemmellaroi Monod 1956, p. 434.

Material has been examined from : Mediterranean coast of Israel (leg. J. Carmin), Shikmona near Haifa (20.XII. 1954), Caesarea (rock pools, 16.VII. and 5.VIII. 1952, 10.VI.1953 and V.1954, leg. E. Gottlieb), Tel Aviv (11.V: 1929,

leg. J. Carmin). Thirteen specimens (cl. 2.5 to 11 mm) were examined, none of these being ovigerous. Carmin's (1955) record of this species is mainly based on the above specimens of his collection, that by Monod on the above Tel Aviv material, while Forest (1957) mentioned material from Caesarea.

Dr. Ricardo Zariquiey Alvarez of Barcelona informed Holthuis that in his Spanish material of *Brachynotus sexdentatus* two forms can be recognized, one being the true *B. sexdentatus* (Risso). The other differs from the typical form in several characters: it is smaller, the front is more deeply emarginate in the middle, the orbits are deeper, the ocular peduncle is broader and not pointed at the apex, the carapace shows some distinct ridges, which are not or only vaguely visible in the typical form, the propodus of the fifth leg is shorter and the dactylus of that leg is more strongly curved; furthermore, the last joint of the male abdomen is more quadrangular, being more or less triangular in the typical form, and the merus of the third maxilliped has the inner proximal and the outer distal corner about straight, being more rounded in the typical form. A direct comparison of our larger Israel specimens (those from Tel Aviv) with material of both Spanish forms showed it to belong to the atypical form, which it resembles in all respects. Our other Israel specimens evidently also belong to this second form but some are too small (cl. 2.5 to 4 mm) to decide this with certainty. It is hoped that Zariquiey's study on *Brachynotus* will soon be published.

Brachynotus sexdentatus (Risso) s. l. inhabits the entire Mediterranean and the Black Sea while it has penetrated into the Suez Canal as far as Lake Timsah; quite recently the species has been found in Swansea (Great Britain), where it evidently has been accidentally introduced (cf. Naylor, 1957). The specimens reported from the Atlantic coast of Morocco and Mauritania prove to belong to a distinct species, *B. atlanticus* Forest (cf. Forest, 1957). The records from the E Mediterranean are: near Khandia, NW Crete (Lucas 1853, H. Milne Edwards 1853, Raulin 1870), Cyprus (Heller 1863), Israel (Carmin 1955), Port Said, Egypt (Calman 1927, Fox 1927), Lake Menzaleh near Port Said (Calman 1927), Lake Timsah, Suez Canal (Calman 1927, Fox 1927; ? Tortonese 1952), near Alexandria, Egypt (Bals 1936). As to the distribution of the two forms, the typical form is known with certainty from Spain (Barcelona), S. France (Nice), Italy (Naples), Algeria (Algiers and Bône), and Great Britain (Swansea). Apart from Israel, the atypical form is only known with certainty from S. France (Racou, N. of Collioure), and from two localities in the province of Barcelona, NE Spain (Sitges to the south, and Arenys to the north of Barcelona).

Family PINNOTHERIDAE

Pinnotheres pisum (Linnaeus, 1767)

Six females (cl. 6 to 9 mm) were examined. Two of these originate from Acre (on beach, commensal in *Mactra corallina* (L.), 2.II.1955; on beach with shells of *Meleagrina albina* (Lam.), 12.XII.1955). The other four were collected in Haifa

Bay (II.1956), where they were found in *Macra*. Two of the Haifa Bay specimens (cl. 8 and 9 mm) are ovigerous. Furthermore, a male (cl. 5 mm) from the Mediterranean coast of Israel (exact locality not known) is present in the collection studied. The specimens agree well with Bouvier's (1940) account of this species.

Pinnotheres pisum inhabits the entire Mediterranean and the E Atlantic from Norway to Mauritania. The previous records of the species from the E Mediterranean are: Phaleron Bay near Athens, Greece (Athanasopoulos 1917), near Princes Islands (= Kizil Adalar), E Sea of Marmara (Ostroumoff 1896). Since Athanasopoulos found part of his specimens in *Pinna*, it is very well possible that his material partly or entirely belongs to *Pinnotheres pinnotheres* (L.).

Family PALICIDAE

Palicus caronii (P. Roux, 1830)

One specimen (cl. 6 mm) was collected in Haifa Bay (sample 107, depth 70 m), and one (cl. 10 mm) off Kfar Vitkin (sample 520, depth 90 m).

The name *Cymopolia caronii* has often been used for this species, but the generic name *Cymopolia* Roux, 1830 (Crust. Medit., p. 77) is preoccupied by *Cymopolia* Lamouroux, 1816 (Hist polyp. corall. flex., p. 292), as has already been pointed out by Rathbun (1897, p. 93), who correctly substituted *Palicus* Philippi (1838) for Roux' *Cymopolia*. The fact that Lamouroux' genus *Cymopolia* is an alga and not a polyp as Lamouroux thought, does not make *Cymopolia* Roux an available name. Article 1 of the International Rules of Zoological Nomenclature states that "if an organism is transferred from the animal to the vegetable kingdom its names retain their zoological status". *Cymopolia* Roux, 1830, therefore is invalid and has to be replaced by *Palicus* Philippi, 1838. It is to be regretted that Rathbun (1915, p. 180) returned to the use of *Cymopolia* Roux on the assumption that it could not be invalidated by the botanical *Cymopolia* Lamouroux.

Until now *Palicus caronii* was known only from the W Mediterranean, and from W Africa down to the Gulf of Guinea.

Family PARTHENOPIIDAE

Lambrus angulifrons (Latreille, 1825)

Three specimens (cl. 8 to 12 mm) were collected in Haifa Bay (sample 215, depth 30 m), and off Rafah (sample 544, depth 23 m).

The species inhabits the entire Mediterranean. The only previous record from the E Mediterranean is by Monod (1931), who reported it from the Gulf of Alexandretta (= Iskenderon), Turkey.

Lambrus macrochelos (Herbst, 1790)

Seven specimens (cl. 16 to 32 mm) from the following localities were examined: Haifa Bay (samples 233, 236, 277, 281; depths between 18 and 97 m), off Nabi Yunis (trawled, depth 146 m, 5.V.1953).

The species inhabits the entire Mediterranean and, furthermore, is known from the E Atlantic between Portugal and Angola. Records from the E Mediterranean are: Methana peninsula, Gulf of Aigina, S Greece (Guérin 1832, as *Lambrus mediterraneus*), Phaleron Bay near Athens, Greece (Athanasopoulos 1917, as *Lambrus mediterraneus*).

Lambrus massena Roux, 1830

Lambrus massena Gottlieb, 1953, p. 440.

Ten specimens (cl. 7 to 14 mm) were collected off Nahariya (sample 552), and in Haifa Bay (samples 79, 92, 191, 239, 241, 289, 297), at depths between 35 and 79 m. The only ovigerous female (cl. 10 mm) was collected in June (sample 239).

The species is known from the entire Mediterranean and from the E Atlantic between the Brittany coast of France and the Congo. E Mediterranean records are: near Kalolimno (=Imralü) Island, Sea of Marmara (Ostroumoff 1896), Israel (Gottlieb 1953).

Family MAJIDAE

Maja squinado (Herbst, 1788)

Maja squinado Gottlieb 1953, p. 440.

Two specimens (cl. about 80 mm) trawled in V.1953 off Nabi Rubin at a depth of 146 m (coll. Institute of Natural Sciences, Oranim). It is on these specimens that Gottlieb's (1953) record is based.

Maja squinado is known from the entire Mediterranean and from the E Atlantic between the British Isles and French Guinea. Records from the E Mediterranean are: Syros, Cyclades (Guérin 1832), Athens market (Athanasopoulos 1917), Bosphorus (Ninni 1923), Crete (Lucas 1853, Raulin 1870), Rhodes (Tortonese 1947, 1947a), Syria (Gravel 1928, 1931, Monod 1931), Israel (Gottlieb 1953), Egypt (Gravel 1928), Tolmeta, Cyrenaica (Colosi 1923). The U. S. National Museum, Washington, D. C., possesses E Mediterranean material of this species from Greece (old collection) and Istanbul (IX.—X.1923, H. C. Kellers).

Maja verrucosa H. Milne Edwards, 1834

A male (cl. 38 mm) was collected on 14.1.1954 at the Haifa coast (coll. Institute of Natural Sciences, Oranim). A female (cl. 37 mm) from the Mediterranean coast of Israel is in the collection of the Tel Aviv Institute of Natural Science.

Maja verrucosa inhabits the entire Mediterranean and the E Atlantic from Portugal to Mauritania and the Cape Verde Islands. Records from the E Mediterranean are: Syros and Naxos, Cyclades (Guérin 1832), Phaleron Bay near Athens, Greece (Athanasopoulos 1917), Bosphorus (Ninni 1923), S end of the Bosphorus, near Princes Islands (=Kizil Adalar), and near San Stefano, E Sea of Marmara (Ostrou-

moff 1896), Khos (=Coo), Sporades (Santucci 1928), Rhodes (Parisi 1913, Tortonese 1947), Crete (Lucas 1853, Raulin 1870), Egypt (Audouin 1826).

Maja goltziana Oliveira, 1888 (Plate III, figure 16)

A male (cl. 40 mm) was collected on the Mediterranean coast of Israel by L. Fishelson and C. Levinson, it is preserved dry and was donated by the Institute of Natural Science at Tel Aviv to the Rijksmuseum van Natuurlijke Historie, Leiden.

By the presence of a very strong antero-dorsal spine on the meri of the walking legs, the species may immediately be distinguished from *Maja squinado* and *M. verrucosa*. Also, the arrangement of the spines on the carapace differs distinctly from that of the two other species. The five spines of the median line of the carapace, are far longer and slenderer than in *M. squinado* and *M. verrucosa* where they are low and look more like sharply topped tubercles. In *M. goltziana* there are two slender spines placed between the median line of the carapace and the last of the antero-lateral spines; in the two other species only one spine is present there. The legs of the species are more slender than in *M. squinado*, rather resembling those of *M. verrucosa*.

M. goltziana is closely related to *M. spinigera* De Haan, a species until now only known from Japan. A comparison of our Israel specimen of *M. goltziana* with the types of *M. spinigera* showed the following differences. The distance between the third and fourth median spine of the carapace (counted from the rostrum backwards) in *M. goltziana* is smaller than the distance between the second and the third, in *M. spinigera* the second and the third spine are placed far closer together than the third and fourth. As already remarked above, in *M. goltziana* two slender spines are placed on the carapace between the last antero-lateral tooth and the median line of spines, in *M. spinigera*, however, three such spines are found there. Of the two teeth in which ends the basal antennal segment, in *M. goltziana* the outer is slightly longer than the inner, while in *M. spinigera* the inner is distinctly longer than the outer. The postero-external lobe at the base of the basal antennal segment, which forms part of the orbit, is strongly pointed in *M. spinigera* and in *M. squinado*, it is truncated in *M. verrucosa* and rounded in *M. goltziana*.

M. goltziana is now, for the first time, reported from the Mediterranean. It was known only from specimens collected at different localities off the Portuguese coast and off the W African coast (from French Guinea to French Congo).

Pisa muscosa (Linnaeus, 1758)

Pisa ?armata Gottlieb, 1953, p. 440.

Three specimens of this species (cl. 7-25 mm) have been examined by us. They originate from the following localities: Haifa Bay (samples 224 and 298), Mediterranean coast of Israel (further data unknown). They were dredged at depths between 27 and 33 m.

There has been much difference of opinion about the status of the *Pisa* species belonging to the *tetraodon* group. Pesta (1918, p. 338) considered *Pisa tetraodon* (Pennant, 1777) as one large variable species, which he did not subdivide. Bouvier (1940, p. 330) recognised two forms in this species: forma *tetraodon* (Pennant, 1777) and forma *corallina* (Risso, 1816), the former being the broad, the latter the slender form. Zariquiey (1956, p. 406) elevated the slender form to the rank of a full species. A study of an extensive material convinced us of the correctness of Zariquiey's ideas and we even think it necessary to distinguish a third species in this group. As to the nomenclature, the name *Pisa tetraodon* (Pennant, 1777) may be kept for the broad form, the slender form should be named *Pisa muscosa* (Linnaeus, 1758), while the name *Pisa corallina* (Risso, 1816) is the correct name for the third species, which is more or less intermediate between the other two. A more elaborate discussion of the problem will be published in the near future by Zariquiey and Forest.

All the Israel specimens examined by us prove to belong to the slender form and thus have to bear the name given above.

Due to the confusion regarding the systematic status of this and the two related species, the records given in the literature cannot be relied upon. Under the name *Pisa tetraodon* specimens have been reported from: near Tekirdagh (=Rodosto), and near the S coast of Marmara Island, Sea of Marmara (Ostroumoff, 1896), Khos (=Coo), Sporades (Santucci, 1928), near Khania, N.W. Crete (Lucas, 1853; Raulin, 1870), St Georges Bay, Beirut, Lebanon (Monod, 1931), near Alexandria, Egypt (Balss, 1936); under the name *Pisa intermedia* Nardo from: Tekirdagh (=Rodosto), Sea of Marmara (Ostroumoff, 1896); and under the name *Pisa corallina* from: Phaleron Bay near Athens, Greece (Athanasopoulos, 1917), S end of Bosphorus, and E coast of Aphisia Island, Sea of Marmara (Ostroumoff, 1896). *Pisa intermedia* Nardo, 1869, is synonymous with *P. corallina* (Risso). The latter name, however, has been used by several authors for the slender form indicated here as *P. muscosa* and not for the true *P. corallina*. The present species was first recorded from Israel by Gottlieb (1953), whose specimen, a juvenile (cl. 7 mm) of which no other data are known than that it was collected on the Mediterranean coast of Israel, was referred by him with some doubt to *P. armata*.

***Pisa nodipes* Leach, 1815**

Pisa nodipes Gottlieb, 1953, p. 440.

Four specimens have been examined by us: two (cl. 28 and 31 mm) were collected at the Mediterranean coast of Israel (other data unknown), a male (cl. 22 mm) was caught with a bottom sampler off Nahariya (sample 1034, depth 18 m), and a male (cl. 27 mm) was taken with a trawl in Haifa Bay (9.IV.1946).

The species is found in the entire Mediterranean and in the E Atlantic between Portugal and the Cape Verde Islands. The only records from the E Mediterranean known to us are: Israel (Gottlieb 1953), near Alexandria, Egypt (Balss 1936).

Eurynome aspera (Pennant, 1777)

Eight specimens (cl. 3 to 16 mm) were collected: Haifa Bay (samples 107, 191, 233, 263, 338), off Kfar Vitkin (sample 618); they were obtained at depths between 49 and 93 m.

The species is known from the entire Mediterranean and from the E Atlantic between W Norway and the Gulf of Guinea. E Mediterranean records are: S end of the Bosphorus, near Princes Islands (= Kizil Adalar), and near Marmara Island, Sea of Marmara (Ostroumoff 1896), near Alexandria, Egypt (Balss 1936).

Acanthonyx lunulatus (Risso, 1816)

Acanthonyx lunulatus Steinitz 1933, p. 149; Bodenheimer 1937, p. 281; Gottlieb 1953, p. 440.

Acanathonyx lunulatus Carmin 1955, p. 2.

Extensive material of this species (79 specimens, cl. 4 to 16 mm) has been examined; it was collected at: Caesarea (rock pools, on weeds, 3.IV.1951, 23.I., 6.III., 10.VI., 16.VII., 4. and 5.VIII.1952, and 26.V.1954), Tel Aviv (7.VIII.1929, 3.I., 12.III., 9 and 26.V., and 2.IX. 1930, leg. J. Carmin), Bat Yam (19.IV.1929, leg. J. Carmin). Ovigerous females were collected in April and August. Carmin's (1955) record is based mainly on the above Tel Aviv and Bat Yam material.

The species is known from the entire Mediterranean and from the E Atlantic between Portugal and Camerouns. E. Mediterranean records are: Pylos and Sapienza, S Greece (Guérin 1832), Soudha Bay, NW Crete (Lucas 1853, Raulin 1870), Rhodes (Santucci 1928, Tortonese 1947), Israel (Bodenheimer 1937, Gottlieb 1953, Carmin 1955), Haifa (Steinitz 1933), Caesarea, Israel (Gottlieb 1953), near Alexandria, Egypt (Balss 1936). The Museum of the Academy of Natural Sciences at Philadelphia, U.S.A., possesses 7 dry specimens from Greece (Expedition Morée, 1830, Guérin coll. no. 37, T. B. Wilson), which evidently form all or part of the material reported upon by Guérin (1832).

Inachus dorsettensis (Pennant, 1777)

Inachus dorsettensis Gottlieb, 1953, p. 440.

Seventeen specimens of this species (cl. 4 to 16 mm) were collected at the following localities: Haifa Bay (April 9, 1946; samples 110, 191, 200, 233, 241, 276, 279, and 373), off Nabi Yunis (depth 146 m, May 5, 1933). The Haifa Bay material was taken at depths between 49 and 88 m. Seven ovigerous females are present (cl. 7 to 10 mm), they were collected in the months April, June, and August (samples 110, 191, 276).

Apart from the above material which belongs to the typical *Inachus dorsettensis*, the present collection contains six specimens (cl. 6 to 13 mm) of a broad form, which sometimes has been indicated with the name *Inachus dorsettensis mauritanicus* Lucas. These specimens were all collected in Haifa Bay (samples 91, 108,

209, and 279); they were taken at depths ranging between 26 and 57 m. Two of them are ovigerous (cl. 11 and 13 mm), being collected in the months April and May (samples 91 and 209).

The species is known from the entire Mediterranean and from the E Atlantic between Norway and S. Africa. E Mediterranean records are: Cape Tainaron, S Greece (Guérin 1832, as *I. scorpio*), NW of Crete, 36° 3'N 23° 6'E (Adensamer 1898), Tenos, Cyclades (Guérin 1832, as *I. scorpio*), near S end of Bosphorus, Sea of Marmara (Ostroumoff 1896, as *I. scorpio*), Gulf of Alexandretta (= Iskenderon), Turkey (Monod 1931), Israel (Gottlieb 1953), near Alexandria, Egypt (Balss 1936).

Macropodia rostrata (Linnaeus, 1761)

Twenty-one specimens (cl. 6 to 16 mm) have been examined from: Mediterranean coast of Israel (further data unknown), off Nahariya (sample 553), Haifa Bay (samples 108, 180, 223, 241, 330, 352, 353, 388), off Atlit (sample 509). They were collected at depths between 27 and 55 m. The six ovigerous females (cl. 6 to 13 mm) of this collection were taken in January, June and July (samples 353, 509, 553). Two specimens of sample 509 carried a Rhizocephalan parasite under the abdomen.

Macropodia rostrata inhabits the entire Mediterranean, the Black Sea, and the E Atlantic between the Murman coast and S Africa. E Mediterranean records are: Methone (=Modon) Bay, and Marathonesi Island, Lakonia Bay, S Greece (Guérin 1832, as *Stenorhynchus phalangium*), near S end of the Bosphorus, and near Princes Islands (=Kizil Adalar), E Sea of Marmara (Ostroumoff 1896, as *Stenorhynchus phalangium*), Ras Beirut, Lebanon (Monod 1931) near Alexandria, Egypt (Balss 1936).

Macropodia longirostris (Fabricius, 1775)

Macropodia longirostris Steinitz, 1933, p. 148; Bodenheimer, 1935, p. 466; Bodenheimer, 1937, p. 281.

The insertion of this species in the list of Israel Decapoda is solely based on Steinitz' above record. All Israel representatives of this genus examined by us belong either to *M. rostrata* or to *M. longipes*. Steinitz' material probably was collected in Haifa Bay.

The species has been reported from the entire Mediterranean, the Black Sea and the E Atlantic between the Faeroes and Senegal. E Mediterranean records are: Phaleron Bay near Athens, Greece (Athanasopoulos, 1917), E part of Sea of Marmara, near Princes Islands (=Kizil Adalar), near Kalikratia, near Tekirdagh (=Rodosto), and near Aphisia Island, Sea of Marmara (Ostroumoff, 1896, as *Stenorhynchus longirostris* and *S. aegyptius*), Ras Beirut, Lebanon (Monod, 1931), Israel (Bodenheimer, 1935, 1937), Haifa, Israel (Steinitz, 1933), Egypt (Audouin, 1826, as *Stenorhynchus phalangium*; H. Milne Edwards, 1834, as *Steno-*

rynchus égyptius), near Alexandria, Egypt (Balss, 1936). A syntype of *Stenorynchus égyptius* H. Milne Edwards, 1834, is present in the collection of the Rijksmuseum van Natuurlijke Historie at Leiden. The specimen, which was collected in Egypt, proves to be a typical *Macropodia longirostris* (Fabr.).

Macropodia longipes (A. Milne Edwards and Bouvier, 1894)

Macropodia longirostris Gottlieb, 1953, p. 440.

Five specimens of this species (cl. 12 to 18 mm) were collected at the following localities: Haifa Bay (trawl, 9.IV.1946), off Nabi Yunis (depth 146 m, 5.V.1953).

Until now *Macropodia longipes* has only been reported from the French and Spanish coasts of the W Mediterranean; it was not yet known from the E Mediterranean.

IV. THE DISTRIBUTION OF THE DECAPOD CRUSTACEA
OF THE MEDITERRANEAN COAST OF ISRAEL

The Decapoda of the Mediterranean coast of Israel may be divided into two main components: the Atlantic element and the Indo-West Pacific. The Atlantic component is by far the larger of the two, consisting of 101 of the 117 species (36 Macrura, 20 Anomura and 45 Brachyura). Most of these species (33 Macrura, 18 Anomura and 40 Brachyura) inhabit the entire Mediterranean, generally penetrating into the E Atlantic and sometimes into the Black Sea. A second category, consisting of 2 Macrura, 2 Anomura and 4 Brachyura, is entirely or practically entirely absent in the European part of the Mediterranean, occurring in the E Atlantic, along the N African coast and along the coasts of Israel and Syria; a very good example is *Ocypode cursor*, which seems to be very common on the W and N coast of Africa, going eastwards as far as Egypt, Israel and Syria. Apart from an old record from Greece (Guérin 1832) this very conspicuous and characteristic species has not been mentioned at all from the European shores of the Mediterranean. The distribution of *Albunea carabus* is very similar (W Africa, Algeria, Israel, with an old record (Rafinesque 1814) from Sicily and one from Menorca). In this second category the species *Athanas amazone*, *Salmoneus jarli*, *Munida curvimana*, *Micropanope rufopunctata*, *Maja goletziana* and *Pachygrapsus transversus* have also to be placed, since they are known from the E Atlantic (various localities between Portugal and the Gulf of Guinea) and from Israel, in a few cases (*Micropanope* and *Pachygrapsus*) also being known from Egypt; some of these species (*Athanas*, *Salmoneus*, *Micropanope*) are small and may easily escape notice, so that it is possible that they may be found eventually in the N Mediterranean and thus actually belong to the first category. The new species *Automate branchialis* is also ranged under the Atlantic elements since it is far closer related to the Atlantic than to the Indo-West Pacific species of the genus; as so little is known about the distribution of this species, it cannot at the moment be placed in either of

the two above mentioned categories. Another Atlantic species which forms a category in itself is *Callinectes sapidus*, an American Brachyuran, which has unintentionally been introduced into Israel waters.

The Indo-West Pacific component of the Israel Mediterranean Decapod fauna consists of 16 species (9 Macrura, 7 Brachyura). All of these species obviously are recent immigrants which arrived in the Mediterranean by way of the Suez Canal.

V. APPENDIX

LIST OF THE SPECIES OF MARINE DECAPOD CRUSTACEA REPORTED FROM THE MEDITERRANEAN, EAST OF 20° E.

Suborder MACRURA

Family SERGESTIDAE

Sergestes arcticus Kröyer 1855

Under the name "*Sergestes arachnipodus* De Nat." Ostroumoff (1896 p. 67) reported a species from near Kalolimno (=Imrali) Island, Sea of Marmara. It is generally supposed that *Sergestes arachnipodus* (Cocco) De Natale is identical with *Sergestes arcticus*, but this is not entirely certain. Ostroumoff's record therefore is somewhat doubtful. According to Hansen (1922, p. 73) *S. arcticus* occurs in the Mediterranean to the west of 6°E.

Sergestes tenuiremis Kröyer 1855

Eastern basin of the Sea of Marmara (Ostroumoff 1896). Hansen (1922, p. 90 does not mention this species from the Mediterranean.

Sergestes robustus Smith 1882

South of Crete, 35° 8' N 24° 4'E (Adensamer 1898).

Sergestes corniculum Kröyer 1855 (See p. 13)

Sergestes vigilax Stimpson 1860

E Mediterranean, 32° 41' — 38° 11' N 19° 44' — 33° 35' E (König 1895, as *Sergia Clausi* König, and *Sergestes ocellatus* Kröyer).

Lucifer typus H. Milne Edwards 1837 (See p. 14)

Lucifer hanseni Nobili 1905

Port Said, Egypt (Balss 1927, Gurney 1927, Fox 1927a), Suez Canal near Kabret (Balss 1927, Gurney 1927, Fox 1927a). According to Balss, the identification of this material is not certain.

Family PENAEIDAE

Solenocera membranaceum (Risso 1816) (See p. 14)

Gennadas elegans (Smith 1882)

Sea of Marmara, 40° 48' N 27° 59' E; Gulf of Korinthos, Greece, 38° 10' N 22° 33' E; Sporades, 37° 52' N 26° 22' E E of Rhodes, 35° 59' N 28° 14' E; N of Egypt, 32° 31' N 26° 51' E (Stephensen 1923).

Aristeus antennatus (Risso 1816) (see p. 14)

Aristaeomorpha foliacea (Risso 1827) (See p. 15)

Penaeus kerathurus (Forsk. 1775) (See p. 15)

Penaeus japonicus Bate 1888 (See p. 16)

Penaeus semisulcatus De Haan 1844 (See p. 16)

Parapenaeus longirostris (Lucas 1846) (See p. 18)

Metapenaeus stebbingi Nobili 1904

Syria and Egypt (Gravel 1928), Port Said, Egypt (Balss 1927, Fox 1927a, Monod 1930, 1931, Gravel 1931, 1936, Burkenroad 1934), Suez Canal (Krukenberg 1888, Balss 1927, Fox 1927a, Gurney 1927, Gravel 1936, Monod 1937, Holthuis 1936), Bay of Abukir near Alexandria, Egypt (Balss 1936).

Metapenaeus monoceros (Fabricius 1798) (See p. 19)

Trachypenaeus curvirostris (Stimpson 1860) (See p. 20)

Sicyonia carinata (Brünnich 1768) (See p. 22)

Family O P L O P H O R I D A E

Acanthephyra pelagica (Risso 1816)

Off Turkey, 35° 59'N 28° 14'E (Stephensen 1923, as *A. multispina*),

Acanthephyra eximia Smith 1884

W of Crete, 35° 26'N 23° 18'E; S of Crete, 34° 45'N 24° 23'E and 35° 4'N 24° 17'E; N of Egypt, 31° 39'N 28° 52'E; off Cyrenaica, 33° 11'N 22° 23'E and 33° 4'N 21° 16'E (Adensamer 1898, as *A. pulchra*).

Family N E M A T O C A R C I N I D A E

Nematocarcinus ensifer (Smith 1882)

W. of Crete, 35° 26'N 23° 18'E; N of Crete 35° 59'N 25° 8'E; S of Crete, 34° 42'N 25° 14'E; off Cyrenaica, 33° 4'N 21° 16'E (Adensamer 1898).

Family P A S I P H A E I D A E

Pasiphaea multidentata Esmark 1866

Off SW Turkey, 35° 59'N 28° 14'E (Stephensen 1923).

~~*Pasiphaea sivado* (Risso 1816)~~

Pasiphaea sivado (Risso 1816)

Gulf of Korinthos, Greece, 38° 10'N 22° 35'E (Stephensen 1923), Sapienza and Astros, S Greece; Naxos, Cyclades (Guérin 1832), Sea of Marmara, 40° 48'N 27° 54'E; Sporades, 37° 52'N 26° 22'E (Stephensen 1923).

Leptochela aculeocaudata Paulson 1875

Near Alexandria, Egypt (Balss 1936).

Leptochela pugnax De Man 1916 (See p. 22)

Family P A L A E M O N I D A E

Palaemon (Palaemon) adpersus Rathke 1837 (See p. 23)

Palaemon (Palaemon) longirostris H. Milne Edwards 1837 (See p. 23)

Palaemon (Palaemon) xiphias (Risso 1827) (See p. 24)

Palaemon (Palaemon) serratus (Pennant 1777) (See p. 24)

Palaemon (Palaemon) elegans Rathke 1837 (See p. 25)

Brachycarpus biunguiculatus (Lucas 1846) (See p. 26)

Palaemonella vestigialis Kemp 1922 (See p. 26)

Periclimenes (Periclimenes) scriptus (Risso 1822)

Cephalonia Island, W Greece (Heller 1863).

Periclimenes (Harpilius) calmani Tattersall 1921

Port Said, Egypt (Balls 1927, Fox 1927a, Gurney 1927a), also in the Suez Canal in Lake Timsah and at Kabret (Balss 1927, Gurney 1927, 1927a, Fox 1927a) and in the Great Bitter Lake (Holthuis 1956).

Pontonia pinnophylax (Otto 1821)

Sapienza, S. Greece (Guérin 1832, as *P. custos*), Greece, (Sharp 1893, as *P. custos*)

Rhodes (Santucci 1928, as *P. custos*), Smyrna (=Izmir), W Turkey (Hasselquist 1757).

In the Museum of the Academy of Natural Sciences at Philadelphia, U.S.A. there are 7 specimens labelled Greece (Guérin coll. no. 338, T. B. Wilson); these evidently are Guérin's (1832) and Sharp's (1893) specimens.

Typton spongicola Costa 1844 (See p. 27)

Family ALPHEIDAE

Athanas nitescens (Leach 1814) (See p. 27)

Athanas amazone Holthuis 1951 (See p. 32)

Automate branchialis n.sp. (See p. 34)

Salmoneus ? jarli (Holthuis 1951) See p. 39)

Alpheus glaber (Olivi 1792) See p. 40)

Alpheus macrocheles (Hailstone 1835)

Sporades, 37° 37'N 26° 58'E (Adensamer 1898).

Alpheus dentipes Guérin 1832 (See p. 41)

Alpheus crassimanus Heller 1862

Alexandria, Egypt (Balss 1936), Suez Canal (Gravel 1936, Monod 1937). Forest and Guinot (1956) mentioned the species from Sfax, Tunisia.

Alpheus audouini Coutière 1905 (See p. 41)

Alpheus inopinatus n.sp. (See p. 42)

Synalpheus gambarelloides (Nardo 1847) (See p. 48)

Family OGYRIDIDAE

Ogyrides mjobergi (Balss 1921) (See p. 48)

Family HIPPOLYTIDAE

Hippolyte inermis Leach 1815

Peloponnesos, Greece (Guérin 1832, as *Hippolytus brullei*; Sharp 1893, as *Virbius viridis*) Ras Beirut and St. George's Bay, Beirut, Lebanon (Monod 1931, as *H. prideauxiana*), near Alexandria, Egypt (Balss 1936, as *H. prideauxiana*).

A type specimen of *Hippolytus brullei* Guérin from Greece is preserved in the collection of the Philadelphia Academy of Natural Sciences; the specimen has also been mentioned by Sharp (1893).

Hippolyte longirostris (Czerniavsky 1869) (See p. 51)

Thoralus cranchii (Leach 1817) (See p. 51)

Family PROCESSIDAE

Processa canaliculata Leach 1815 (See p. 52)

Processa edulis (Risso 1816)

Near the islands of Marmara and Aphisia, and near Gallipoli, Sea of Marmara (Ostroumoff 1896), Naxos, Cyclades and several other, not specified localities in S Greece (Guérin 1832), Sporades, 36° 47'N 26° 29'E (Adensamer 1898), Mediterranean coast of Egypt (Kaiser 1889). All records are under the name *Nika edulis*; they may be based on any of the 8 European species of *Processa*.

Processa elegantula Nouvel and Holthuis 1957

The Station Marine d'Endoume at Marseilles recently donated to the Rijksmuseum van Natuurlijke Histoire at Leiden a specimen of this species from off Lividia Point, Kalamata Gulf, Greece, 36° 46' 15" N 21° 59' 20" E, depth 63 m, IX.1955, Cruise of the "Calypto" Sta. 725.

Family PANDALIDAE

Plesionika edwardsii (Brandt 1851) (See p. 53)

Plesionika martia (A. Milne Edwards 1883)

E of the Peloponnesos, Greece, $36^{\circ} 58'N 24^{\circ} 18'E$ and $36^{\circ} 40'N 23^{\circ} 52'E$; NW of Crete, $35^{\circ} 59'N 22^{\circ} 56'E$, $35^{\circ} 48'N 23^{\circ} 34'E$ and $35^{\circ} 45'N 23^{\circ} 11'E$; N of Crete, $36^{\circ} 9'N 25^{\circ} 50'E$; Sporades, $36^{\circ} 47'N 26^{\circ} 29'E$, and $36^{\circ} 37'N 26^{\circ} 43'E$; N of Cyrenaica, $33^{\circ} 56'N 22^{\circ} 56'E$ (Adensamer 1898).

Plesionika acanthonotus (Smith 1882)

NW of Crete, $36^{\circ} 19'N 23^{\circ} 16'E$ (Adensamer 1898, as *Pandalus geniculatus*).

Plesionika heterocarpus (Costa 1871)

Off the S coast of Marmara Island, Sea of Marmara (Ostroumoff 1896), E of the Peloponnesos, $36^{\circ} 59'N 24^{\circ} 29'E$ (Adensamer 1898).

Pandalina brevirostris (Rathke 1843)

E of the Peloponnesos, $36^{\circ} 59'N 24^{\circ} 29'E$ (Adensamer 1898).

Chlorotocus crassicornis (Costa 1871) (See p. 53)

Icotopus amplissimus Coutière 1907 (See p. 53)

Family CRANGONIDAE

Crangon crangon (Linnaeus 1758)

Phaleron Bay near Athens, Greece (Athanasopoulos 1917, as *C. vulgaris*), Istanbul fish market (Ninni 1923).

Pontophilus spinosus (Leach 1815)

NW of Crete, $35^{\circ} 59'N 22^{\circ} 56'E$; E of the Peloponnesos, Greece, $37^{\circ} 0'N 24^{\circ} 28'E$, $36^{\circ} 59'N 24^{\circ} 29'E$; Sporades, $39^{\circ} 28'N 25^{\circ} 37'E$, $36^{\circ} 47'N 26^{\circ} 29'E$, and $36^{\circ} 37'N 26^{\circ} 43'E$ (Adensamer 1898).

Pontophilus bispinosus Westwood 1835 (See p. 54)

Pontocaris cataphracta (Olivi 1792) (See p. 53)

Family POLYCHELIDAE

Polycheles typhlops Heller 1862

E of the Peloponnesos, Greece, $36^{\circ} 40'N 23^{\circ} 52'E$; NW of Crete, $36^{\circ} 19'N 23^{\circ} 16'E$, and $35^{\circ} 48'N 23^{\circ} 34'E$ (Steindachner 1891, Adensamer 1898), NW of Crete, $35^{\circ} 56'N 22^{\circ} 55'E$; N of Crete, $36^{\circ} 23'N 24^{\circ} 11'E$ (Adensamer 1898), S of Crete, $34^{\circ} 45'N 24^{\circ} 23'E$ (Steindachner 1891), off SW Turkey, $36^{\circ} 33'N 28^{\circ} 59'E$; N of Egypt, $32^{\circ} 22'N 31^{\circ} 45'E$ (Adensamer 1898); W of Alexandria, $31^{\circ} 39'N 28^{\circ} 52'E$; N of Cyrenaica, $33^{\circ} 56'N 22^{\circ} 56'E$ (Steindachner 1891, Adensamer 1898), N of Cyrenaica, $33^{\circ} 11'N 22^{\circ} 23'E$ (Adensamer 1898).

Family PALINURIDAE

Palinurus elephas (Fabricius 1787)

Aristotle (see Thompson, 1910, §549b, lines 17-18, under crawfish, *Palinurus vulgaris*) mentioned this species from Greece: "crawfish in the neighbourhood of Sigeum and Mount Athos". Other records from the E Mediterranean are: Sea of Marmara (Thompson 1912, Ninni 1923), Skiathos, N Sporades (Thompson 1912), Skyros and Kyra Panaghia, N Sporades (Athanasopoulos 1926), Syros, Cyclades (Guérin 1832, as *P. locusta*; Thompson 1912), Possedimento and Furni near Samos (Maldura 1938), Levita, Patmos (=Patmo), Calchi Lerò (=Lero), Kos (=Coo), and Episkopi (=Piscopi), Sporades (Maldura 1938), Calchi (Maldura 1938, Tortonose 1947), Smyrna (=Izmir), Turkey (Calman 1912). As pointed out by Gruvel (1928, p. 45; 1929, p. 1698; 1930, p. 38; 1931, p. 115) and Bodenheimer (1935, p. 466), this species does not occur along the coasts of Syria, Israel, and Egypt.

Family SCYLLARIDAE

Scyllarus arctus (Linnaeus 1758) (Seep. 54)

Scyllarides latus (Latreille 1803) (See p. 55)

Family NEPHROPSIDAE

Nepbrops norvegicus (Linnaeus 1758)

Phaleron Bay near Athens, Greece (Athanasopoulos 1917), Egypt (Holthuis 1945).

Homarus gammarus (Linnaeus 1758)

Aristotle (see Thompson 1910, §549b, lines 16-17, under lobster, *Homarus vulgaris*) recorded the species from Greece: "in the Hellespont [=Dardanelles] and on the coast of Thasos". Other records from the E Mediterranean are: Bosphorus (Ninni 1923), Sea of Marmara (Thompson 1912, Ninni 1923), Skiathos, N Sporades (Thompson 1912), Skyros, N Sporades (Athanasopoulos 1926), market of Athens (Athanasopoulos 1926), Syros, Cyclades (Thompson 1912), Smyrna (=Izmir), Turkey (Calman 1912). According to Maldura (1938) the species does not occur near Rhodes, while Gruvel (1928, 1929, 1930, 1931) and Bodenheimer (1935, p. 466) point to its absence from the Syrian, Israel and Egypt coasts. Three small specimens from Istanbul (no date; G. P. Marsh) are in the collection of the U.S. National Museum, Washington D.C.

Family LAOMEDIIDAE

Jaxea nocturna Nardo 1847 (See p. 55)

Family CALLIANASSIDAE

Callianassa minor Gourret 1887 (See p. 56)

Callianassa tyrrhena (Petagna 1792) (See p. 62)

Callianassa subterranea (Montagu 1808)

Phaleron Bay near Athens, Greece (Athanasopoulos 1917), Benghazi, Cyrenaica (Colosi 1923). The very confused state of the systematics of *Callianassa* makes it quite doubtful whether the specimens on which these records are based, are correctly identified with Leach's species.

Upogebia deltaura (Leach 1815) (See p. 66)

Upogebia pusilla (Petagna 1792).

Gulf of Argolis (=Argos) off Nauplion (=Napoli de Romanie), Greece (Guérin 1832, as *Gebia littoralis*), Crete (Lucas 1853, Raulin 1870, both as *Gebia* (*Thalassina littoralis*), Suez Canal (Monod 1937), near Alexandria, Egypt (Balss 1936).

Upogebia tipica (Nardo 1869) (See p. 65)

Suborder ANOMURA

Family PAGURIDAE

Paguristes oculatus (Fabricius 1775) (See p. 67)

Clibanarius erythropus (Latreille 1818) (See p. 67)

Calcinus ornatus (P. Roux 1830) (See p. 68)

Diogenes pugilator (P. Roux 1829) (See p. 68)

Dardanus arrosor (Herbst 1796) (See p. 69)

Dardanus callidus (Risso 1827) (See p. 69)

Pagurus bernhardus (Linnaeus 1758)

Peloponnesos, Greece (Guérin 1832). This record probably is based on specimens of a different species, possibly *P. prideauxi* Leach.

Pagurus sculptimanus Lucas 1846 (See p. 70)

Pagurus spinimanus Lucas 1846 (See p. 70)

Pagurus alatus Fabricius 1775 (See p. 71)

Pagurus prideauxi Leach 1815 (See p. 71)

Pagurus anachoretus Risso 1827 (See p. 71)

Catapaguroides timidus (P. Roux 1830) (See p. 72)

Anapagurus laevis (Bell 1846) (See p. 72)

Anapagurus bicorniger A. Milne Edwards and Bouvier 1892 (See p. 73)

Family GALATHEIDAE

Galathea intermedia Lilljeborg 1851 (See p. 73)

Galathea strigosa (Linnaeus 1761)

Cape Tainaron and Marathonesi, S Greece (Guérin 1832), Rhodes (Tortonesi 1947).

Galathea squamifera Leach 1814 (See p. 73)

~~*Galathea squamifera* Leach 1814 (See p. 73)~~

S end of Bosphorus, and near Marmara Island, Sea of Marmara (Ostroumoff 1896).
Sporades, 37° 37'N 26° 58'E (Adensamer 1898), Gulf of Alexandretta (=Iskenderon),
Turkey (Monod 1931).

Munida rugosa (Fabricius 1775)

E of the Peloponnesos, Greece, 36° 58'N 24° 18'E and 36° 59'N 24° 29'E (Adensamer 1898, as *M. bamffica*), near Marmara Island, Sea of Marmara (Ostroumoff 1896).

Munida tenuimana Sars 1871

Near Ocsia, E Sea of Marmara (Ostroumoff 1896).

Munida curvimana A. Milne Edwards and Bouvier 1894 (See p. 74).

Family PORCELLANIDAE

Porcellana longicornis (Linnaeus 1767) (See p. 76)

Porcellana platycheles (Pennant 1777) (See p. 77)

Petrolisthes boscii (Audoin 1826)

Pylos, Methone (=Modon), and Gulf of Argolis (=Argos), S Greece (Guérin 1832).
It seems very improbable that Guérin's specimens actually belong to this species, which
is known only from the Indo-West Pacific region. Without examination of the original
material, little can be said about its identity.

Family ALBUNEIDAE

Albunea carabus (Linnaeus 1758) (See p. 77).

Suborder BRACHYURA

Family DROMIIDAE

Dromia personata (Linnaeus 1758) (See p. 78)

Family HOMOLIDAE

Homola barbata (Fabricius 1793) (See p. 78)

Paromola cuvieri (Risso 1816)

Methana peninsula, Gulf of Aigina, S Greece (Guérin 1832).

Family DORIPPIDAE

Dorippe lanata (Linnaeus 1767) (See p. 78)

Ethusa mascarone (Herbst 1785) (See p. 79)

Family CALAPPIDAE

Calappa granulata (Linnaeus 1767) (See p. 79)

Family LEUCOSIIDAE

Ebalia nux A. Milne Edwards 1881

W of the Peloponnesos, Greece, 37° 14'N 21° 2'E; NW of Crete, 35° 59'N 22° 56'E,
36° 7'N 23° 8'E, 35° 48'N 23° 34'E, E of the Peloponnesos, 36° 40'N 23° 52'E, 36° 58'N

← neta
Embleton
1834

24° 18'E, 36° 59'N 24° 29'E; N of Crete, 36° 9'N 25° 50'E, 36° 23'N 24° 11'E, 36° 25'N 24° 24'E; N Aegean, 40° 8'N 24° 42'E; Sporades, 36° 47'N 26° 29'E, 36° 37'N 26° 43'E; N of Cyprus, 35° 57'N 32° 51'E; N of Cyrenaica, 33° 56'N 22° 56'E (Adensamer 1898).

Ebalia granulosa H. Milne Edwards 1837 (See p. 79)

Ebalia cranchii Leach 1817 (See p. 80)

Ebalia tuberosa (Pennant 1777)

NW. of Crete, 36° 3'N 23° 6'E (Adensamer 1898).

Merocryptus boletifer A. Milne Edwards and Bouvier 1894

NW of Crete, 36° 3'N 23° 6'E (Adensamer 1898).

Myra fugax (Fabricius 1798) (See p. 81)

Leucosia signata Paulson 1875 (See p. 81)

Philyra globulosa (Bosc 1801)

Phaleron Bay near Athens, Greece (Athanasopoulos 1917). Athanasopoulos recorded this Indo-West Pacific species to be "assez commun" in Phaleron Bay. This record must be considered with a great deal of reserve, since the species has neither before nor afterwards been reported from outside the Indo-West Pacific region.

Illia nucleus (Linnaeus 1758) (See p. 82)

Ixa monodi Holthuis and Gottlieb 1956

Mersin Bay, SE Turkey (Holthuis and Gottlieb 1956).

Family CORYSTIDAE

Corystes cassivelaunus (Pennant 1777)

Scarpanto, Aegean Sea (Santucci 1928).

Family CANCRIDAE

Cancer pagurus Linnaeus 1758

Peloponnesos, Greece (Guérin 1832)

Family PIRIMELIDAE

Pirimela denticulata (Montagu 1808) (See p. 82)

Family PORTUNIDAE

Carcinus mediterraneus Czerniavsky 1884 (See p. 82).

Portumnus latipes (Pennant 177) (See p. 85)

Xaiva biguttata (Risso 1816) (See p. 85)

Macropipus arcuatus (Leach 1814)

Phaleron Bay near Athens, Greece (Athanasopoulos 1917, as *Portunus rondeletii*), S end of Bosphorus, near Princes Islands (=Kizil Adalar), and near Gallipoli, Sea of Marmara (Ostroumoff 1896), Kos (=Coo), Sporades (Santucci 1928), Rhodes (Santucci 1928, Tortonose 1947), Egypt (Audouin 1826, as *Portunus Rondeletii*), near Alexandria, Egypt (Balss 1936), Tolmeta, Cyrenaica (Colosi 1923).

Macropipus puber (Linnaeus 1767)

Phaleron Bay near Athens, Greece (Athanasopoulos 1917).

Macropipus corrugatus (Pennant 1777)

S end of Bosphorus, Sea of Marmara (Ostroumoff 1896), Rhodes (Tortonese 1947), Suez Canal: Great Bitter Lake (Holthuis 1956).

Macropipus parvulus (Parisi 1915) (See p. 86).

Macropipus pusillus (Leach 1815) (See p. 86).

Macropipus vernalis (Risso 1816) (See p. 86).

Macropipus holsatus (Fabricius 1798).

Near Marmara Island, Sea of Marmara (Ostroumoff 1896).

Macropipus marmoreus (Leach 1814)

St. Georges Bay, Beirut, Lebanon (Monod 1931). It is possible that the E Mediterranean specimens referred to in the literature as *Portunus* (= *Macropipus*) *marmoreus* and *P. hol-satus* actually belong to *M. vernalis*.

Macropipus depurator (Linnaeus 1758) (See p. 88)

Macropipus tuberculatus (Roux 1830)

NW of Crete, 35° 59'N 22° 56'E; E of the Peloponnesos, Greece, 36° 40'N 23° 52'E (Steindachner 1891, Adensamer 1898), Cyclades, 36° 59'N 24° 29'E (Adensamer 1898).

Bathynectes longipes (Risso 1816)

Phaleron Bay near Athens, Greece (Athanasopoulos 1917), near Princes Islands (= Kizil Adalar) and near Gallipoli, Sea of Marmara (Ostroumoff 1896).

Bathynectes superba (Costa 1853)

NW of Crete, 35° 45'N 23° 11'E; E of the Peloponnesos, 36° 58'N 24° 18'E (Adensamer 1898).

Charybdis hellerii (A. Milne Edwards 1867) (See p. 88).

Charybdis sexdentata (Herbst 1783) (See p. 89)

Tbalamita admete (Herbst 1803)

Gulf of Aigina near Methana Peninsula, S Greece (Guérin 1832).

Tbalamita poissonii (Audoin 1826) (See p. 89)

Callinectes sapidus Rathbun 1896 (See p. 91)

Portunus hastatus (Linnaeus 1767) (See p. 91)

Portunus pelagicus (Linnaeus 1758) (See p. 92)

Family XANTHIDAE

Xantho poressa (Olivi 1792) (See p. 92)

Xantho granulicarpus Forest 1953 (See p. 93)

Medaeus couchi (Couch 1851)

NW of Crete, 35° 48'N 23° 34'E, 35° 59'N 22° 56'E, and 36° 7'N 23° 8'E; N of Crete, 36° 26'N 25° 24'E; E of the Peloponnesos 36° 40'N 23° 52'E, and 36° 59'N 24° 29'E; Sporades, 36° 47'N 26° 29'E, and 37° 37'N 26° 58'E; N Aegean Sea, 39° 28'N 25° 37'E (Adensamer 1898, as *Xantho tuberculata*), near Kalolimno (=Imrali) Island, near Ereğli, and near Marmara Island, Sea of Marmara (Ostroumoff 1896, as *X. tuberculata*).

Micropanope rufopunctata (A. Milne Edwards 1869) (See p. 94)

Actaea rufopunctata (H. Milne Edwards 1834)

Near Alexandria, Egypt (Balss 1936), Mersin Bay, SE Turkey (Holthuis and Gottlieb 1956).

Pilumnopus vauquelini (Audouin 1826) (See p. 96)

Heteropanope laevis (Dana 1852)

Port Said, Egypt (Calman 1927, Fox 1927), Suez Canal (Calman 1927, Fox 1927, Gruvel 1936, Monod 1937, 1938).

Pilumnus hirtellus (Linnaeus 1761) (See p. 96)

Pilumnus spinifer H. Milne Edwards 1834 (See p. 97)

Pilumnus hirsutus Stimpson 1858

Near Alexandria, Egypt (Balss 1936).

Eriphia verrucosa (Forsk. 1775) (See p. 98).

Family GONEPLACIDAE

Geryon tridens Kröyer 1837

E part of Sea of Marmara (Ostroumoff 1896).

Eucrate crenata (De Haan 1835)

Port Said, Egypt (Calman 1927, Fox 1927), Suez Canal (Calman 1927, Fox 1927, Monod 1937, 1938, Tortonesi 1947b, 1952, Holthuis 1956), near Alexandria (Balss 1936).

Goneplax rhomboides (Linnaeus 1758) (See p. 99)

Family OCYPODIDAE

Ocypode cursor (Linnaeus 1758) (See p. 99).

Family GRAPSIDAE

Pachygrapsus marmoratus (Fabricius 1787) (See p. 100)

Pachygrapsus transversus (Gibbes 1850) (See p. 101)

Planes minutus (Linnaeus 1758) (See p. 102)

Brachynotus sexdentatus (Risso 1827) (See p. 102)

Family PINNOTHERIDAE

Pinnotheres pisum (Linnaeus 1767) (See p. 103)

Pinnotheres pinnotheres (Linnaeus 1758)

Sapientza, S. Greece (Guérin 1832, as *P. veterum*), ? Phaleron Bay near Athens, Greece (Athanasopoulos 1917, see also p. 104), Istanbul and Smyrna (=Izmir), Turkey (Forskal 1775).

Family PALICIDAE

Palicus caronii (P. Roux 1830) (See p. 104)

Family PARTHENOPIDAE

Lambrus angulifrons (Latreille 1825) (See p. 104)

Lambrus macrochelos (Herbst 1790) (See p. 104)

Lambrus massena Roux 1830 (See p. 105)

Lambrus expansus Miers 1879

NW of Crete, 36° 3'N 23° 6'E (Adensamer 1898).

Family MAJIDAE

Maja squinado (Herbst 1788) (See p. 105)

Maja verrucosa H. Milne Edwards 1834 (See p. 105)

Maja goitziana Oliveira 1888 (See p. 106)

Pisa tetraodon (Pennant, 1777) (See p. 108, under *P. muscosa*)

Pisa corallina (Risso, 1816) (See p. 108, under *P. muscosa*)

Pisa muscosa (Linnaeus 1758) (See p. 106)

Pisa nodipes Leach 1815 (See p. 107)

Pisa armata (Latreille 1803)

Phaleron Bay near Athens, Greece (Athanasopoulos 1917, as *P. armata* and *P. Gibbsii*), near Princes Islands (=Kizil Adalar), E Sea of Marmara (Ostroumoff 1896, as *P. Gibbsii*).

Eurynome aspera (Pennant 1777) (See p. 108)

Ergasticus clouei A. Milne Edwards 1881

N of Crete, 36° 26'N 25° 24'E (Steindachner 1891, Adensamer 1898), Sporades, 36° 47'N 26° 29'E; N of Cyprus, 35° 57'N 32° 51'E (Adensamer 1898).

Acanthonyx lunulatus (Risso 1816) (See p. 108)

Dorynchus thomsoni Thomson 1873

S of the Peloponnesos, Greece, 36° 27'N 22° 18'E; Cyclades, 36° 40'N 23° 52'E, 36° 25'N 24° 2'E, 36° 54'N 24° 7'E, 36° 23'N 24° 11'E, 36° 58'N 24° 18'E, 36° 25'N 24° 2'E, 37° 37'N 24° 33'E; N of Cyrenaica, 33° 56'N 22° 56'E (Adensamer 1898, as *Lispognathus thomsoni*).

Inachus dorsettensis (Pennant 1777) (See p. 108)

Inachus phalangium (Fabricius, 1775)

Near Alexandria, Egypt (Balss 1936, as *I. dorynchus*)

Inachus leptochirus Leach 1817

NW of Crete, 36° 3'N 23° 6'E (Adensamer 1898), S end of Bosphorus, near Marmara Island, and near Gallipoli, Sea of Marmara (Ostroumoff 1896).

Inachus thoracicus Roux 1830

Sapientza, S Greece (Guérin 1832), Phaleron Bay near Athens (Athanasopoulos 1917), E coast of Pasha-Liman (=Aloni) Island, Sea of Marmara (Ostroumoff 1896).

Achaeus cranchii Leach 1817

Bay of Aromata, S Greece, 36° 23'N 22° 29'E (Adensamer 1898), Phaleron Bay near Athens, Greece (Athanasopoulos 1917), near Alexandria, Egypt (Balss 1936).

Macropodia rostrata (Linnaeus 1761) (See p. 109)

Macropodia longirostris (Fabricius 1775) (See p. 109)

Macropodia longipes (A Milne Edwards and Bouvier 1894) (See p. 110)

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