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## Contribution to the Knowledge of the Amphipoda 93. New records of some Gammaroidea Amphipoda from the Mediterranean Sea.

### ABSTRACT

New records regarding the variability and distribution of 28 species of Amphipoda (Gammaroidea) belonging to 12 genera from the Mediterranean Sea are presented. *Cheirocratus robustus* Sars 1895 is removed to *Cheirocratus sundevallii* (Rathke 1843) as synonym. Two forms of *Elasmopus rapax* Costa 1853 and *Elasmopus pocillimanus* (Bate 1862) are found. The species *Elasmopus rapax serricatus* J. Barnard 1969a and *Megaluropus agilis massiliensis* Led. 1975 are removed to the specific rank. The species *Elasmopus rapax mutatus* J. Bar. 1962, *Elas. rapax var. dentipalma* Wal. 1916 and *Elas. rapax barbatus* Schell. 1925 are discussed. *Gammarellus carinatus* (Rathke 1837) is probably identic with *G. angulosus* (Rathke 1843). *Gammarus subtypicus* Stock 1966 is very similar with *G. crinicornis* Stock 1966 and the taxonomical status of both species must be reexamined on larger number of samples.

### INTRODUCTION

During our study of the Amphipoda from the Mediterranean Sea, many new records regarding the distribution and the taxonomic status of some Amphipoda from this region were established. We decided to publish some of these records, hoping that it should be usefull for the next study of the mediterranean fauna of Amphipoda and its distribution in this region.

The material mentioned in this work was provided from several sources: Museo Civico di Storia Naturale, Verona (Italy), Institute of Taxonomic Zoology, University of Amsterdam (Holland), Museum d'Histoire Naturelle, Paris (France) and Karaman's Collection in Titograd.

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**Abbreviations:**

KC = Karaman's collection in Titograd.

VC = collection of Museo Civico di Storia Naturale, Verona.

AC = collection of Institute of Taxonomic Zoology, Amsterdam.

PC = collection of Museum d'Histoire Naturelle, Paris.

#### *Ceradocus orchestipes* Costa

**Syn.:** *Ceradocus orchestipes* Costa 1853: 177.

*Maera orchestipes* Heller 1867: 38, pl. 3, fig. 22, 23.

*Megamoera orchestipes* Grube 1864: 73.

**Material examined:** Bay of Piran (Istra, Adriatic Sea), August 17, 1972, one spec. (leg. D. Vrščaj).

#### *Cheirocratus sundevallii* (Rathke), new synonymy

**Syn.:** *Gammarus sundevallii* Rathke 1843: 65, pl. 3, fig. 2.

*Cheirocratus Sundevalli*, Sars 1895: 524, pl. 184, 185, fig. 1.

*Cheirocratus sundevalli* G. Karaman 1973: 115; 1977: 50.

*Cheirocratus robustus* Sars 1895: 526, pl. 185, fig. 2;

Stebbing 1906: 419; Stephensen 1927: 111; Stephensen

1928: 295, fig. 65, 1-2; Stephensen 1929: 144, fig. 35;

Oldevig 1933: 186; Stephensen 1940: 305; Oldevig 1959: 89.

*Cheirocratus sundevallii* G. Karaman 1977: 50, fig. IV.

**Material examined:** France: Roscoff, one spec. (Cognetti leg.), VC.

Italy: Golfo di Napoli (Vervece) May 4, 1970, 2 spec. accompanied by *Cheir. monodontus* (leg. U. Schiecke); Secca lo Bianco (Napoli), depth 140 m, August 1, 1970, 2 spec. (leg. U. Schiecke); south of Formide, Oct. 21, 1969, depth 12 m (leg. U. Schiecke); several localities in Golfo di Napoli; (all VC).

Malta Island: coast of Malta, 1 spec. VC.

Yugoslavia: Rovinj, 2 samples, VC.

**Remarks.** Sars described (1895) a new species *Cheirocratus robustus* n. sp. from the coasts of Norway (Trondhjemsfjord, Christianiafjord), mentioning that *C. robustus* differs from *C. sundevallii* by stout enlarged articles 3-6 of pereopod 7 in males (slender, normal, in *sundevallii*), by article 6 of gnathopod 2 in males armed »with only a single irregular tubercle« (palm of gnathopod 2 in males of *C. sundevallii* is »armed with 3 denticles one of which is placed at some distance from the other 2, at the end of the palm«), by telson having on each lobe about 5 distal spines (3 distal spines in *C. sundevallii*).

The specimens in our hand show very large variability of each of these 3 characters differing *C. sundevallii* from *C. robustus*:

Within the specimens from Napoli, the specimens with large articles 3-6 of pereopod 7 in males were observed (»robustus-type«), the specimens with normal, narrow articles 3-6 of pereopod 7 in males (»sundevallii-type«), as well as the specimens with pereopod 7 transitive between both types (sometimes in the same population). Probably, the senior specimens have dilated, »robustus-type« of pereopod 7 very often. The similar modifications of pereopod 7 in males towards »robustus-type« we observed now also in some adult specimens of *C. assimilis*.

The shape and armature of palm of gnathopod 2 in males is also very variable: within the populations from Napoli, the specimens with palm provided with 1 corner and 3 median palmar spines were observed, the specimens with 1 corner and 1-2 median palmar spines, the specimens with 2 corner and 2 median spines, the specimens with 2 corner and 3 median palmar spines as well as the specimens without corner, but with 2-3 median palmar spines were observed.

The number of distal spines on telson is also very variable: in the populations from Napoli the specimens with 3 distal spine on each telson-lobe and with large (»robustus-type«) pereopod 7 were observed, the specimens with 5-6 distal spines on each telson-lobe and narrow (»sundevallii-type«) pereopod 7 as well as the specimens with 3 distal spines on each telson-lobe and with narrow pereopod 7 in males.

Evidently, all characters used to separate *C. robustus* and *C. sundevallii* are not valid and the full transition between both species was observed, indicating *C. robustus* as only one extreme form of *C. sundevallii*. For this reason, we submerged *C. robustus* into *C. sundevallii* as synonym.

*Echinogammarus festai* (Ruffo)

- Syn.: *Gammarus Festae* Ruffo 1937: 438, fig. 1.  
*Neogammarus festae* G. Karaman 1973: 112, fig. 5-8.  
*Echinogammarus festai* G. Karaman 1977a: 114, fig. II, 2.

Material examined: Napoli (Maronti), several spec. VC.

*Echinogammarus rhipidiophorus* (Catta)

- Syn.: *Gammarus rhipidiophorus* Catta 1878: 256.  
*Neogammarus rhipidiophorus* (part.) S. Karaman 1950: 176, fig. 1-15.  
*Echinogammarus rhipidiophorus* G. Karaman et Ruffo 1977: 164, fig. I, 1-6.

Material examined: coast of Malta, Mediterranean Sea, VC.

*Elasmopus affinis* Della Valle

- Syn.: *Elasmopus affinis* Della Valle 1893: 734, pl. 1, fig. 9, pl. 22, fig. 1-15.

Material examined: Mar Grande, Taranto (Italy), May, 1966, KC.

*Elasmopus brasiliensis* (Dana)

- Syn.: *Gammarus brasiliensis* Dana 1853: 956, pl. 65, fig. 10a-e.  
*Elasmopus brasiliensis* Chevreux 1911: 222, fig. 12, pl. 15, fig. 14-20.

Material examined: several samples from the coast of Malta island (Mediterranean Sea), sometimes accompanied by *Elasmopus pocillimanus*, VC; Bay of Piran, Adriatic Sea (August 17, 1972, one spec. (leg. D. Vrščaj) KC.

*Elasmopus pocillimanus* (Bate)

- Syn.: *Moera pocillimanus* Bate 1862: 191, pl. 34, fig. 7.  
*Elasmopus pocillimanus* Chevreux 1911: 225, pl. 16, fig. 1-2.

Material examined: several samples from the coast of Malta island, sometimes accompanied by *Gammarella fucicola*, *Elas. brasiliensis* or *Elasm. rapax*, VC; Napoli, one spec. accompanied by *El. rapax*, VC; Taranto, depth 15 m, 2 spec. (leg. Parenzan, P.), KC; Adriatic Sea: Bay of Piran, Febr. 9, 1973, one spec. (leg. D. Vrščaj),

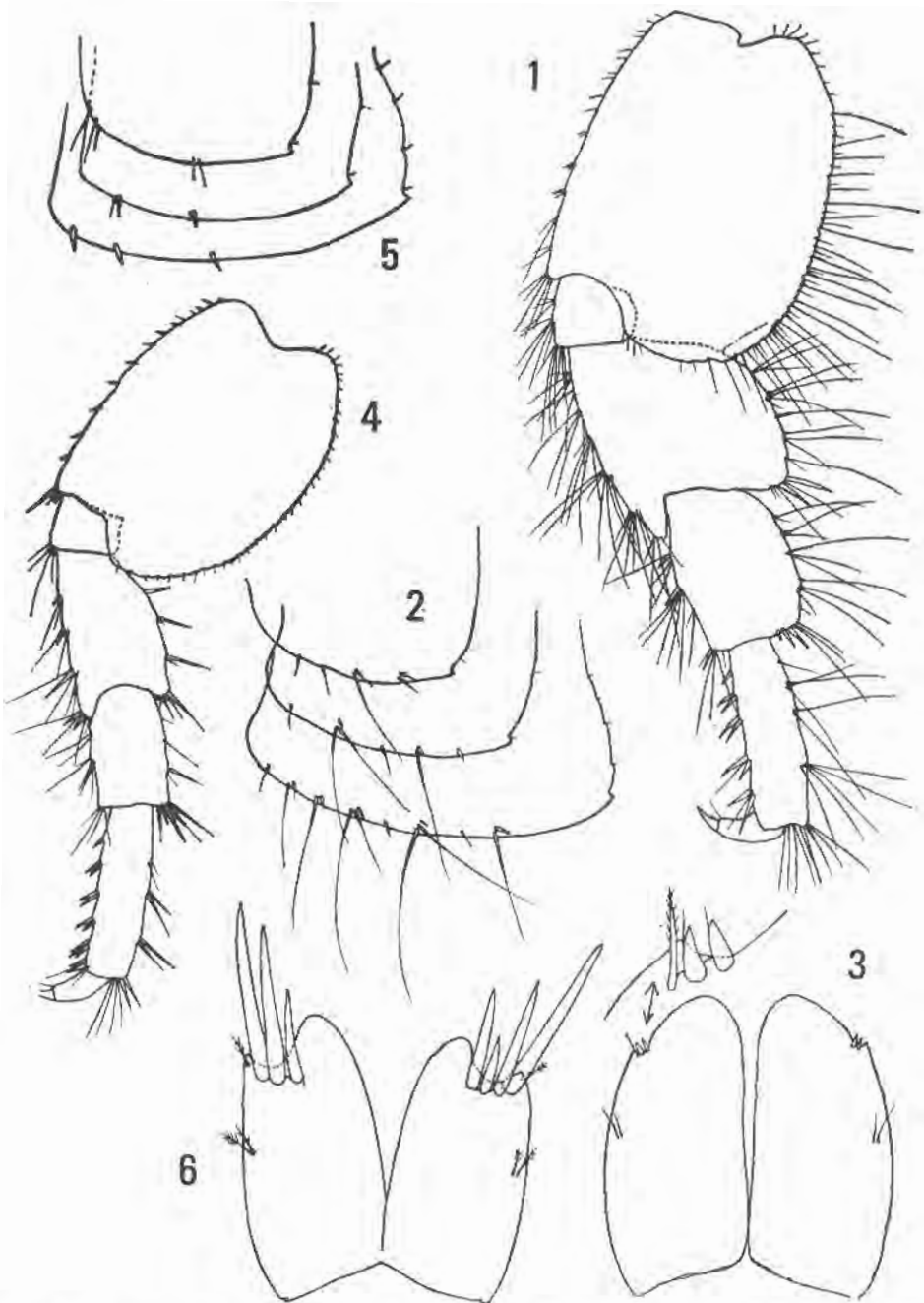


Fig. 1. *Elasmopus rapax* Costa, Split, male 9 mm: 1 = pereopod 7; 2 = epimeral plates; 3 = telson.  
 Female 7 mm: 4 = pereopod 7; 5 = epimeral plates; 6 = telson.

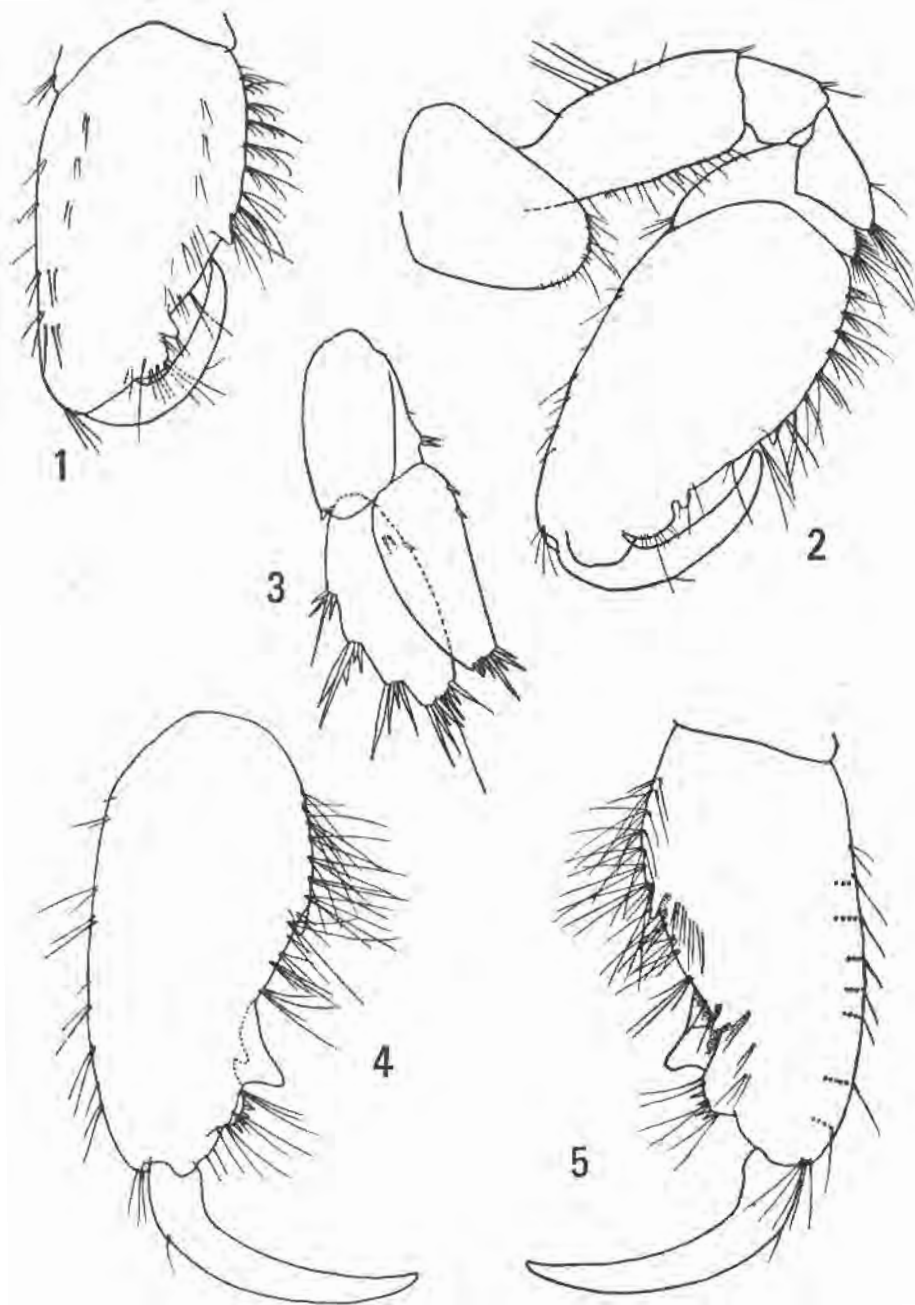


Fig. 11. *Elasmopus rapax* Costa, Split male 9 mm: 1 = gnathopod 2, inner face; 2 = gnathopod 2, outer face; 3 = uropod 3. Male 8 mm, Napoli: 4 = gnathopod 2, outer face; 5 = gnathopod 2, inner face.

KC; between Split and Šolta Island, depth 50 m, May 13, 1960, 2 spec. (leg. G. Kar.), KC; Lokrum Island near Dubrovnik, June 1972, depth 6 m, 2 spec. (leg. G. Kar.), KC.

Very often, within the same population of *E. pocillimanus*, two different forms were observed (like these in *E. rapax*):

forma A: epimeral plates provided with long ventromarginal setae, basis (article 2) of pereopods 5-7 provided with numerous long setae at posterior margin, and telson with short distal spines;

forma B: epimeral plates provided with very short ventromarginal setae, article 2 of pereopods 5-7 provided with very short setae, and telson with long distal spines.

The transitive specimens between both forms were observed, sometimes within the same population, what indicated that these forms can be not a distinct species, but probably ecological forms.

The females of *Elasmopus pocillimanus* are very similar to those of *E. rapax*, and on the present level of our knowledge of the variability of both species, it is not possible to separate the females of *E. rapax* from the females of *E. pocillimanus*, although the existing of very fine minor morphological differences between both species can be expected.

*Elasmopus rapax* Costa  
(fig. I-II)

Syn.: *Elasmopus rapax* Costa 1853: 175; Costa 1857: 212, pl. 4, fig. 5.

*Elasmopus latipes* Boeck 1871: 212.

Material examined: Italy. Golfo di Napoli, several localities, several spec. accompanied sometimes by *E. pocillimanus*, VC;

Malta: several samples from the coast of Malta, several spec. accompanied by *E. pocillimanus*, VC;

Adriatic Sea: Yugoslavia: Bay of Piran, August 17, 1972 (leg. Vrščaj, D.), 2 spec., KC; Split, 1972, 2 spec. accomp. by *E. rapax*, KC.

Remarks. *E. rapax* is very variable species. In the Mediterranean Sea, we observed two different forms, often in the same population:

— forma A (forma typica?): epimeral plates 1-3 provided with long ventromarginal setae, basis (article 2) of pereopods 5-7 with numerous long setae at posterior margin, articles 3-6 of pereopods 5-7 more setiferous, telson on each lobe with 2 distal short spines;

— forma B: epimeral plates 1-3 provided with very short ventrodorsal setae, article 2 of pereopods 5-7 with very short setae at



posterior margin, articles 3-6 of pereopods 5-7 less setiferous, telson on each lobe with 2-4 long distal spines.

The transitive specimens between both forms were observed, sometimes in the same population what indicated that these forms are not a distinct species but only ecological forms. The females of form A and form B have similar, long distal spines on telson.

The similar presence of two different forms of *E. rapax* was observed by some other authors also, on the material from America. J. Barnard (1962) described the new subspecies *Elasmopus rapax mutatus* n. ssp. from Flat Rock Pt., Palos Verdes Headland (southern California), and this subspecies differs from typical *E. rapax rapax* from California by the lack of long setae on basis of pereopods 5-7, by uniaarticulated accessory flagellum (2-3 articulated in *E. rapax rapax*), by absence of long setae on ventral margin of epimeral plates, slightly less setose propodus of gnathopod 2, etc. Evidently, *E. rapax mutatus* likes very much to *E. rapax* forma B from the Mediterranean Sea.

J. L. Barnard described (1969a) a new subspecies, *Elasmopus rapax serricatus* n. ssp. from La Jola, California (Pacific Ocean), differing from *E. rapax rapax* by strongly crenuloserrate ventroposterior margin of basis of pereopods 5-7, by truncate distal part of telson-lobes provided with 5-8 spines. The serrate posterior margin of pereopods 5, 6 or 7 is stable character in many *Elasmopus* species used to separate many similar species to each other (*E. pecteniscrus*) and here this character can be used as specific character of *serricatus*. For this reason we removed subspecies *E. rapax serricatus* to the specific rank, *Elasmopus serricatus* J. Barnard 1969a.

Schellenberg (1925) described *Elasmopus rapax* forma *barbata* n. f. from Kamerun, Victoria (Atlantic coast of Africa) removing it later (1939) to the subspecific rank, based on new studied material from Banana and Malembe (mouth of Kongo River). This subspecies seems to be very similar to *Elasmopus rapax rapax* except the presence of curled setae at posterior margin of propodus of gnathopod 2 in males. The taxonomic position of this subspecies must be reexamined based on a full redescription of this taxon.

Walker described (1916) *Elasmopus rapax* var. *dentipalma* n. var. from Arica (Chile, S. America); this taxon differs from *E. rapax rapax* by the shape of palm of gnathopod 2 in males «defined by one strong tooth; on the inner side near the hinge of the dactylus is a broad irregular rounded tooth, below which is another similar to that defining the palm but larger. On the other side, opposite to the rounded tooth and projecting beyond it, is a long curved tooth with rounded apex».

The similar shape of palm of gnathopod 2 in males was observed in some specimens of *E. rapax rapax* from Napoli (fig. I). As



the other characters of *dentipalma* are poorly described, it was not possible to synonymize it with *E. rapax rapax*, although recently, no other differences between *rapax* and *dentipalma* are known. If other differences between these two taxons will be not found, *dentipalma* must be submerged into *E. rapax* as synonym.

#### *Eriopisa elongata* (Bruzelius)

Syn.: *Eriopisa elongata* Bruzelius 1859: 65, pl. 3, fig. 12.  
*Eriopisa elongata* Sars 1895: 515, pl. 181, fig. 2; G. Karaman 1973: 115.

Material examined: Italy. Ischia Island (Napoli), depth 100-110 m, (leg. U. Schiecke), VC. Adriatic Sea: Yugoslavia: off Ulcinj, June 22, 1968, 1974, one spec., depth 60 m (leg. G. Kar.) KC; off Budva, Febr. 26, 1970, one spec., KC.

#### *Gammarella fucicola* (Leach)

Syn.: *Pherusa fucicola* Leach 1814: 432.  
*Gammarella brevicaudata*, Heller 1867: 35.  
*Gammarus obtusunguis* Costa 1857: 219, pl. 3, fig. 8.  
*Gammarella fucicola* J. Barnard 1969: 241.

Material examined: France: Bouzigues (mouth of Rhone River), Dec. 6, 1966, depth 9 m, several spec. (leg. G. Kar.), KC;

Italy: Napoli, bay near the cave of Ameno, Sept., 1968, one spec. accompanied by *Melita hergensis* (leg. U. Schiecke), VC;

Malta: several localities along the coast, sometimes accompanied by *Elasmopus pocillimanus* or *Melita hergensis* (leg. U. Schiecke), VC;

Adriatic Sea, Yugoslavia: Bay of Piran, Oct. 10, 1971, one spec. KC; Split, coast, Sept. 1950, depth 1.5 m (leg. S. Karaman), KC; Lokrum Island near Dubrovnik, June 1972, depth 6 m (leg. G. Kar.), KC; Budva, depth 6 m, August 16, 1974 (leg. G. Kar.), KC; Bar, Sept. 1970, depth 2 m (leg. G. Kar.), KC; Ulcinj, Sept. 1970, depth 1.5 m (leg. G. Kar.), KC.

#### *Gammarellus angulosus* (Rathke)

Syn.: *Gammarus angulosus* Rathke 1843: 72, pl. 3, fig. 3.  
*Gammarellus angulosus* Chevreux et Fage 1925: 204, fig. 211, 212; Vader 1975: 111, fig. 2.

Material examined: Bosphorus, several spec., VC.

#### *Gammarellus carinatus* (Rathke)

Syn.: *Amathia carinata* Rathke 1837: 375, pl. 5, fig. 29-35.  
*Amathilla carinatus* Czerniavsky 1868: 131.

*Gammarellus carinatus* Miloslavskaja 1930: 41, fig. 1-13; Miloslavskaja 1931: 67, fig. 28, 34; Gurjanova 1951: 739, fig. 511; Morduchai-Boltovskoj 1969: 457, pl. 5, fig. 2; Greze 1977: 12.

Remarks: Rathke described (1837) *Amathia carinata* n. g. n. sp. from Balaklava Bay in Black Sea, Krim. Later, many authors mentioned this species from other localities in the Black Sea.

Rathke described (1843) *Gammarus angulosus* n. sp. from Christiansund (Norway) mentioning that three species, *carinatus*, *angulosus* and *sabini* (= *homari* Febr. 1779) belong to a new distinct genus *Amathia*. Unfortunately, *Amathia* was nom. preocc. by Decapoda, and Bate and Westwood (1863) established a new name for *Amathia*, *Amathilla* n. g. But, this genus was already synonym of genus *Gammarellus* Herbst 1793 (*Cancer* (*Gammarellus*)). A type species was selected by Chevreux et Fage 1925 (*homari*) although indicated already by Sars 1899.

*Gammarellus homari* is known from Atlantic and *G. angulosus* was found in Atlantic as well as in the Mediterranean Sea. Third species, *G. carinatus*, was known only from the Black Sea.

But, *G. carinatus* was never described in details, and based on recently known characters of this species, it likes to be identic with *G. angulosus*. The single character, mentioned by some authors (Miloslavskaja 1930, 1931, Gurjanova 1951), which can differs *carinatus* from *G. angulosus*, is very large, ovoid article 2 of pereopod 7 which is not tapering distally (article 2 of pereopod 7 in *G. angulosus* is tapering distally). But the figures of *carinatus* from Black Sea, presented by some other authors recently (Morduchai-Boltovskoj 1969) showed the article 2 of pereopod 7 like that in *G. angulosus*, tapering distally.

To resolve this problem it will be necessary to compare the specimens from Black Sea with these from the Mediterranean Sea. Probably, the both species are identic to each other, in this case *G. angulosus* should be a synonym of *G. carinatus* (Rathke 1837).

#### *Gammarus aequicauda* (Martynov)

Syn.: *Carinogammarus aequicauda* Martynov 1931: 593, fig. 28-39.

*Gammarus tunetanus* Simon 1885: 6.

*Gammarus eduardi* Vecchi 1931: 59, fig. 1-4.

*Gammarus aequicauda* Stock 1970: 49.

*Gammarus plumicornis* Costa 1857: 215, pl. 4, fig. 1a-c.

Material examined: France: canal de Rove (W of Marseille), Jan. 4, 1967, many spec. accompanied by *G. insensibilis* (leg. G. Kar.), KC; torrent Tourloubre (Etang de Bere), Jan. 4, 1967, se-

veral spec. accomp. by *G. insensibilis* (leg. G. Kar.), KC; Etang de Bolman (W of Marseille), Jan. 4, 1967, several spec. (leg. G. Kar.), KC; Salses (Pyr. Orientales), Sept. 18, 1961; *ibid*, April 30, 1967 (leg. G. Osella), VC; Etang de Lavalduc (B. du Rhone), April 15, 1964, (leg. Berner), VC;

Italy: Lago Varano, April 23, 1940, VC; Lago Lungo (Napoli), between *Enteromorpha*, April 2, 1974 (leg. U. Schiecke) VC; Chiodoro River (Taranto, Puglia), VC; Lago Piccolo (Sicilia) (leg. S. Riggio), VC; S. Antioro (Sardegna), May 2, 1955 (leg. Cottarelli), VC;

Malta Island: several samples along the coast of Malta, VC;

Greece: Zante, March 26, 1936, several specimens accompanied by *Orchestia mediterranea* (leg. J. Versluys), KC; Creta Island: S. Nicolaos, June 29, 1964 (leg. Valle), VC; Georgiopulos, July 18, 1974, (leg. Argano), VC;

Yugoslavia: Rovinj, Sept. 12, 1959, VC; Trieste, KC; Trogir, 1924, coast (leg. S. Karaman), KC; Mouth of Cetina River near Omiš, 1924, (leg. S. Karaman), KC; Dubrovnik, Ombla River (= Rijeka Dubrovačka), 1950 (leg. S. Karaman), KC; Ulcinj (Porta Milena), Oct. 8, 1971, many spec. (leg. G. Kar.), KC;

Turkey: Bosphorus, depth 5 m, VC; Smyrna, May 1907, KC; Smyrna, August 1900 (leg. Steindacher), KC;

Lybia: Bu Dreiza (Bengazi), Jan. 5, 1968 (leg. Valle), VC.

Remarks: *Gammarus plumicornis* Costa 1853 is synonym of *G. aequicauda* (Martynov 1931) by request for preservation of name *G. aequicauda* by Stock (1970) in Bull. zool. Nomencl. 27 (1): 49-50, 1970.

### *Gammarus crinicornis* Stock

Syn.: *Gammarus crinicornis* Stock 1966: 2; Stock 1967: 32, fig. 12-16.

Material examined: France: Valras-Plage (Herault), under stones, April 27, 1968 (leg. J. Stock), AC; La Tamarisiere, April 27, 1968 (leg. J. Stock), AC; Merveille, mouth (dept. B. du Rhone), Oct. 20, 1968 (leg. L. Berner), AC; Gapeau (dept. Var), brackish water, May 16, 1968 (leg. L. Bernar), AC;

Spain: Jugar Calleza (prov. Valencia), Aug. 9, 1970 (leg. Pinkster et Stock), AC;

Italy: Venezia, Punta Sabbioni, July 1968 (leg. H. G. et A. Denert), AC; Sea coast N of Torregaveta (W of Lago Fussaro, Napoli), May 11, 1950 (leg. L. Holthuis), AC; Spiaggia Porto Corsini (Romagna), (leg. Zangeri, data?), VC; Napoli, Ischia Island, depth 8 m, Febr. 25, 1969 (leg. U. Schiecke), VC;

Morocco: Plage de Salé, VC.

### Gammarus insensibilis Stock

Syn.: *Gammarus insensibilis* Stock 1966: 2; Stock 1967: 15, fig. 2, 3, 4a, 5, 6; Morduchai-Boltovskoi 1969: 455, pl. 4, fig. 2.

Material examined: France: Bouzigues, Dec. 12, 1966 (leg. G. Kar.), KC; canal de Rove (W of Marseille), Jan. 4, 1967, accompanied by *G. aequicauda* (leg. G. Kar.), KC; torrent Tourloubre (Etang de Bere), Jan. 4, 1967, accompanied by *G. aequicauda*, (leg. G. Kar.), KC; Estaque (Marseille), Jan. 13, 1964 (Berner leg.), VC; Marseille, Oct. 6, 1966, depth 6 m, in *Posidonia* (leg. G. Kar.), KC; Sigean (Pyr. Orient.), Sept. 22, 1961 (leg. Sacchi), VC;

Italy: Laguna di Orbetello (Toscana), April 15, 1975 (leg. Cognetti), VC; Lido di Venezia, Sept. 1936 (leg. Zorzi), VC; Lago di Nazioni (Comacchia), June 23, 1974 (leg. De Angelis), VC; Lago Fusaro (Napoli), Jan. 25, 1942, VC; Taranto, La Strea, depth 2 m, May, 1966 (leg. Parenzan), KC; Cagliari (Sardegna), several spec. VC;

Yugoslavia: Rovinj (no data), VC; Split, mouth of Jadro River, April 1948 (leg. S. Karaman), KC; Verige in Boka Kotorska, depth 2 m, July 1972, KC; Budva depth 6 m, Aug. 16, 1974, KC;

Greece: Dragonera (no data), KC.

### Gammarus subtypicus Stock

Syn.: *Gammarus subtypicus* Stock 1966: 3; Stock 1967: 37, fig. 17-21; Morduchai-Boltovskoi 1969: 454, pl. 4, fig. 3.

Material examined: France Le Jai (W of Etang de Berre), Feb. 20, 1962 (leg. Ledoyer), AC; Banyuls sur Mer (Pyr. Orient.), depth 4 m, between *Posidonia*, July 4, 1956 (leg./det. Stock), AC; Port-la — Nouvelle, April 18, 1967, between *Enteromorpha*, AC;

Italy: Napoli, Ischia Island, depth 8 m, Febr. 25, 1969 (leg. U. Schiecke), VC;

Greece: Lagune cca 10 km far from Kavala, June 20, 1973 (leg. S. Pinkster and A. Goedmakers), AC; Island Lesvos (5 km from Mandamos, no data) (leg. A. C. and W. N. Ellis), AC;

Turkey: coast of Mediterranean Sea near Kizkalesi, May 12, 1959 (leg. C. Swennen), AC;

Remarks: *Gammarus subtypicus* is very similar to *G. crinicornis* Stock 1966, and differs from later only by several small characters:

— Peduncle of antenna 2 with articles 4-5 provided with ventral setae much longer than dorsal one (dorsal and ventral setae on antenna 2 in males of *crinicornis* are of the same length);

— eyes are more than two times longer than broad (less than two times as long as broad in *crinicornis*);

— basis (article 2) pereopod 7 with more crenulated posterior margin, bearing higher number of posterior setae (basis is less crenulated, bearing lower number of posterior setae in *crinicornis*);

— urosome distinctly elevated and laterally compressed (urosome only slightly elevated and not compressed laterally in *crinicornis*).

Because of large variability of each of mentioned characters within the populations of *subtypicus* and *crinicornis*, sometimes was very difficult to decide if one population belongs to *crinicornis* or *subtypicus*. It is necessary to reexamine the taxonomical status of both species based on much richer material because of the eventual possibility that *crinicornis* and *subtypicus* belong to the same species.

#### *Maera grossimana* (Montagu)

Syn.: *Cancer Gammarus grossimanus* Montagu 1808: 97, pl. 4, fig. 5.

*Maera grossimana* Karaman et Ruffo 1971: 114, fig. 1-3.

Material examined: Italy: Golfo di Napoli (scoglio di Vervece), (leg. U. Schiecke), VC; Laguna di Venezia, VC; Cagliari (Sardegna), VC;

Yugoslavia: Bay of Piran, August 17, 1972 (leg. D. Vrščaj), KC; Rovinj, depth 6 m, July 1965 (leg. G. Kar.), KC; Lokrum Island near Dubrovnik, depth 10 m, June 1972 (leg. G. Kar.), KC; off Bar, Aug. 15, 1974, depth 50 m (leg. G. Kar.), KC.

Remarks: Cecchini (1928) and Cecchini and Parenzan (1935) mentioned *Maera hirondellei* Chevr. 1900 for some localities in Italy (Golfo di Napoli, Venezia), but because of very scarce description of these specimens it is possible that these specimens belong to *M. grossimana*. Recently very often these two species were misdetermined because of small but distinct differences between them. G. Karaman and Ruffo (1971) showed that *M. hirondellei* differs from *M. grossimana* distinctly by the presence of distinct distoposterior lobe on article 2 of pereopods 5-7 (that lobe is absent always in *M. grossimana*).

#### *Maera inaequipes* (Costa)

Syn.: *Amphithoe inaequipes* A. Costa 1851: 45; Costa 1857: 205, pl. 2, fig. 10.

*Maera integrimana* Heller 1867: 40, pl. 3, fig. 25.

*Gammarus scissimanus* Costa 1853: 176.

*Maera inaequipes* Karaman et Ruffo 1971: 143, fig. 17-20.

Material examined: France: Banyuls-sur Mer, VC; Malta Island, VC;

Italy: Sorrento, VC; Castromarina, VC; Lipari (Castello), VC; Golfo di Napoli: Scoglio di Vervece, VC; Procida, VC.

Yugoslavia: Bay of Piran, Febr. 10, 1973 (leg. D. Vrččaj), KC; Rovinj, VC; Petrovac na Moru, July, 1973 (leg. G. Kar.), depth 3 m, KC.

#### *Maera schmidtii* Stephensen

Syn.: *Maera schmidtii* Stephensen 1915: 48, fig. 32; Karaman and Ruffo 1971: 158, fig. 24-27.

*Maera micronyx* Ruffo 1946: 54.

Material examined: Yugoslavia: Bay of Piran, Oct. 25, 1972 (leg. D. Vrččaj), KC; Ulcinj; on muddy bottom, June 22, 1968 (leg. G. Kar.), KC.

#### *Maera sodalis* G. Karaman et Ruffo

Syn.: *Maera sodalis* G. Karaman et Ruffo 1971: 127, fig. 8-10.

Material examined: Yugoslavia: Limski Kanal (channel) (leg. D. Zavodnik), KC.

#### *Megaluropus massiliensis* Ledoyer, new comb.

Syn.: *Megaluropus agilis massiliensis* Ledoyer 1975: 1307, fig. 2 and 4, I.

Material examined: France, Marseille, depth 8 m, sandy bottom with *Posidonia*, Oct. 6, 1966 (leg. G. Kar.), KC;

Italy: Golfo di Napoli (Pietra Salata), sandy bottom, depth 10-12 m, March 1974, accompanied by *M. monasteriensis* (leg. U. Schiecke), VC;

Tunis: Gulf of Tunis near Sidi Bou Said harbour, depth 1-2.5 m, on fine sandy bottom with detritus and *Cymodocea*, Oct. 2, 1974 (leg. U. Schiecke), VC; Gulf of Tunis, 0.5 km out of Cap Gamart, 0.5-1 m depth, between detritus, algae and *Cymodocea*, Sept. 22, 1974, accompanied by *M. monasteriensis* (leg. U. Schiecke).

Remarks: Ledoyer described this species from Marseille (1975) as the subspecies of *M. agilis*, although he mentioned several valid characters differing it from *agilis*:

— Lateral cephalic lobes are subrounded in males and females of *massiliensis* (distinctly acute in females and males of *agilis*);

— posterior margin of epimeral plate 3 is distinctly serrate in females of *massiliensis* (undistinctly serrate in *agilis*);

— rostrum is slightly longer in *massiliensis* (shorter in *agilis*);

— urosomite 1 with distinctly crenulated dorsoposterior margin in *massiliensis* (almost smooth in *agilis*).

As no transitive specimens between *agilis* and *massiliensis* are known, we removed taxon *massiliensis* to the specific rank.

#### *Megaluropus monasteriensis* Ledoyer

Syn. *Megaluropus monasteriensis* Ledoyer 1975: 1309, fig. 3, 4, II.

*Megaluropus agilis* Della Valle 1893: 697, pl. 3, fig. 9, pl. 34, fig. 1-17 K.

?*Megaluropus agilis* Ruffo 1946: 55.

Material examined: Italy: Golfo di Napoli (Pietra Salata), depth 10-12 m, sandy bottom, March 1974, accompanied by *M. massiliensis* (leg. U. Schiecke), VC;

Malta: coast of Malta (leg. U. Schiecke), VC;

Tunis: Gulf of Tunis, 0.5 km from Cap Gamart, depth 0.5-1 m, between detritus, algae and Cymodocea, accompanied by *M. massiliensis* (leg. U. Schiecke), Sept. 22, 1974.

#### *Melita coroninii* Heller

Syn.: *Melita Coroninii* Heller 1867: 37, pl. 3, fig. 20, 21; Chevreux et Fage 1925: 229, fig. 238, 240.

Material examined: Italy: Lavinio (Thyrrhean Sea), accompanied by *M. hergensis*, VC.

#### *Melita gladiosa* Bate

Syn.: *Melita gladiosa* Bate 1862: 185, pl. 33, fig. 6; Chevreux et Fage 1925: 233, fig. 244; Cecchini et Parenzan 1935: 194, fig. 30.

Material examined: France: Banyuls sur Mer, 1957 (leg./det. W. Vader).

Italy: Golfo di Napoli, several samples, sometimes accompanied by *Melita hergensis* (leg. U. Schiecke), VC;

Yugoslavia: Bay of Piran, Oct. 25, 1972, KC; off Budva, depth 60 m, sandy + muddy bottom, 1974 (leg. G. Kar.), KC; off Bar, Aug. 15, 1974, depth 50 m, muddy bottom (leg. G. Kar.), KC; bay of Čanj near Bar, depth 25 m, muddy bottom (leg. G. Kar.), KC; mouth of



Bojana River, Oct. 29, 1969 (leg. G. Kar.), muddy bottom, KC; Ulcinj, June 22, 1968 (leg. G. Kar.), KC.

#### Melita hergensis Reid

Syn.: *Melita hergensis* Reid 1939: 278, fig. A-K; Giordani-Soika 1949: 181; Macquart-Moulin 1968: 323.

Material examined: Italy: several localities in Golfo di Napoli (Spiaggia degli Inglesi, Bagno di Rep. Giov.), sometimes accompanied by *Melita bulla*, *Melita valesi*, *Melita palmata* or *Melita gladiosa* (leg. U. Schiecke), VC; Ameno (Napoli), Sept. 1968, accomp. by *Gammarella fucicola* (leg. U. Schiecke), VC; Lavinio, accompanied by *M. coroninii*, VC; Stretto di Messina (leg. Krapp), VC;

Malta: several samples from the coast of Malta (leg. U. Schiecke), sometimes accomp. by *Gammarella fucicola*, VC;

Yugoslavia: Split, Jan. 1930 (leg. S. Karaman), accomp. by *M. palmata*, KC; Njivice near Herceg-Novci, April 29, 1966, (leg. G. Kar.), KC; Budva, Aug. 16, 1974, in Posidonia, depth 6 m, KC; Donja Lastva near Tivat, Dec. 16, 1971, accomp. by *M. palmata* (leg. G. Kar.), KC; Kamenovo near Budva, coast, accomp. by *M. bulla*, Aug. 10, 1974 (leg. G. Karaman), KC; Ulcinj, depth 4 m, Aug. 14, 1974 (leg. G. Kar.), KC.

Remarks: Very variable species. The shape of epimeral plates 1-3: with very poorly to sharply pointed distoposterior corner; gnathopod 2 in males poorly to densely setose; pereopods 5-7 poorly to densely setose, especially article 6, uropod 3 with long or short setae. All these variability was observed sometimes within the same population so it was not possible to separate setose specimens from poorly setose specimens as distinct taxa.

The body-pilosity was not in connection with the body-size of specimens. The adult specimens, including ovigerous females, from 4-10 mm length were observed.

#### Melita obtusata (Montagu)

Syn.: *Cancer Gammarus obtusatus* Montagu 1813: 5, pl. 2, fig. 7.

*Gammarus obtusunguis* Costa 1853: 176.

*Melita obtusata* Della Valle 1893: 711, pl. 1, fig. 7, pl. 23, fig. 1-19; Chevreux et Fage 1925: 232, fig. 243.

Material examined: Atlantic: Am 697-Grandcamp (Calvados), many spec. (leg. Chevreux 1907), PC; Am 698-Le Croisic, dept. 10 m, 3 spec. (Chevreux det.), PC; Am 704-«Le Travailleur», dragage 26, July 24, 1882, Cap Sines, depth 370 m, PC.

**Remarks:** The number of dorsoposterior teeth on metasom-segments 1-3 and on urosomites 1-2 within the specimens in our hand from Atlantic, showed very large variability. Among 20 studied specimens (7 males, 13 females), all specimens were without any dorsal tooth on metasomsegment 1;

— metasomsegment 2: one female was without any dorsal tooth, 8 specimens were with 3 dorsal teeth and 11 specimens were with one dorsal tooth;

— metasomsegment 3: 12 specimens were without any dorsal tooth, 2 specimens were with one dorsal tooth and 6 specimens were with 3 dorsal teeth;

— urosomite 1: all 20 specimens were with 3 dorsal teeth;

— urosomite 2: all 20 specimens were with 2+2 dorsal teeth.

#### *Melita palmata* (Montagu)

**Syn.:** *Cancer Palmatus* Montagu 1804: 69, pl. 6, fig. 4.

*Melita palmata* Heller 1867: 36; Sars 1895: 508, pl. 179;

Karaman G. 1972: 99.

**Material examined:** France: Bouzigues, salt lake (Mar-seille), depth 9 m, Dec. 6, 1966, 5 spec. (leg. G. Kar.), KC;

Italy: several localities in Golfo di Napoli, sometimes accompa-nied by *Melita hergensis* (leg. U. Schiecke), VC;

Yugoslavia: Split, coast, Jan. 1930, 10 spec. accompanied by *Melita hergensis* (leg. S. Karaman), KC; Ombla River (=Rijeka Du-brovačka) near Dubrovnik, 1950, 2 spec. (leg. S. Karaman), KC; Nji-vice near Herceg-Novı, April 29, 1966 (leg. G. Kar.), KC; Donja La-stva near Tivat, Dec. 16, 1971, one spec. accompanied by *M. her-gensis* (leg. G. Kar.), KC; Prčanj (Boka Kotorska), Aug. 25, 1972, accompanied by *Echinogammarus pungens* (leg. G. Kar.), KC.

#### *Pereionotus testudo* (Montagu)

**Syn.:** *Oniscus testudo* Montagu 1808: 102.

*Iceridium fuscum* Grube 1864a: 75; Grube 1864b: 58.

*Pereionotus testudo* Chevreux et Fage 1925: 142, fig. 142, 143.

**Material examined:** Yugoslavia: Bay of Piran, Febr. 10, 1973 (leg. D. Vrščaj), KC; Petrovac na Moru, Aug. 10, 1974, be-tween algae, depth 1 m (leg. G. Kar.), KC; Donja Lastva in Boka Kotorska, depth 2 m, between algae (leg. G. Kar.), KC.

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93. PRILOG POZNAVANJU AMPHIPODA. NOVI PODACI  
O NEKIM AMFIPODIMA PODREDA GAMMARIDEA  
IZ SREDOZEMNOG MORA

Rezime

U radu je obrađeno 28 vrsta Amphipoda podreda *Gammaridea* sa područja Crnogorskog primorja, cijelog Jadrana kao i nekih dijelova Sredozemnog mora: *Ceradocus orchestypes* Costa 1853, *Cheirocratus sundevallii* (Rathke), *Echinogammarus festai* (Ruffo 1937), *Echinogammarus rhipidiophorus* (Catta 1878), *Elasmopus affinis* Della Valle 1893, *Elasmopus brasiliensis* (Dana 1853), *Elasmopus pocillimanus* (Bate 1862), *Elasmopus rapax* Costa 1853, *Eriopisa elon-*

*gata* (Bruzelius 1859), *Gammarella fucicola* (Leach 1814), *Gammarellus angulosus* (Rathke 1843), *Gammarellus carinatus* (Rathke 1837), *Gammarus eaquicauda* (Martynov 1931), *Gammarus crinicornis* Stock 1966, *Gammarus insensibilis* Stock 1966, *Gammarus subtypicus* Stock 1966, *Maera grossimana* (Montagu 1808), *Maera inaequipis* (Costa 1851), *Maera schmidtii* Stephensen 1915, *Maera sodalis* G. Karaman et Ruffo 1971, *Megaluropus massiliensis* Ledoyer 1975, *Megaluropus monasteriensis* Ledoyer 1975, *Melita coroninii* Heller 1867, *Melita gladiosa* Bate 1862, *Melita hergensis* Reid 1939, *Melita obtusata* (Montagu 1813), *Melita palmata* (Montagu 1804) i *Pereionotus testudo* (Montagu 1808).

*Cheirocratus robustus* Sars 1895 je ukinuta kao posebna vrsta i pripojena je vrsti *Cheirocratus sundevallii* (Rathke 1843) kao sinonim.

Dvije podvrste, *Elasmopus rapax serricatus* J. Barnard 1969a i *Megaluropus agilis massiliensis* Ledoyer 1975 su postavljene kao zasebne vrste.

Detaljno je razmatran taksonomski položaj vrsta *Elasmopus rapax mutatus* J. Barnard 1962, *Elasmopus rapax* var. *dentipalma* Walker 1916. i *Elasmopus rapax barbatus* Schell. 1925.

Na osnovu analize pojedinih odlika, dokazano je da postoji vjerovatnoća da je vrsta *Gammarellus angulosus* (Rathke 1843) identična sa vrstom *Gammarellus carinatus* (Rathke 1837). Slična sumnja postoji i za vrstu *Gammarus subtypicus* Stock 1966 koja je vrlo slična vrsti *Gammarus crinicornis* Stock 1966.