ISRAEL JOURNAL OF ZOOLOGY, Vol. 43, 1997, pp. 19–54

PROSOBRANCH MOLLUSC FAUNA OF THE AEGEAN SEA: NEW INFORMATION, CHECKLIST, DISTRIBUTION

DROSOS KOUTSOUBAS,[a] ATHANASIOS KOUKOURAS,[b] AND ELENI VOULTSIADOU-KOUKOURA[b]
[a]*Institute of Marine Biology of Crete, P.O. Box 2214, Iraklion GR 71003, Crete, Greece*
[b]*Department of Zoology, Aristotle University, Thessaloniki 54006 , Greece*

ABSTRACT

The gastropod mollusc fauna of the North Aegean Sea was investigated during the last 20 years. Examination of the material collected from that area revealed the presence of 279 prosobranch mollusc species. One hundred of them are new records for the mollusc fauna of the North Aegean Sea, 9 for the Aegean Sea and 10 for the Eastern Mediterranean. An updated checklist of the Aegean prosobranch molluscs including 420 species is presented for the first time. All the six prosobranch orders living in the Mediterranean were found to be represented in the Aegean. A zoogeographical analysis of the Aegean prosobranch mollusc fauna showed that the bulk of the species are Atlanto-Mediterranean, followed by Mediterranean endemics and Boreal. Only 5 of the Mediterranean species of Indo-Pacific origin have been found in the Aegean, mostly in the southern part. A comparison of the Aegean prosobranch fauna with those of the other Mediterranean areas, showed that the number of species in the Aegean is higher than in any other Mediterranean area except the western basin.

INTRODUCTION

The Aegean Sea with a surface of approximately 2×10^5 km^2 and a volume of 7.4×10^4 km^2 (Hopkins, 1978) is located in the eastern part of the Mediterranean. The Aegean Sea is shallow (mean depth 477 m) with an annual range of surface salinity of 32.0–39.0 ppt and temperatures of 10.5–25.5 °C (Lacombe et al., 1958; Kiortsis, 1969), and is more complex than other regions of the eastern Mediterranean with respect to geography and bottom topography (Theocharis et al., 1993). Its distinguishing features are the very irregular coastline and the presence of more than 2,000 islands scattered over the area. Thus, the Aegean Sea constitutes a separate subsystem in relation to the Mediterranean (Murdoch and Onuf, 1974) and its fauna is of special interest (Pérès, 1967).

However, despite the interest in its fauna, the Aegean remains one of the most poorly studied areas of the Mediterranean as far as the molluscs are concerned. The oldest records of marine molluscs in Greece are those by Deshayes after the "Expédition

Accepted March 1996.

Scientifique de Morée" in 1835. A few years later, Forbes (1844) and Jeffreys (1883a,b), reported on marine molluscs of the Aegean.

During the 20th century, a series of studies including scattered information on the mollusc fauna of the Aegean and especially of the prosobranch molluscs appeared but they give a rather confused picture since many of the species recorded are synonyms, invalid species or species of uncertain presence in this area of the Mediterranean. The most important of these studies are those of Sakellariou, 1957; Oberling, 1960–62; Fielding and Edmunds, 1973; Nordsieck, 1973 a,b, 1976 a,b, 1977 a,b, 1982; Verduin, 1976a, 1979, 1982 a,b, 1983, 1984, 1985, 1986a, 1988; Koroneos, 1979; Aartsen, 1982 a,b, 1988a, 1993; Nofroni, 1982 a,b; Bouchet and Waren, 1986; Oliverio, 1986; Aartsen and Zenetos, 1987; Barash and Danin, 1988/1989; Tenekidis, 1989; Zenetos et al., 1991; Koutsoubas et al., 1992; Zenetos and Aartsen, 1994. It must be noticed that the majority of the material included in these studies comes from the southern part of the Aegean.

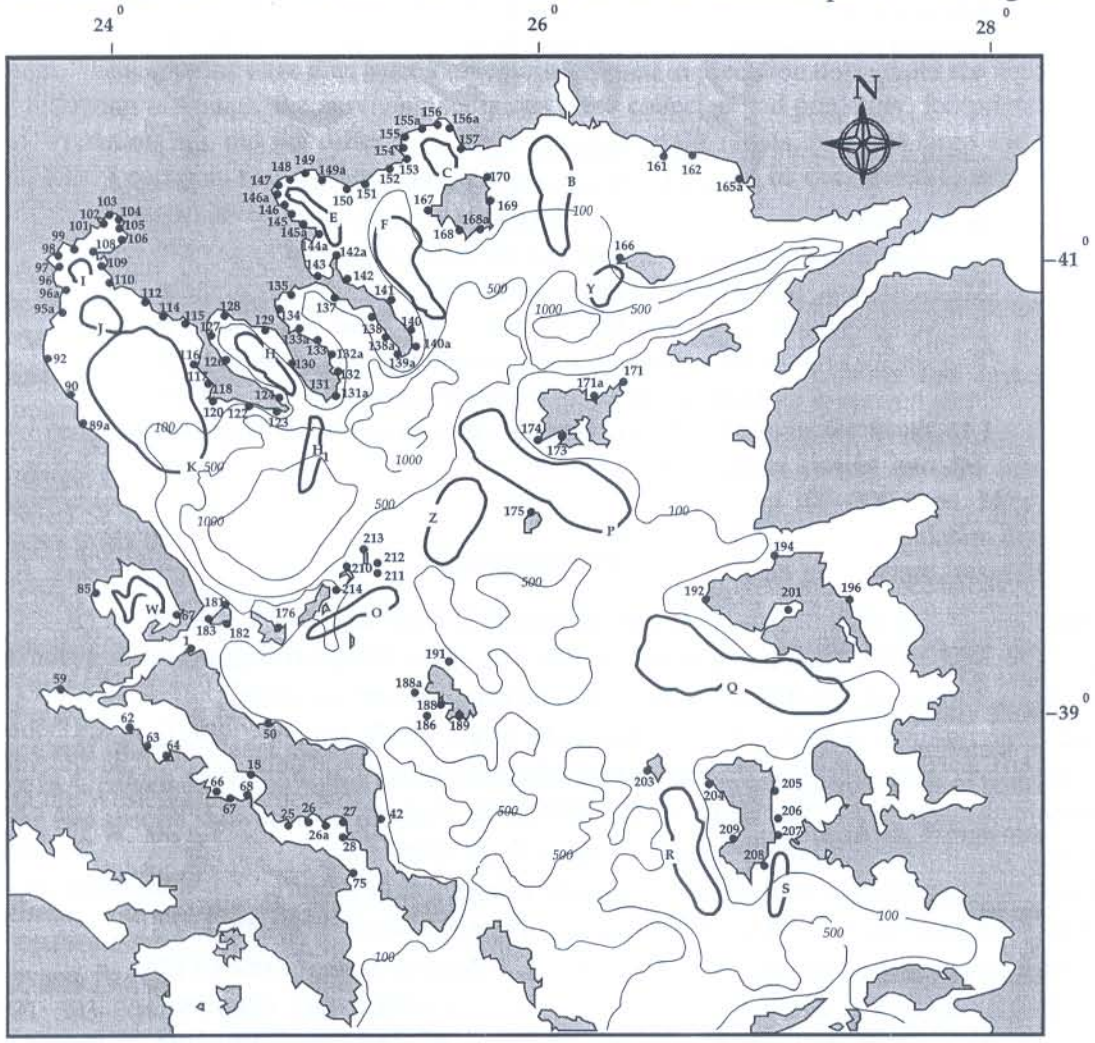

Fig. 1. Map of the North Aegean Sea indicating the sampling stations. (●: stations where the samples were collected by scuba diving or grabs; bold line with capital letters: areas where the samples were collected by dredges or fishing nets)

The main objectives of this study are: (1) to provide information on the prosobranch mollusc fauna of the North Aegean Sea, (2) to present for the first time an updated checklist of the Aegean prosobranchs, and (3) to discuss their composition and zoogeographical status.

MATERIALS AND METHODS

Since 1970, samplings have been carried out throughout the Greek coastal area of the North Aegean Sea (Fig. 1). Specimens were collected by scuba diving and by dredges, grabs, or fishing nets, at depths of up to 1000 m. They were preserved in 5% formalin and are deposited in the Museum of the Department of Zoology, University of Thessaloniki (MZUT). The classification used is that of Sabelli et al. (1990).

In order to present the geographical distribution in the Mediterranean, its main areas were delineated as shown in Fig. 2. This delineation was based on the geographical status of this area (Pérès and Picard, 1964; Por and Dimentman, 1989).

RESULTS AND DISCUSSION

MATERIAL EXAMINED

The examination of the collected material (25,982 live individuals and shells) from the North Aegean Sea revealed the presence of 279 prosobranch species (Table 1). Among these, species new for the mollusc fauna of the Eastern Mediterranean Sea, the Aegean Sea or the North Aegean Sea are presented below. The sampling stations where these species were found, are given in Fig. 1.

A. New records for the eastern Mediterranean fauna

Family: SKENEIDAE

Parviturbo fenestratus (Chaster, 1896)

Parviturbo fenestratum, Waren, 1992, p. 154, figs. 1B, 3B.

Material. st. H1, 1 specimen (shell), 150 m, sandy-muddy bottom.

Distribution. Mediterranean: only from Bocche di Bonifacio (Bogi and Nofroni, 1986 as *Cyclostrema sphaeroidea*) and coast of North Africa from Morocco to Libya (Waren, 1992). Eastern Atlantic: Ibero-Moroccan Gulf (Waren, 1992)

Family: RISSOIDAE

Rissoa aartseni Verduin, 1985

Rissoa monterosatoi, Pallary, 1906, p. 98, pl. IV figs. 12, 13.

Rissoa aartseni, Verduin, 1985, p.106, figs. 31–33.

Material. stations 108, 110, and 146a, 12 specimens (shells), 3–14m, *Posidonia.*

Distribution. Mediterranean: only from Sfax (Pallary, 1906; Verduin, 1985) and Lampedusa Is. (Spada et al., 1973).

Table 1

Prosobranch mollusc species known from the Aegean Sea (examined material and literature). * = Museum of the Department of Zoology, University of Thessaloniki; o = first record for the area marked; L1–L79 = authors from the literature; L? = record in the Aegean without specification of the areas sampled. NA = North Aegean Sea; SA = South Aegean Sea; SM = Sea of Marmara; BS = Black Sea; LB = Levantine Basin; CM = Central Mediterranean; AD = Adriatic Sea; WM = Western Mediterranean; ZC = Zoogeographic Characterization (E: Mediterranean Endemics; AM: Atlanto-Mediterranean; B: Boreal; C: Cosmopolitan; SE: Senegalian; IP: Indo Pacific)

	NA	SA	SM	BS	LB	CM	AD	WM	ZC
DOCOGLOSSA									
Patellidae									
* *Patella caerulea* Linnaeus, 1758	L41	L1	+		+	+	+	+	AM
Patella ferruginea Gmelin, 1791		L1			+			+	E
* *Patella rustica* Linnaeus, 1758	L55	L1			+	+	+	+	AM
* *Patella ulyssiponensis* Gmelin, 1791	L41	L1	+	+	+	+	+	+	AM
Acmaeidae									
* *Acmaea virginea* (Mueller O.F., 1776)	L8	L2	+		+	+	+	+	B
Lepetidae									
Propilidium pertenue Jeffreys, 1883		L3						+	AM
COCCULINIFORMIA									
Lepetellidae									
Lepetella laterocompressa (De Rayneval & Ponzi,1854)		L78			+			+	AM
NERITOMORPHA									
Neritidae									
Nerita sanguinolenta Menke, 1829		L30							IP
* *Smaragdia viridis* (Linnaeus, 1758)	L59	L2			+	+	+	+	AM
VETIGASTROPODA									
Fissurellidae									
* *Fissurella nubecula* (Linnaeus, 1758)	L64	L19			+	+		+	AM
* *Diodora gibberula* (Lamarck, 1822)	L55	L13	+		+	+	+	+	AM
* *Diodora graeca* (Linnaeus, 1758)	L16	L1	+	+	+	+	+	+	AM
* *Diodora italica* (Defrance, 1820)	L16	L1	+		+	+	+	+	E
Diodora producta (Monterosato, 1880)		L49			+	+		+	E
* *Emarginula adriatica* Costa O.G., 1829	o	L77				+	+	+	AM
* *Emarginula octaviana* Coen, 1939	L56	L2			+	+	+	+	AM
Emarginula rosea Bell T., 1824		L2	+			+	+	+	AM
* *Emarginula sicula* Gray, 1825	o	L2	+		+	+	+	+	AM
* *Emarginula solidula* Costa O.G., 1829	o				+		+	+	AM
* *Emarginella huzardii* (Payraudeau, 1826)	L55	L1		+	+	+	+	+	AM
* *Puncturella noachina* (Linnaeus, 1758)	L56					+	+	+	C
Scissurellidae									
Scissurella costata D' Orbigny, 1824		L2	+	+	+	+	+	+	AM
* *Anatoma crispata* Flemming, 1828	L8	L3			+	+		+	C
Sinezona cingulata (Costa O.G., 1861)		L73			+			+	E

Table 1 *continued*

	NA	SA	SM	BS	LB	CM	AD	WM	ZC
Haliotidae									
* *Haliotis tuberculata lamellosa* Lamarck, 1822	L55	L1			+	+	+	+	E
Trochidae									
* *Clanculus corallinus* (Gmelin, 1791)	L12	L1			+	+	+	+	E
* *Clanculus cruciatus* (Linnaeus, 1758)	L41	L1	+		+	+	+	+	AM
* *Clanculus jussieui* (Payraudeau, 1826)	L41	L1			+	+	+	+	E
* *Calliostoma conulus* (Linnaeus, 1758)	L64	L77			+	+	+	+	AM
* *Calliostoma granulatum* (Von Bon, 1778)	L66	L1	+	+	+	+	+	+	AM
Calliostoma gualterianum (Philippi, 1848)		L19			+	+		+	E
* *Calliostoma laugieri laugieri* (Payraudeau, 1826)	L41	L1	+		+	+	+	+	AM
* *Calliostoma zizyphinum* (Linnaeus, 1758)	L56	L1	+		+	+	+	+	AM
* *Gibbula adansonii adansonii* (Payraudeau, 1826)	L55	L1	+		+	+	+	+	E
* *Gibbula adriatica* (Philippi, 1844)	L66	L1	+			+	+		E
* *Gibbula albida* (Gmelin, 1791)	L1	L2	+	+	+		+		E
* *Gibbula ardens* (Von Salis, 1793)	L16	L1	+		+	+	+	+	E
* *Gibbula divaricata* (Linnaeus, 1758)	L64	L1	+	+	+	+	+	+	AM
Gibbula drepanensis (Brugnone, 1873)		L49				+	+	+	E
* *Gibbula fanulum* (Gmelin, 1791)	L41	L1			+	+	+	+	AM
* *Gibbula guttadauri* (Philippi, 1836)	o	L3	+		+	+	+	+	E
* *Gibbula leucophaea* (Philippi, 1836)	L59	L73	+	+	+	+	+	+	E
* *Gibbula magus* (Linnaeus, 1758)	L16	L2	+		+	+	+	+	AM
* *Gibbula philberti* (Rècluz, 1843)	L41	L49	+		+	+	+	+	AM
Gibbula racketti (Payraudeau, 1826)	L55	L2	+		+	+		+	E
* *Gibbula rarilineata* (Michaud, 1829)	L55	L28			+	+	+	+	E
* *Gibbula richardi* (Payraudeau, 1826)	L55	L1	+		+	+	+	+	E
Gibbula spratti (Forbes, 1844)	L2	L2							E
* *Gibbula turbinoides* (Deshayes, 1835)	L55	L2			+	+	+	+	E
* *Gibbula varia* (Linnaeus, 1758)	L12	L2	+	+	+	+	+	+	AM
Gibbula vimontiae Monterosato, 1884		L42						+	AM
* *Gibbula umbilicaris* (Linnaeus, 1758)	L12	L1	+		+	+	+	+	E
* *Danilia otaviana* (Cantraine, 1835)	o	L2			+	+	+	+	AM
* *Putzeysia wiseri* (Calcara, 1842)	o				+	+		+	AM
* *Monodonta articulata* Lamarck, 1822	L49	L1	+		+	+	+	+	AM
* *Monodonta mutabilis* (Philippi, 1846)	L55	L7	+		+	+	+	+	E
* *Monodonta turbinata* (Von Born, 1778)	L26	L1	+		+	+	+	+	AM
* *Jujubinus exasperatus* (Pennant, 1777)	o	L2			+	+	+	+	AM
* *Jujubinus gravinae* (Dautzenberg, 1881)	o	L29				+	+	+	AM
Jujubinus karpathoensis Nordsieck, 1973		L29							E
* *Jujubinus montagui* (Wood W., 1828)	o	L3	+		+	+		+	AM
* *Jujubinus striatus striatus* (Linnaeus, 1758)	L12	L1	+		+	+	+	+	AM
* *Clelandella miliaris* (Brocchi, 1814)	o	L2			+	+	+	+	E
Collonidae									
* *Homalopoma sanguineum* (Linnaeus, 1758)	L20	L1			+	+	+	+	AM
Skeneidae									
Skenea catenoides (Monterosato, 1877)		L79						+	AM

Table 1 *continued*

	NA	SA	SM	BS	LB	CM	AD	WM	ZC
* *Parviturbo fenestratus* (Chaster, 1896)	o							+	AM
Dikoleps nitens (Philippi, 1844)		L4			+	+		+	AM
Tharsiella depressa (Granata-Grillo, 1877)		L78				+	+	+	E
Tricoliidae									
* *Tricolia pullus pullus* (Linnaeus, 1758)	L12	L1	+	+	+	+	+	+	E
* *Tricolia speciosa* (Von Muehlfeldt, 1824)	L41	L1	+		+	+	+	+	E
* *Tricolia tenuis* (Michaud, 1829)	o	L2	+		+	+	+	+	AM
Turbinidae									
* *Bolma rugosa* (Linnaeus, 1767)	L12	L2	+		+	+	+	+	AM
NEOTAENIOGLOSSA									
Cerithiidae									
Cerithium alucaster (Brocchi, 1814)		L73			+		+	+	E
Cerithium lividulum Risso, 1826		L49			+			+	E
Cerithium protractum Bivona Ant.in Bivona And.,1838	L73?	L73?						+	E
* *Cerithium rupestre* Risso, 1826	L26	L2	+		+	+	+	+	AM
* *Cerithium vulgatum* (Bruguière, 1792)	L7	L2	+	+	+	+	+	+	AM
* *Bittium jadertinum* (Brusina, 1865)	L50	L50			+		+	+	AM
Bittium lacteum lacteum (Philippi, 1836)		L2			+	+	+	+	AM
* *Bittium latreillii* (Payraudeau, 1826)	L12	L35	+		+		+	+	AM
* *Bittium reticulatum* (Da Costa, 1778)	L2	L2	+	+	+	+	+	+	B
* *Bittium scabrum* (Olivi, 1792)	o	L9	+		+	+	+	+	E
Cerithidium submamillatum (DeRayneval &Ponzi,1854)		L7	+	+	+	+	+	+	E
Fossaridae									
* *Fossarus ambiguus* (Linnaeus, 1758)	o	L15			+	+	+	+	AM
Potamididae									
* *Pirenella conica* (Blainville, 1826)	L41	L49			+	+	+	+	E
Siliquariidae									
* *Tenagodus obtusus* (Shumacher, 1817)	o	L2			+	+	+	+	E
Turritellidae									
* *Turritella communis* Risso, 1826	L2	L17	+	+	+	+	+	+	AM
* *Turritella turbona* Monterosato, 1877	L17	L2			+	+	+	+	AM
Littorinidae									
* *Littorina neritoides* (Linnaeus, 1758)	L26	L1	+	+	+	+	+	+	AM
Littorina punctata (Gmelin, 1791)		L69			+			+	AM
Skeneopsidae									
Skeneopsis pellucida (Monterosato, 1874)		L73						+	E
Cingulopsidae									
* *Eatonina fulgida* (Adams J., 1797)	o	L54				+	+	+	B
Eatonina ochroleuca (Brusina, 1869)		L54				+	+	+	E
* *Eatonina pumila* (Monterosato, 1884)	o	L70				+		+	E
Rissoidae									
* *Rissoa aartseni* Verduin , 1985	o					+			E
* *Rissoa auriformis pseudomonodonta* Verduin, 1983	o	L52							E

Table 1 *continued*

	NA	SA	SM	BS	LB	CM	AD	WM	ZC
* *Rissoa auriscalpium* (Linnaeus, 1758)	L59	L18			+	+	+	+	E
Rissoa decorata Philippi, 1846		L49					+	+	E
Rissoa frauenfeldiana Brusina, 1868		L49				+	+		E
* *Rissoa labiosa* (Montagu, 1803)	L51	L1	+	+	+	+	+	+	AM
* *Rissoa lia* (Monterosato, 1884 ex Benoit ms)	L66	L51			+	+		+	AM
* *Rissoa monodonta* Philippi, 1836	L2	L18	+		+	+	+	+	E
* *Rissoa rhodhensis* Verduin, 1985	o	L57			+	+			E
* *Rissoa scurra* (Monterosato, 1917)	o	L27				+	+	+	E
* *Rissoa similis* Scacchi, 1836	o	L2	+		+	+	+	+	AM
* *Rissoa splendida* Eichwald, 1830	L55	L18	+	+		+	+		E
* *Rissoa variabilis* (Von Muehlfeldt, 1824)	L12	L1			+	+	+	+	E
Rissoa ventricosa Desmarest, 1814		L1				+	+	+	E
* *Rissoa violacea violacea* Desmarest, 1814	o	L2			+	+	+	+	E
Alvania aartseni Verduin, 1986		L71						+	E
Alvania amatii Oliverio, 1986		L61			+				E
* *Alvania aspera* (Philippi, 1844)	o	L45			+	+	+		E
* *Alvania beani* (Hanley in Thorpe, 1844)	L55	L2	+		+	+	+	+	B
Alvania beniamina (Monterosato, 1884)		L54				+		+	E
* *Alvania cancellata* (Da Costa, 1778)	L56	L1			+	+	+	+	AM
* *Alvania carinata* (Da Costa, 1778)	o	L46				+	+	+	AM
* *Alvania cimex* (Linnaeus, 1758)	o	L75				+	+	+	E
* *Alvania cimicoides* (Forbes, 1844)	L2	L2				+	+	+	AM
Alvania collosophilus Oberling, 1970	L73	L27			+				E
* *Alvania discors* (Allan, 1818)	o	L1	+		+	+	+	+	AM
Alvania dorbignyi (Audouin, 1827)		L73			+				IP
* *Alvania geryonia* (Nardo,1847 ex Chiereghini ms)	o	L73?			+	+	+	+	E
Alvania hispidula (Monterosato, 1884)	L73?	L73?			+	+	+	+	AM
* *Alvania lactea* (Michaud, 1832)	o	L18	+	+	+	+	+	+	AM
* *Alvania lanciae* (Calcara, 1841)	o				+	+		+	AM
* *Alvania lineata* Risso, 1826	o	L1			+	+	+	+	E
Alvania litoralis (Nordsieck F., 1972)		L68				+		+	E
* *Alvania mammilata* Risso, 1826	o	L62			+	+	+	+	E
Alvania oranica (Pallary, 1900)		L78				+			E
* *Alvania paupercula* (Jeffreys, 1867)	o	L77				+	+	+	AM
* *Alvania punctura* (Montagu, 1803)	o	L3				+	+	+	B
Alvania rudis (Philippi, 1844)		L18	+				+	+	E
* *Alvania scabra* (Philippi, 1844)	o	L7			+	+	+	+	AM
Alvania schwartziana Brusina, 1866		L49					+		E
* *Alvania semistriata* (Montagu, 1808)	L54	L18			+	+	+	+	B
Alvania subcrenulata (B.D.D., 1884)		L25			+	+	+	+	E
Alvania subsoluta (Aradas, 1847)		L27				+		+	AM
* *Alvania testae* (Aradas & Maggiore, 1844)	o	L3			+	+		+	AM
* *Benthonella tenella* (Jeffreys, 1869)	o				+	+		+	AM
* *Manzonia crassa* (Kanmacher, 1798)	o	L18	+		+	+	+	+	B
* *Manzonia zetlandica* (Montagu, 1815)	L73	L3				+		+	B
Obtusella intersecta (Wood S.W., 1857)		L3					+	+	AM

Table 1 *continued*

	NA	SA	SM	BS	LB	CM	AD	WM	ZC
Obtusella macilenta (Monterosato, 1880)		L3				+		+	AM
Onoba candida (Brown, 1827)		L2						+	B
Peringiella elegans (Locard, 1892)		L73				+	+	+	AM
Peringiella epidaurica (Brusina, 1866)		L70			+	+	+	+	AM
* *Pusillina diversa* (Nordsieck F., 1972)	L36	L2		+	+	+	+	+	E
Pusillina incospicua (Alder, 1844)		L3			+	+	+	+	B
Pusillina lineolata (Michaud, 1832)		L36	+	+	+	+	+	+	E
* *Pusillina marginata* (Michaud, 1832)	L36	L21		+	+	+	+	+	E
* *Pusillina munda* (Monterosato, 1884)	o	L36			+	+		+	E
* *Pusillina parva* (Da Costa, 1778)	L66	L77		+	+	+	+	+	B
* *Pusillina philippi* (Aradas & Maggiore, 1844)	o	L2	+	+	+	+	+	+	E
* *Pusillina radiata* (Philippi, 1836)	L36	L18	+	+	+	+	+	+	E
* *Setia amabilis* (Locard, 1886)	o	L18			+		+	+	E
Setia ambigua (Brugnone, 1873)		L49				+	+	+	AM
Setia maculata (Monterosato, 1869)	L54	L54				+	+	+	E
* *Setia turriculata* Monterosato, 1884	L54	L73			+		+	+	E
* *Rissoina bruguieri* (Payraudeau, 1826)	o	L9	+	+	+	+	+	+	AM
Adeorbidae									
Circulus cfr. *tricarinatus* (Wood, 1848)	L73?	L73?						+	AM
Anabathridae									
* *Nodulus contortus* (Jeffreys, 1883)	o	L44				+	+	+	AM
Pisinna glabrata (Von Muehlfeldt, 1824)		L73			+	+	+	+	AM
Assimineidae									
Paludinella littorina (Delle Chiaje, 1828)		L71			+	+	+	+	AM
Barleeidae									
* *Barleeia unifasciata* (Montagu, 1803)	L26	L18			+	+	+	+	B
Caecidae									
Caecum auriculatum De Folin, 1868		L7	+		+	+	+	+	E
Caecum clarkii Carpenter, 1858		L73			+	+	+	+	E
Caecum subannulatum De Folin , 1870	L73?	L73?	+			+		+	E
* *Caecum trachea* (Montagu, 1803)	o	L43	+	+	+	+	+	+	AM
* *Parastrophia asturiana* De Folin, 1870	L73	L73			+	+	+	+	AM
Hydrobiidae									
* *Hydrobia acuta* (Draparnaud, 1805)	o	L73?		+	+			+	AM
Hydrobia ulvae (Pennant, 1777)	L73?	L73?			+	+	+	+	B
* *Ventrosia ventrosa* (Montagu, 1803)	o	L28	+	+	+	+	+	+	B
Heleobia stagnorum (Gmelin, 1791)	L32					+	+	+	B
Potamopyrgus jenkisi (Smith, 1889)		L28	+		+			+	B
Iravadiidae									
* *Ceratia proxima* (Forbes & Hanley,1850 ex Alder ms)	o	L75				+		+	AM
* *Hyala vitrea* (Montagu, 1803)	L27	L73		+	+	+	+	+	B
Tornidae									
* *Tornus subcarinatus* (Montagu, 1803)	o	L18	+	+	+	+	+	+	AM

Table 1 *continued*

	NA	SA	SM	BS	LB	CM	AD	WM	ZC
Truncatellidae									
* *Truncatella subcylindrica* (Linnaeus, 1767)	L41	L18	+	+	+	+		+	AM
Strombidae									
Strombus decorus (Roeding, 1798)		L60	+		+				IP
Aporrhaiidae									
* *Aporrhais pespelecani* (Linnaeus, 1758)	L7	L2	+	+	+	+	+	+	B
* *Aporrhais serresianus* (Michaud, 1828)	L73	L3						+	B
Calyptraeidae									
* *Calyptraea chinensis* (Linnaeus, 1758)	L2	L1	+	+	+	+	+	+	AM
Crepidula gibbosa Defrance, 1818	L41	L73			+	+	+	+	E
* *Crepidula unguiformis* Lamarck, 1822	L41	L9			+	+	+	+	E
Capulidae									
* *Capulus hungaricus* (Linnaeus, 1758)	L26	L2	+		+	+	+	+	AM
Vermetidae									
Vermetus cristatus Biondi, 1857		L15			+	+		+	E
* *Vermetus granulatus* (Gravenhorst, 1831)	o	L73?				+	+	+	AM
Vermetus semisurrectus Bivona Ant., 1832	L73?	L73?	+		+		+	+	AM
* *Vermetus triquetrus* Bivona Ant., 1832	L55	L6	+		+	+	+	+	AM
* *Petaloconchus glomeratus* (Linnaeus, 1758)	L55	L11			+	+	+	+	AM
* *Serpulorbis arenaria* (Linnaeus, 1767)	L12	L2	+		+	+	+	+	AM
Cypraeidae									
* *Erosaria spurca* (Linnaeus, 1758)	L73	L2	+		+	+		+	SE
Erronea caurica (Linnaeus, 1758)		L23			+	+			IP
* *Luria lurida* (Linnaeus, 1758)	L16	L2			+	+	+	+	SE
* *Zonaria pyrum* (Gmelin, 1791)	L73	L1			+	+	+	+	E
Ovulidae									
* *Aperiovula adriatica* (Sowerby G.B.I., 1828)	o						+	+	E
* *Neosimnia spelta* (Linaneus, 1758)	o					+	+	+	AM
* *Pseudosimnia carnea* (Poiret, 1789)	L73	L73	+		+		+	+	AM
* *Simnia purpurea* Risso, 1826	o	L73						+	E
Lamellariidae									
* *Lamellaria perspicua* (Linnaeus, 1758)	o	L77			+	+	+	+	C
Trivia arctica (Pulteney, 1789)	L64	L1	+		+	+	+	+	B
* *Trivia multilirata* (Sowerby G.B.II, 1870)	L73						+		E
Trivia pullex (Solander in Gray, 1870)	L73?	L73?			+	+	+	+	AM
Pusula candidula (Gaskoin, 1836)		L73						+	AM
* *Erato voluta* (Montagu, 1803)	L19	L17	+		+	+	+	+	B
Naticidae									
Natica dillwyni Payraudeau, 1826	L73?	L73?			+	+	+	+	AM
* *Natica filosa* Philippi, 1845	o	L3			+	+		+	AM
* *Natica hebraea* (Martyn, 1784)	L41	L1			+	+	+	+	AM
Natica settepassii Gaglini in Settepassi, 1985		L49			+			+	AM
* *Natica stercusmuscarum* (Gmelin, 1791)	L7	L1			+	+	+	+	AM
* *Euspira catena* (Da Costa, 1778)	L55	L11			+			+	B

Table 1 *continued*

	NA	SA	SM	BS	LB	CM	AD	WM	ZC
* *Euspira fusca* (Blainville, 1825)	L8	L9	+	+			+	+	B
* *Euspira guillemini* (Payraudeau, 1826)	o	L2	+		+	+	+	+	AM
* *Euspira macilenta* (Philippi, 1844)	o				+	+	+	+	AM
* *Euspira nitida* (Donovan, 1804)	L19	L9	+		+	+	+	+	B
* *Neverita josephinia* Risso, 1826	L7	L1	+		+	+	+	+	E
* *Payraudeautia intricata* (Donovan, 1804)	L12	L1	+		+	+	+	+	AM
Tonnidae									
* *Tonna galea* (Linnaeus, 1758)	L7	L1	+		+	+	+	+	AM
* *Galeodea echinophora* (Linnaeus, 1758)	L16	L1			+	+	+	+	E
* *Galeodea tyrrhena* (Bruguière, 1792)	o	L11			+	+	+	+	AM
* *Phalium granulatum* (Born, 1778)	L41	L14			+	+	+	+	AM
* *Phalium saburon* (Bruguièr, 1792)	L7	L1			+	+		+	AM
Ranellidae									
* *Ranella olearia* (Linnaeus, 1758)	L41					+		+	C
Cymatium corrugatum corrugatum (Lamarck, 1816)		L31	+		+	+	+	+	SE
Cymatium parthenopeum parthenopeum (Von Salis,1793)		L73			+	+		+	C
* *Cymatium tritonis variegata* (Lamarck, 1816)	o	L2			+	+	+	+	AM
Cabestana cutacea cutacea (Linnaeus, 1767)		L1				+		+	AM
Carinariidae									
Carinaria mediterranea Blainville, 1825		L2				+	+	+	AM
Atlantidae									
Atlanta fusca Souleyet, 1852	L24	L24				+		+	C
Atlanta lesueurii Souleyet, 1852	L24	L24			+	+		+	C
* *Atlanta peronii* Lesueur, 1817	L24	L2			+	+	+	+	C
* *Oxygyrus keraudrenii* (Lesueur, 1817)	L24	L2			+	+	+	+	C
Protatlanta souleyeti (Smith E.A., 1888)		L73				+		+	C
Firolidae									
Firoloida desmarestia Lesueur, 1817	L24	L3			+	+	+	+	C
Pterotrachea coronata Niebuhr, 1775 ex Forskal ms	L24	L2				+		+	SE
Pterotrachea hippocampus Philippi, 1836		L2			+	+		+	C
Pterotrachea scutata Gegenbaur, 1855	L24	L24						+	C
Triphoridae									
* *Cheirodonta pallescens* (Jeffreys, 1867)	o					+		+	AM
* *Cosmotriphora pseudocanarica* Bouchet, 1984	o					+		+	E
* *Marshallora adversa* (Montagu, 1803)	o	L2	+	+		+	+	+	AM
* *Monophorus erythrosoma* Bouchet & Guillemot, 1978	o							+	E
* *Monophorus perversus* (Linnaeus, 1758)	L73	L2	+		+	+	+	+	AM
* *Similiphora similior* Bouchet & Guillemot, 1978	o					+		+	AM
Strobiligera sp. A Bouchet, 1984		L53						+	E
* *Metaxia metaxae* (Delle Chiaje, 1828)	L73	L73			+		+	+	AM

Table 1 *continued*

	NA	SA	SM	BS	LB	CM	AD	WM	ZC
Cerithiopsidae									
* *Cerithiopsis barleei* Jeffreys, 1867	o	L75			+			+	AM
Cerithiopsis contigua Monterosato, 1878		L75						+	E
Cerithiopsis diadema Monterosato, 1874 ex Watson ms		L75			+			+	AM
Cerithiopsis jeffreysi Watson, 1885		L75						+	AM
Cerithiopsis minima (Brusina, 1865)		L21	+	+	+	+	+	+	E
* *Cerithiopsis nana* Jeffreys, 1867	o	L75				+		+	AM
* *Cerithiopsis tubercularis* (Montagu, 1803)	L73	L18	+	+	+	+	+	+	AM
* *Dizoniopsis bilineata* (Hoernes, 1848)	o	L18			+	+	+	+	E
Dizoniopsis clarkii (Forbes in Hanley, 1851)		L41			+			+	AM
* *Dizoniopsis coppolae* (Aradas, 1870)	L73	L33		+	+	+	+		E
Seila trilineata (Philippi, 1836)		L2			+	+		+	E
Janthinidae									
Janthina janthina (Linnaeus, 1758)		L1			+	+		+	C
Janthina nitens Menke, 1828		L2			+	+	+	+	AM
Aclididae									
Aclis ascaris (Turton, 1819)		L3			+			+	AM
* *Aclis attenuans* Jeffreys, 1883	o	L3					+	+	E
Aclis minor (Brown, 1827)	L73	L2			+		+	+	B
Cima minima (Jeffreys, 1858)		L3						+	AM
Graphis albida (Kanmacher, 1798)		L73	+			+	+	+	AM
Epitoniidae									
Epitonium aculeatum (Allan, 1818)		L77			+	+	+	+	B
Epitonium algerianum (Weinkauff, 1866)		L58			+			+	AM
* *Epitonium celesti* (Aradas, 1854)	o	L75				+		+	AM
* *Epitonium commune* (Lamarck, 1822)	L12	L9	+	+	+	+	+	+	E
Epitonium pseudonanum Bouchet & Warèn, 1986		L73				+		+	E
Epitonium pulchellum (Bivona Ant., 1832)	L73	L4			+	+	+	+	AM
Epitonium striatissimum (Monterosato, 1878)		L75			+			+	AM
* *Epitonium tiberii* (De Boury, 1890)	o	L58				+		+	AM
* *Epitonium turtoni* (Turton, 1819)	L64	L73	+	+	+	+	+	+	B
* *Cirsotrema cochlea* (Sowerby G.B. II, 1844)	L41	L40			+	+		+	E
* *Gyroscala lamellosa* (Lamarck, 1822)	L41	L47			+	+	+	+	AM
* *Opalia hellenica* (Forbes, 1844)	L73	L2			+	+		+	E
Punctiscala cerigottana (Sturany, 1896)		L8			+	+	+	+	AM
Eulimidae									
Eulima bilineata Alder, 1848	L73	L4			+		+	+	B
* *Eulima glabra* (Da Costa, 1778)	L2	L2			+	+	+	+	AM
Crinophtheiros comatulicola (Graff, 1875)	L73	L73						+	E
Ersilia mediterranea (Monterosato, 1869)		L72			+	+		+	E
Melanella monterosatoi (Monterosato, 1890 ex Boury ms)	L73	L49			+	+		+	AM
* *Melanella polita* (Linnaeus, 1758)	o	L11	+		+	+	+	+	B
Melanella spiridioni (Dautzenberg & Fischer P., 1896)	L73?	L73?						+	AM

Table 1 *continued*

	NA	SA	SM	BS	LB	CM	AD	WM	ZC
* *Melanella stalioi* (Brusina, 1864)	o	L49			+		+	+	AM
Parvioris microstoma (Brusina, 1864)	L73?	L73?			+	+		+	E
Pelseneeria minor Koehler & Vaney, 1908		L73			+			+	SE
Sabinella piriformis Brugnone, 1873	L73	L73				+		+	AM
Sticteulima jeffreysiana (Brusina, 1869)		L75					+	+	AM
Vitreolina antiflexa Monterosato, 1884		L49			+	+		+	AM
* *Vitreolina incurva* (B.D.D., 1883)	L73	L73	+	+	+	+	+	+	E
Vitreolina philippi (De Rayneval & Ponzi, 1854)	L73	L49	+		+	+		+	AM
NEOGASTROPODA									
Muricidae									
Murex forskoehlii Roeding, 1798		L22			+				IP
* *Bolinus brandaris* (Linnaeus, 1758)	L7	L2	+		+	+	+	+	AM
Dermomurex scalaroides (Blainville, 1829)		L2			+	+	+	+	E
* *Hadriania oretea* (De Gregorio, 1885)	L59	L9	+		+	+	+	+	E
* *Hexaplex trunculus* (Linnaeus, 1758)	L7	L1	+		+	+	+	+	AM
* *Murexsul aradasii* (Poirier, 1883 ex Monterosato ms)	L56				+	+		+	E
* *Muricopsis cristata* (Brocchi, 1814)	L12	L1	+		+	+	+	+	AM
* *Ocenebra erinaceus* (Linnaeus, 1758)	L41	L11	+	+	+	+	+	+	B
* *Ocinebrina aciculata* (Lamarck, 1822)	o	L1	+		+	+	+	+	AM
* *Ocinebrina edwardsii* (Payraudeau, 1826)	o	L1	+		+	+	+	+	AM
* *Ocinebrina hybrida* (Aradas & Benoit, 1876)	o	L49			+	+		+	E
* *Trophon echinatus* (Kiener, 1840)	L8	L2				+		+	AM
* *Trophon muricatus* (Montagu, 1803)	L8	L2	+	+	+	+	+	+	B
* *Typhinellus sowerbyi* (Broderip, 1833)	L41	L2			+	+	+	+	AM
* *Buccinulum corneum* (Linnaeus, 1758)	L41	L2			+	+	+	+	AM
* *Chauvetia affinis* (Monterosato, 1889)	o	L34				+		+	AM
* *Chauvetia brunnea* (Donovan, 1804)	L73	L25			+	+	+	+	B
Chauvetia candidissima (Philippi, 1836)		L2				+	+	+	AM
Colubraria reticulata (Blainville, 1826)		L1			+	+	+	+	AM
* *Engina leucozona* (Philippi, 1843)	o	L7	+		+	+	+	+	E
* *Pisania striata* (Gmelin, 1791)	L12	L1	+		+	+	+	+	AM
* *Pollia dorbignyi* (Payraudeau, 1826)	L56	L7			+	+	+	+	AM
* *Pollia scabra* Locard, 1886	o				+			+	E
* *Pollia scacchiana* (Philippi, 1844)	L12	L41			+	+	+	+	E
* *Coralliophila brevis* (Blainville, 1832)	o				+	+		+	AM
* *Coralliophila meyendorffii* (Calcara, 1845)	L41	L64			+	+	+	+	E
* *Coralliophila squamosa* (Bivona, 1838)	L55	L2			+	+	+	+	AM
* *Latiaxis amaliae* (Kobelt, 1907)	o	L47						+	E
* *Latiaxis babelis* (Rèquien, 1848)	o				+	+		+	AM
* *Fasciolaria lignaria* (Linnaeus, 1758)	L17	L1			+	+	+	+	E
* *Fusinus pulchellus* (Philippi, 1844)	o	L2	+		+	+	+	+	AM
* *Fusinus rostratus* (Olivi, 1792)	L19	L5			+	+	+	+	AM
Fusinus rudis (Philippi, 1844)		L73			+		+	+	E
* *Fusinus syracusanus* (Linnaeus, 1758)	L16	L1			+	+	+	+	E

Table 1 *continued*

	NA	SA	SM	BS	LB	CM	AD	WM	ZC
Latirus profetai (Nofroni, 1982)		L48							E
* *Nassarius corniculus* (Olivi, 1792)	o	L1			+	+	+	+	AM
* *Nassarius costulatus cuvierii* (Payraudeau, 1826)	L12	L1	+		+	+	+	+	AM
* *Nassarius gibbosulus* (Linnaeus, 1758)	L7	L2			+	+	+	+	E
Nassarius granum (Lamarck, 1822)		L49			+			+	E
* *Nassarius incrassatus* (Stroem, 1768)	L2	L1	+	+	+	+	+	+	B
Nassarius lima (Dillwin, 1817)		L19			+	+	+	+	AM
* *Nassarius mutabilis* (Linnaeus, 1758)	L12	L2			+	+	+	+	AM
* *Nassarius pygmaeus* (Lamarck, 1822)	o	L2	+		+	+	+	+	B
* *Nassarius reticulatus* (Linnaeus, 1758)	L7	L9	+	+	+	+	+	+	B
* *Nassarius turulosus* (Risso, 1826)	o				+	+		+	E
* *Cyclope neritea* (Linnaeus, 1758)	L7	L2	+	+	+	+	+	+	AM
* *Cyclope pellucida* Risso, 1826	o	L35		+		+		+	AM
Cyclope westerlundi Brusina, 1900	L65?	L65?	+	+					E
* *Rapana venosa* (Valenciennes, 1846)	L74			+			+	+	IP
* *Stramonita haemastoma* (Linnaeus, 1766)	L16	L10		+		+		+	AM
Columbellidae									
* *Columbella rustica* (Linnaeus, 1758)	L7	L1	+		+	+	+	+	AM
Mitrella coccinea (Philippi, 1836)	L73?	L73?					+	+	E
* *Mitrella gervillii* (Payraudeau, 1826)	L41	L1			+	+		+	AM
* *Mitrella minor* (Scacchi, 1836)	o	L75			+	+		+	AM
Mitrella pediculus (Kobelt, 1895)		L73			+	+		+	E
* *Mitrella scripta* (Linnaeus, 1758)	L12	L1	+		+	+	+	+	AM
Mitrella spelta (Kobelt, 1893)		L49			+	+		+	AM
Costellariidae									
* *Vexillum ebenus* (Lamarck, 1811)	L12	L9	+		+	+	+	+	AM
Vexillum littorale (Forbes, 1844)	L12	L2	+		+	+	+	+	E
* *Vexillum savignyi* (Payraudeau, 1826)	o	L1			+	+	+	+	E
* *Vexillum tricolor* (Gmelin, 1790)	o	L2	+		+	+	+	+	E
* *Gibberula miliaria* (Linnaeus, 1758)	o	L1			+	+	+	+	AM
* *Gibberula philippii* (Monterosato, 1878)	o	L41			+	+		+	AM
* *Volvarina mitrella* (Risso, 1826)	o	L2			+	+	+	+	AM
* *Granulina boucheti* Gofas, 1992	o	L78						+	E
* *Granulina marginata* (Bivona, 1832)	o	L76				+		+	E
* *Granulina occulta* (Monterosato, 1869)	o	L8		+		+		+	SE
Mitridae									
* *Mitra cornicula* (Linnaeus, 1758)	L55	L1			+	+	+	+	AM
Mitra nigra (Gmelin, 1791)		L1				+		+	SE
* *Mitra zonata* Marryat, 1818	L41	L73			+		+	+	AM
Conidae									
* *Conus mediterraneus* Hwass in Bruguière, 1792	L7	L2	+		+	+	+	+	E
Turridae									
* *Bela brachystoma* (Philippi, 1844)	o	L75			+	+	+	+	AM
* *Bela laevigata* (Philippi, 1836)	o	L18	+		+	+	+	+	AM
* *Bela menkhorsti* Aartsen, 1988	L59	L73			+	+	+	+	E

Table 1 *continued*

	NA	SA	SM	BS	LB	CM	AD	WM	ZC
* *Bela nebula* (Montagu, 1803)	L2	L1	+	+	+	+	+	+	B
Bela ornata (Locard, 1897)		L38	+					+	AM
Benthomangelia macra (Watson, 1881)	L8	L8			+	+		+	AM
* *Clathromangelia fehri* Aartsen & Zenetos, 1987	o	L63							E
* *Clathromangelia quadrillum* (Dujardin, 1837)	L73	L8			+	+		+	E
* *Fehria taprunensis* (Pallary, 1904)	o	L38				+	+		E
Fehria zenetouae Aartsen, 1988		L67			+				E
* *Gymnobela abyssorum* (Locard, 1897)	o	L75			+	+		+	AM
* *Mangelia attenuata* (Montagu, 1803)	L41	L1			+	+	+	+	B
Mangelia coarctata (Forbes, 1840)		L49			+	+		+	B
Mangelia costata (Donovan, 1804)	L73	L49		+		+		+	B
* *Mangelia costulata* (Blainville, 1829)	o	L18	+		+	+	+	+	AM
* *Mangelia nuperrima* (Tiberi, 1855)	L8	L73				+		+	AM
* *Mangelia paciniana* (Calcara, 1839)	o	L77				+	+	+	AM
* *Mangelia scabrida* (Monterosato, 1890)	o	L73				+	+	+	AM
* *Mangelia stossiciana* Brusina, 1869	o	L73?			+	+	+	+	AM
* *Mangelia unifasciata* (Deshayes, 1835)	o	L1	+		+	+	+	+	AM
* *Mangelia vauquelini* (Payraudeau, 1826)	L41	L1	+		+	+	+	+	AM
Mangiliella barashi Aartsen & Fehr-De Wal, 1978		L39			+				E
* *Mangiliella bertrandii* (Payraudeau, 1826)	o	L1			+	+	+	+	E
* *Mangiliella caerulans* (Philippi, 1844)	L73	L38				+	+	+	E
* *Mangiliella fieldeni* Aartsen & Fehr-De Wal,1978 ex Monts ms	o					+			E
* *Mangiliella multilineolata* (Deshayes)	o	L1				+	+	+	AM
Mangiliella secreta Aartsen & Fehr-De Wal,1978 ex Monts ms		L49				+			E
Mangiliella sicula (Reeve, 1846)	L73	L73					+	+	E
* *Mangiliella taeniata* (Deshayes, 1835)	o	L1			+	+	+	+	AM
Taranis moerchi (Malm, 1863)		L73			+	+		+	B
Drilliola emendata (Monterosato, 1872)		L2				+	+	+	AM
* *Microdrillia loprestiana* (Calcara, 1841)	L8	L8			+	+		+	AM
Haedropleura rigida (Reeve, 1846)		L37			+	+			B
Haedropleura secalina (Philippi, 1844)		L75						+	E
* *Haedropleura septangularis* (Montagu)	L12	L77			+	+	+	+	B
* *Pleurotomella eurybrocha* (Dautzenberg & Fischer)	o	L73			+		+	+	AM
Pleurotomella gibbera Bouchet & Waren, 1980 ex Jeffreys ms		L75						+	AM
* *Crassopleura incrassata* (Dujardin, 1837)	o	L2			+	+	+	+	AM
Mitrolumna crenipicta Dautzenberg, 1889		L38			+	+		+	AM
* *Mitrolumna olivoidea* (Cantraine, 1835)	o	L2			+	+	+	+	AM
Raphitoma aequalis (Jeffreys, 1867)	L73?	L73?						+	E
* *Raphitoma concinna* (Scacchi, 1836)	o	L77				+	+	+	AM
* *Raphitoma echinata* (Brocchi, 1814)	o	L2			+	+	+	+	AM
* *Raphitoma erronea* (Monterosato, 1884)		L75				+		+	E

Table 1 *continued*

	NA	SA	SM	BS	LB	CM	AD	WM	ZC
* *Raphitoma laviae* (Philippi,1844)	o	L73?				+		+	E
* *Raphitoma linearis* (Montagu, 1803)	o	L9			+	+	+	+	B
Raphitoma leufroyi (Michaud, 1828)		L1			+	+	+	+	AM
* *Raphitoma pupoides* (Monterosato, 1884)		L73?			+	+		+	AM
* *Comarmondia gracilis* (Montagu, 1803)	L73	L73	+		+	+	+	+	B
* *Philbertia alternans* Monterosato, 1884	o		+		+			+	AM
* *Philbertia bracteata* (Pallary, 1904)	o				+			+	E
* *Philbertia cordieri* (Payraudeau, 1826)	L73	L1	+		+	+		+	AM
* *Philbertia densa* Monterosato, 1884	o	L73?			+	+		+	E
Philbertia horrida Monterosato, 1884	L73?	L73?				+	+	+	E
* *Philbertia philberti* (Michaud, 1829)	L12	L1	+		+	+	+	+	AM
* *Philbertia pruinosa* Pallary, 1906	o					+		+	E
* *Philbertia pseudohystrix* (Sykes, 1906)	o	L77			+	+		+	E
* *Teretia teres* (Reeve, 1844)	L8	L2					+	+	AM

Sources:

L1 Deshayes 1835
L2 Forbes 1844
L3 Jeffreys 1883a
L4 Jeffreys 1883b
L5 Steindachner 1891
L6 Monterosato 1892
L7 Carus 1893
L8 Sturany 1896
L9 Marion 1898
L10 Panagiotopoulos 1916
L11 Athanasopoulos 1917
L12 Pallary 1917
L13 Bisacchi 1928
L14 Tortonese 1947
L15 Huvé 1957
L16 Sakellariou 1957
L17 Pérès & Picard 1958
L18 Oberling 1960–62
L19 Jacquotte 1962
L20 Kisseleva 1963
L21 Ledoyer 1966
L22 Settepassi 1967
L23 Settepassi 1968
L24 Kiortsis 1969
L25 Ledoyer 1969
L26 Geldiay & Kocatas 1972
L27 Nordsieck 1972a
L28 Fielding & Edmunds 1973
L29 Nordsieck 1973a
L30 Nordsieck 1973b
L31 Franchini 1974
L32 Radoman 1974
L33 Nordsieck 1976a
L34 Nordsieck 1976b
L35 Paget 1976
L36 Verduin 1976a
L37 Nordsieck 1977a
L38 Nordsieck 1977b
L39 Aartsen & Fehr-De Wal 1978
L40 D'Angelo & Gargiullo 1978
L41 Koroneos 1979
L42 Verduin 1979
L43 Panetta 1980
L44 Warén 1980
L45 Aartsen 1982a
L46 Aartsen 1982b
L47 Nofroni 1982a
L48 Nofroni 1982b
L49 Nordsieck 1982
L50 Verduin 1982a
L51 Verduin 1982b
L52 Verduin 1983
L53 Bouchet 1984
L54 Verduin 1984
L55 Frank 1985
L56 Koukouras et al. 1985
L57 Verduin 1985
L58 Bouchet & Warén 1986
L59 Dounas 1986
L60 Nicolay 1986
L61 Oliverio 1986
L62 Verduin 1986b
L63 Aartsen & Zenetos 1987
L64 Dimitrakis 1987
L65 Nofroni 1987
L66 Chintiroglou 1987
L67 Aartsen 1988b
L68 Aartsen & Menkhorst 1988
L69 Nicolay & Angioy 1988
L70 Verduin 1988
L71 Barash & Danin 1988/1989
L72 Hoenselaar & Hoenselaar 1989
L73 Tenekidis 1989
L74 Koutsoubas & Voultsiadou-Koukoura 1991
L75 Zenetos et al. 1991
L76 Gofas 1992
L77 Koutsoubas et al. 1992
L78 Aartsen 1993
L79 Zenetos & Aartsen 1994

Family: TRIPHORIDAE

Cheirodonta pallescens (Jeffreys, 1867)

Cheirodonta pallescens, Bouchet, 1984, p. 52, figs. 3, 10–11, 34.

Material. st. 147, 12 specimens (9 shells), 10.5 m, coarse sand.

Distribution. Mediterranean: after the revision of the family, it was found in Spanish coasts (Luque, 1986; Ballesteros et al., 1986; Templado, 1984), Corsica and Jerba (Bouchet, 1984). Eastern Atlantic: European coasts (Bouchet and Guillemot, 1978; Bouchet, 1984).

Monophorus erythrosoma (Bouchet and Guillemot, 1978)

Triphora erythrosoma, Bouchet and Guilllemot, 1978, p. 352, figs. 8, 23, 38.

Material. st. 147, 4 specimens (shells), 18 m, rhizomes of *Posidonia*.

Distribution. Mediterranean: Spanish coasts (Templado, 1982, 1984; Ballesteros et al., 1986); Port-Vendres (Bouchet and Guillemot, 1978). Eastern Atlantic: Gulf of Gascogne to Bretagne (Bouchet, 1984).

Similiphora similior (Bouchet and Guillemot, 1978)

Triphora similior, Bouchet and Guillemot, 1978, p. 352, figs. 8, 14.

Material. st. 146a, 14 specimens (10 shells), 15 m, rhizomes of *Posidonia*.

Distribution. Mediterranean: Spanish coasts (Ballesteros et al., 1986; Luque, 1986; Templado, 1986); Sete, Corsica, Jerba (Bouchet, 1984). Eastern Atlantic: French and Spanish coasts (Bouchet and Guillemot, 1978; Bouchet, 1984).

Cosmotriphora pseudocanarica Bouchet, 1984

Cosmotriphora pseudocanarica, Bouchet, 1984, p. 40, figs. 1, 40.

Material. st. 133, 3 specimens (shells), 17 m, on colonies of the scleractinian *Cladocora caespitosa* (Linnaeus).

Distribution. Mediterranean: Oran, Lipari, Catania, and Porto Cesareo (Bouchet, 1984).

Family: OVULIDAE

Aperiovula adriatica (Sowerby G.B., 1828)

Pseudosimnia adriatica, Sabelli, 1972, p. 59, fig. 4.

Material. st.C, 1 specimen, 75 m, biogenic detritus, st. K, 1 specimen (shell), 27m, sand.

Distribution. Mediterranean: various areas of the western basin (Philippi, 1836; Hidalgo, 1870; Carus, 1893; etc.); Adriatic Sea (Coen, 1914; Sabelli, 1972; etc.).

Neosimnia spelta (Linnaeus, 1758)

Simnia spelta, Ghisotti and Melone, 1969 in Ghisotti, 1968/78, figs. 1–12.

Material. stations 131 and 145a, 2 specimens, 38–50m, coralligenous, on colonies of the gorgonacean *Eunicella singularis* (Esper).

Distribution. Mediterranean: various areas of the western basin (Philippi, 1836;

Hidalgo, 1870; Carus, 1893; Ghisotti and Melone, 1969 in Ghisotti, 1968/78; etc.); Adriatic Sea (Carus, 1893; Coen, 1914; etc.); Ionian Sea (Grecchi, 1984).

Family: TURRIDAE

Mangiliella fieldeni Aartsen and Fehr-De Wal, 1978 ex Monterosato ms

Mangiliella fieldeni, Aartsen and Fehr-De Wal, 1978, p. 104, fig. 4.

Material. st. 145a, 4 specimens (shells), 20 m, gravels sand 90%.

Distribution. Mediterranean: only from Sicily, Malta, and Sfax (Aartsen and Fehr-De Wal, 1978).

Philbertia pruinosa Pallary, 1906

Philbertia pruinosa, Pallary, 1906, p. 80, pl. IV figs. 2, 3.

Material. st. 149a, 1 specimen (shell), 5 m, *Zostera* in fine sand 80%.

Distribution. Mediterranean: only from the central Tyrrhenian Sea (Bogi et al., 1980b) and the Gulf of Gabes (Pallary, 1906).

B. New records for the prosobranch mollusc fauna of the Aegean Sea

Family: FISSURELLIDAE

Emarginula solidula Costa O.G., 1829

Emarginula solidula, Costa O.G., 1829, p. 123; Piani, 1984, p. 209, figs. 37–42, 112.

Material. stations 129 and 146, 3 specimens, 2–3 m, rocks with the sponge *Aplysina aerophoba* (Schmidt).

Distribution. Mediterranean: various areas of the western basin (Costa, 1829; Philippi, 1836; Piani, 1984; etc.); Adriatic Sea (Ghisotti and Melone, 1969); coasts of Alexandria (Pallary, 1912). Eastern Atlantic: Morocco (Pasteur-Humbert, 1962; etc.).

Family: TROCHIDAE

Putzeysia wiseri (Calcara, 1842)

Calliostoma wiseri, Ghisotti and Melone, 1971, p. 65, fig. 10.30.

Putzeysia wiseri, Guidastri et al., 1984, p. 125, figs. 1–15.

Material. st. H1, 1 specimen (shell), 900m, mud with Thecosomata shells.

Distibution. Mediterranean: various areas (Carus, 1893; Nordsieck, 1973e; Guidastri et al., 1984; Janssen, 1989; etc.). Eastern Atlantic: coasts of Europe (Carus, 1893; etc.).

Family: RISSOIDAE

Benthonella tenella (Jeffreys, 1869)

Cithna tenella, Di Geronimo and Panetta, 1973, p. 74, Tav. I fig. 2a–b.

Material. st. H1, 4 specimens (shells), 500–900 m, mud with Thecosomata shells.

Distribution. Mediterranean: various areas (Carus, 1893; Nordsieck, 1971; Di Geronimo and Panetta, 1973; Grecchi, 1984; Janssen, 1989; etc.). Eastern Atlantic: European coasts south to Azores and Morocco (Pasteur-Humbert, 1962; Di Geronimo and Panetta, 1973).

Family: NATICIDAE

Euspira macilenta (Philippi, 1844)

Natica macilenta, Philippi, 1844, p. 140, Tav. XXIV fig. 14.

Lunatia macilenta, Schiro, 1977, p. 16, pl. 1 figs. 5–8.

Material. stations C, I, J, K and E, 28 specimens (15 shells), 65–90 m, sandy mud.

Distribution. Mediterranean: well known from western and Ionian basins and Adriatic Sea (Carus, 1893; D'Angelo and Gargiullo, 1978; etc.), only from Israel coast in Levantine basin (Janssen, 1989). Eastern Atlantic: European coast south to Morocco (Pasteur-Humbert, 1962; Nordsieck, 1982; etc.).

Family: MURICIDAE

Pollia scabra Locard, 1886

Cantharus scaber, Sabelli and Spada, 1986, fig. 3.

Material. st. 135, 3 specimens (shells), 5 m, on colonies of the scleractinian *Cladocora caespitosa* (Linnaeus), st. 138a, 1 specimen (shell), 60m, on a dead colony of the gorgonacean *Corallium rubrum* (Linnaeus).

Distribution. Mediterranean: various areas (Carus, 1893; Pallary, 1938; Sabelli and Spada, 1986; etc.).

Coralliophila brevis (Blainville, 1832)

Coralliophila brevis, Sabelli and Spada, 1980, fig. 5a–c.

Material. st. 138a, 1 specimen, 80 m, on a colony of *Corallium rubrum* (Linnaeus).

Distribution. Mediterranean: various areas of the western basin (Philippi, 1836; Carus, 1893; Settepassi, 1971; etc.); Shiqmona Israel (Nordsieck, 1973c). Eastern Atlantic: Canary Islands (Nordsieck and Garcia-Talavera, 1979).

Nassarius turulosus (Risso, 1826)

Nassarius turulosus, Nofroni, 1986, p. 21, Tav. XXXI fig. 4.

Material. st. H1, 5 specimens (shells), 300 m, mud.

Distribution. Mediterranean: Nice (Carus, 1893); Corsica, Sicily (Monterosato, 1890); Haifa, Israel (Haas, 1951). Eastern Atlantic: Portuguese coasts (Nordsieck, 1982).

Family: TURRIDAE

Philbertia alternans Monterosato, 1884

Philbertia bucquoi, Nordsieck, 1982, p. 275, Taf. 103 fig. 98.33.

Philbertia alternans, Sabelli et al., 1990, p. 216.

Material. st. 108, 1 specimen (shell), 5 m, sand; st. 135, 1 specimen, 12 m, rocks with calcareous algae and small colonies of *C. caespitosa*.

Distribution. Mediterranean: Ibiza, Marseilles (Nordsieck, 1977b); Sea of Marmara (Pallary, 1917); Tartous Syria (Pallary, 1938). Eastern Atlantic: European coasts (Nordsieck, 1977b).

Philbertia bracteata (Pallary, 1904)

Homotoma bracteata, Pallary, 1904, p. 220, pl. VII fig. 4.

Philbertia bracteata, Sabelli et al., 1990, p. 216.

Material. st. 145a, 1 specimen (shell), 22 m, very coarse sand.

Distribution. Mediterranean: Only from Gulf of Gabes (Pallary, 1904) and Haifa, Israel (Nordsieck, 1977b).

Tenekidis (1989) had reported the species *Alvania geryonia, Hydrobia acuta, Vermetus granulatus, Mangelia stossiciana, Raphitoma laviae, Raphitoma pupoides,* and *Philbertia densa* (Table 1) from the Greek seas without specifying the areas sampled. Consequently, their finding in the North Aegean Sea [from the stations (103, 104, 105, 106, 108, 145, 146a); (165a); (175); (146); (131, 135, 145a); (110, E), and (131), respectively] documents their presence in the Aegean for the first time.

C. New records for the North Aegean Sea

Apart from the above species being new records for the prosobranch mollusc fauna of the Eastern Mediterranean or the Aegean Sea, 100 of the 279 species found, are new for the prosobranch mollusc fauna of the North Aegean Sea (Table 1). Comments on the distribution status of some of these species are given below:

Rissoa auriformis pseudomonodonta (st. 155a), *Rissoa rhodhensis* (st. 148), and *Clathromangelia fehri* (st. H1) were known until now only from their type localities: Ionian, Levantine basin, and South Aegean Sea, respectively (Verduin, 1983, 1985; Aartsen and Zenetos, 1987).

Simnia purpurea (st. 140a), *Cerithiopsis barleei* (st. 146a), *Latiaxis amaliae* (st. 153, E, J), *Granulina marginata* (st. 140), and *Granulina boucheti* (st. 133, 135) are reported for the second time from the Eastern Mediterranean.

Tenagodus obtusus (st. H1), *Alvania scabra* (st. E), *Alvania testae* (st. H1, E), *Nodulus contortus* (st. 122), *Aclis attenuans* (st. K), and *Raphitoma echinata* (st. 131) are reported from the Aegean more than a century after their first record from this sea (Forbes, 1844; Jeffreys, 1883 a,b; Carus, 1893).

Finally, *Trivia multilirata* (st. 138a), *Cerithiopsis nana* (st. 66), *Dizoniopsis coppolae* (st. 146a), *Epitonium celesti* (st. H1), *Epitonium tiberii* (st. H1), *Chauvetia affinis* (st. 124, I), *Fehria taprunensis* (st. 148), and *Pleurotoma eurybrocha* (st. H1) are rare in the Mediterranean.

DOUBTFUL RECORDS OF PROSOBRANCH MOLLUSCS IN THE AEGEAN SEA

The following 39 species have also been recorded from the Aegean Sea, but they have not been considered as elements of the Aegean prosobranch mollusc fauna, either because they are invalid species, or because their presence in the Mediterranean Sea is uncertain and their recording is probably based on erroneus identification.

Patella vulgata Linnaeus, 1758. Saronikos Gulf (Athanasopoulos, 1917); Rhodes Is. (Paget, 1976). A northern Atlantic species (Christiaens, 1973).

Patella depressa Pennant, 1777. Rhodes Is. (Paget, 1976). "Nomen dubium" (Christiaens, 1973).

Emarginula multistriata Jeffreys, 1882. Greek seas (Tenekidis, 1989). Known only as fossil in the Mediterranean (Piani, 1984).

Emarginula crassa Sowerby, 1813. Saronikos Gulf (Tenekidis, 1989). An Atlantic species (Fretter and Graham, 1976).

Clanculus kinzelbachi Nordsieck, 1982. Karpathos Is. (Nordsieck, 1982). From the original diagnosis and figure we concluded it is only a form of the variable species *Clanculus jussieui* (Payraudeau, 1826).

Gibbula deversa Milasckewitch, 1916. Saronikos Gulf (Nordsieck, 1982). The validity of this species is under consideration (Ghisotti and Melone, 1972; Grossu, 1986).

Jujubinus unidentatus (Philippi, 1844). Skyros Is. (Koroneos, 1979); Greek seas (Tenekidis, 1989). Judging from the figures given by the above authors, we think that in both cases we have erroneous identifications. This species is considered as endemic to the Gulf of Gabes (Ghisotti and Melone, 1975; Cretella, 1992).

Tricolia hoberti (Brusina, 1874). Greek seas (Tenekidis, 1989). It is a junior synonym of *Tricolia pullus* (Linnaeus, 1758) according to Gofas (1982).

Bittium depauperatum Watson, 1897. Judging from the figures given for the specimens from Karpathos Is. (Nordsieck, 1976c) and Saronikos Gulf (Tenekidis, 1989), we think that these must be considered as forms of the variable species *Bittium reticulatum* (Da Costa, 1778). *B. depauperatum* is an eastern Atlantic species (Nordsieck, 1976c).

Turritella monterosatoi Kobelt, 1888. Saronikos Gulf (Nordsieck, 1982). As this species is known only from the Atlantic coasts of southern Spain (Aartsen et al., 1984) and the author only presented in his figure a small part of the shell, a fact which does not allow its distinction from other species of the genus. We consider its presence in Saronikos Gulf uncertain.

Littorina littorea (Linnaeus, 1758). Aegean (Belloc, 1948). An Atlantic species distributed as far as the Straits of Gibraltar (Fretter and Graham, 1980; Nicolay and Angioy, 1988).

Littorina obtusata (Linnaeus, 1758). Saronikos Gulf (Athanasopoulos, 1917). An Atlantic species with questionable presence in the Mediterranean (Fretter and Graham, 1980; Nicolay and Angioy, 1988).

Rissoa auriformis auriformis Pallary, 1904. Saronikos Gulf (Tenekidis, 1989). An endemic subspecies of the Gulf of Gabes (Verduin, 1983).

Rissoa rubrocincta Danilo and Sandri in Brusina, 1866. Greek seas (Tenekidis, 1989). An invalid species (Oliverio et al., 1986).

Rissoa guerinii Rècluz, 1843. Crete Is. (Jeffreys, 1883a); Saronikos Gulf (Oberling, 1960–62); Santorini Is. (Ledoyer, 1969). A species distributed only in the Western Mediterranean (Verduin, 1985).

Rissoa angustior (Monterosato, 1917). Greek seas (Tenekidis, 1989). "Nomen dubium" (Verduin, 1985).

Alvania monterosatoi (Fischer, 1877). Rhodes Is. (Fischer, 1877); Ammouliani Is. (Frank, 1985). This species is known only from empty shells collected mainly from fossiliferous substrata (Oliverio et al., 1986).

Alvania pseudorudis Aartsen. Saronikos Gulf, Rhodes Is. (Tenekidis, 1989). Judging from the figure and the sites given by Tenekidis, we think it is the species *Alvania gittenbergeri* described as sp. n. by Aartsen and Menkhorst (1988) (the authors based their description on their own specimens as well as specimens from Saronikos Gulf and Rhodes Is. sent to them by Tenekidis). The latter proved to be a junior synonym (Amati et al., 1988) of the species *Alvania litoralis*

(Nordsieck, 1972).

Cingula cingilus (Montagu, 1803). Aegean (Forbes, 1844). An Atlantic species with questionable presence in the Mediterranean (Aartsen et al., 1984).

Pusillina gemmula (Fischer, 1871). Greek seas (Tenekidis, 1989). An invalid species (Oliverio et al., 1986).

Turboella cornea (Lovèn, 1846). Greek seas (Tenekidis, 1989). A junior synonym of *Rissoa membranacea* (Adams J., 1800) according to Fretter and Graham (1978), distributed along the northeastern Atlantic coasts of Europe (Verduin, 1982b).

Caecum glabrum (Montagu, 1803). Lesvos Is. (Wawra, 1974). A northern Atlantic species not present in the Mediterranean (Aartsen, 1977; Panetta, 1980).

Krebsia intorta Lamarck, 1822. Evia Is. (Koroneos, 1979). A western Atlantic species (Nordsieck, 1982). Judging from Koroneos' figure, we think it is a young specimen of the species *Capulus hungaricus* (Linnaeus, 1758).

Vermetus corneus Forbes, 1844. Cyclades Is., Crete and coasts of Asia Minor (Forbes, 1844). It must be considered as an "Incertae sedis" species since the original diagnosis is insufficient to distinguish it from other species of the family Vermetidae and Forbes' material is lost.

Marsenina glabra (Couthoy, 1838). Saronikos Gulf (Tenekidis, 1989). As no description is given and the shell figure is inadequate for the identification of this northern Atlantic species (Nordsieck, 1982), we think that possibly the author refers to the common species *Lamellaria perspicua* (Linnaeus, 1758).

Triphora grimaldii (Dautzenberg and Fischer, 1906). Greek seas (Tenekidis, 1989). It is a junior synonym of *Cosmotriphora melanura* (Adams, 1850) occurring in the Atlantic, according to Bouchet (1984). In any case, Tenekidis' figure shows a specimen of the species *Marshallora adversa* (Montagu, 1803).

Cerithiopsis fayalensis Watson, 1886. Saronikos and Evoikos Gulfs (Tenekidis, 1989). The figure given shows a form of the common variable species *Cerithiopsis tubercularis* (Montagu, 1803).

Amaea smithi (Watson, 1897). Saronikos Gulf (Tenekidis, 1989). A junior synonym of *Epitonium tryoni* (De Boury, 1913) according to Bouchet and Waren (1986). We think that the specimen figured by Tenekidis is actually a different species, *Epitonium pseudonanum* (Bouchet and Waren, 1986).

Eulima unifasciata Forbes, 1844. Coasts of Asia Minor (Forbes, 1844). Nordsieck (1977a) transferred the species to the genus *Leiostraca* Adams H. and A., 1853 without giving additional descriptional comments. We consider it as an "Incertae sedis" species since the original diagnosis is insufficient to distinguish it from other species of the family Eulimidae and Forbes' material is lost.

Eulima trunca Watson, 1897. Saronikos and Evoikos Gulfs (Tenekidis, 1989). Bouchet and Waren (1986) who have reviewed the European species of the family Eulimidae do not even mention this species, possibly considering it invalid.

Buccinum undatum Linnaeus, 1758. Saronikos Gulf (Athanasopoulos, 1917). An Atlantic species not living in the Mediterranean (Sabelli and Spada, 1985; Bouchet and Waren, 1985).

Chauvetia ventrosa Nordsieck, 1976. Paros Is. (Nordsieck, 1976b); Saronikos and Evoikos Gulfs (Tenekidis 1989). An invalid species (Piani, 1980; Bruschi et al., 1985).

Colus jeffreysianus (Fischer, 1898). Saronikos Gulf (Athanasopoulos, 1917). An Atlantic species occurring in the Mediterranean as far as Alboran Sea (Bouchet and Waren, 1985). Without examination of the original material, little can be said about its identity.

Coralliophila carinata Koroneos, 1979. Gerochristos Is., Sithonia coasts at Chalkidiki Penin-

sula (Koroneos, 1979). Judging from the original diagnosis and the figures given for the holotype, we think that it is identical with the species *Latiaxis babelis* (Rèquien, 1848).

Nucella lapilus (Linnaeus, 1758). Saronikos Gulf (Athanasopoulos, 1917). Athanasopoulos recorded that the species is "very common" in this gulf. This record must be considered with a great deal of reserve, since the species is a northeastern Atlantic one, and even the few records from the Western Mediterranean have not been documented (Settepassi, 1971).

Mitrella decollata (Brusina, 1865). Saronikos Gulf (Tenekidis, 1989). It is a form of the rather common variable species *Mitrella gervillii* (Payraudeau, 1826) according to Aartsen et al. (1984), and this form is distributed mainly in the Adriatic (Sabeli and Spada, 1981).

Cythara difficilis (Locard and Caziot, 1900). Greek seas (Tenekidis, 1989). An invalid species (Aartsen and Fehr-De Wal, 1978).

Raphitoma bicolor (Risso, 1826). Greek seas (Tenekidis, 1989). An invalid species (Aartsen et al., 1984).

Raphitoma servaini (Locard, 1897). Saronikos Gulf (Tenekidis, 1989). Nordsieck (1977b) described a new subspecies (*R. servaini farolita*) of this Atlantic species, from Ibiza and Brindisi, but Bouchet and Waren (1980), who have reviewed the Atlantic species of the family Turridae, do not even mention this species, probably considering it invalid.

Ten additional species. [*Bittium atticum* Nordsieck, 1976; *Cerithium anguistissimum* Forbes, 1844; *Rissoina decussata* (Montagu, 1803); *Eulima perminima* Jeffreys, 1883; *Pleurotoma fallax* (Forbes, 1844), *Pleurotoma abyssicola* (Reeve, 1844), *Pleurotoma aegeensis* (Reeve, 1844), *Pleurotoma minuta* (Reeve, 1844), *Pleurotoma lysiaca* (Reeve, 1844), *Pleurotoma cycladensis* (Reeve, 1844)] are also not considered as elements of the Aegean prosobranch fauna, as pointed out by Waren (1980), Verduin (1982a), Bouchet (1984), Oliverio et al. (1986), and Aartsen (1988a).

REMARKS ON THE PROSOBRANCH MOLLUSC FAUNA OF THE MAIN AREAS OF THE MEDITERRANEAN AND THE BLACK SEA

According to the relevant literature (Carus, 1893; Nordsieck, 1968, 1972a, 1982; Parenzan, 1970; Piani, 1980; Bruschi et al., 1985; Bouchet and Taviani, 1989; Oliverio and Amati, 1990; Sabelli et al., 1990; Pope and Goto, 1991; Gofas, 1992; Waren, 1992; Misfud, 1993), the known number of the Mediterranean prosobranch molluscs is estimated to be 737 species (species with systematic identity doubtful or of unconfirmed presence in the Mediterranean were not included in the estimation).

Western Mediterranean Basin. On the basis of the existing literature (Costa, 1829; Philippi, 1836, 1844; Bucquoy et al., 1882–1886; Monterosato, 1877a,b; 1890; Bellini, 1929; Settepassi, 1967, 1971; Ghisotti and Melone, 1969, 1970, 1971, 1972, 1975; Nordsieck, 1972a; 1973a,d; 1976a,b,c ; Verduin, 1976a,b; 1982a,b; 1983; 1984; 1985; 1986a,b; 1988; Aartsen and Fehr-De Wal, 1978; D'Angelo and Gargiullo, 1978; Bogi et al., 1979; 1980a,b,c; Bouchet and Waren, 1980, 1985, 1986; Terreni, 1981; Templado, 1982, 1984; Torelli, 1982; Aartsen et al., 1984; Ballesteros et al., 1986; Luque, 1986), the known number of the prosobranch mollusc fauna of this area is estimated to be 653 species, corresponding to 88.6% of the Mediterranean species (Fig. 2). Of the 737

Mediterranean species, only 84 species have not been found in this area but are known from one or more from the other Mediterranean areas and the Black Sea.

Central Mediterranean. After the review of the relevant literature (Dautzenberg, 1883; Pallary, 1904, 1906; Monterosato, 1917; Micallef and Evans, 1968; Parenzan, 1969, 1977; Oriolo, 1971; Ghisotti, 1972; Di Geronimo and Panetta, 1973; Spada et al., 1973; Vatova, 1974, 1975; Panetta, 1977; Cachia, 1981; Richards, 1983; Tiganus, 1984; Misfud, 1992, 1993), the fauna of this area includes 395 prosobranch species (53.6% of the known Mediterranean species) (Fig. 2).

Adriatic Sea. The prosobranch mollusc fauna of the Adriatic Sea is fairly well studied (eg., Carus, 1893; Coen, 1914; Odhner, 1914; Vatova, 1949; Riedl, 1963; Gamulin-Brida, 1967; Stjepcevic et al., 1982; Piani, 1984; Cossignani et al., 1992). According to the above literature the prosobranch fauna of that sea consists of 299 species (40.6% of the total Mediterranean species) (Fig. 2).

Levantine Basin. The prosobranch mollusc fauna of this basin consists of 378 species (51.3% of the total Mediterranean species (Fig. 2), according to the relevant literature (Pallary, 1912, 1938; Gruvel and Moazzo, 1931; Steuer, 1939; Haas, 1937, 1951; Demetropoulos, 1969, 1971; Spada, 1971; Yaron, 1971, 1972; Nordsieck, 1972b, 1973c; Demetropoulos and Hadjichristophorou, 1976; Por, 1978; Mienis, 1981; Barash and Danin, 1972; 1977; 1982a,b; 1986; 1992; Tornaritis, 1987). Among these species, 30 are of Indo-Pacific origin and are considered as Lessepsian migrants; 14 of these are characterized as successful Indo-Pacific immigrants in the Mediterranean, while the rest are characterized as occasional (Barash and Danin, 1992). The Levantine Basin can be

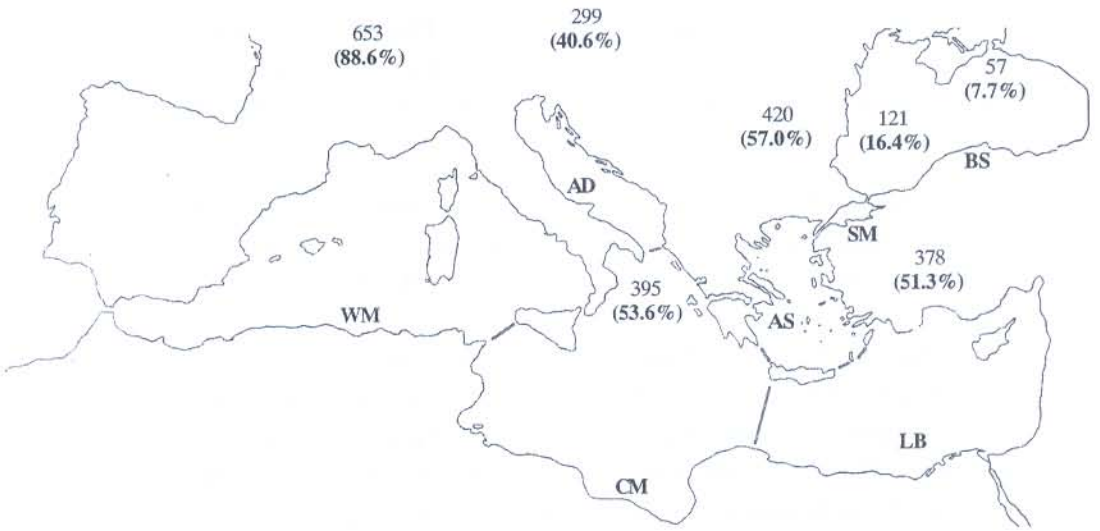

Fig. 2. Distribution of prosobranch molluscs in various areas of the Mediterranean and the Black Sea in numbers and as percentages of the total prosobranch Mediterranean species. WM = Western Mediterranean; AD = Adriatic Sea; CM = Central Mediterranean; AS = Aegean Sea; SM = Sea of Marmara; BS = Black Sea; LB = Levantine Basin.

considered as a rather well studied area of the Mediterranean, however the number of species known from this area is considerably lower than that known from the Western Mediterranean. This difference could be attributed to the fact that the Levantine Basin is the most oligotrophic area of the Mediterranean and is also an extemely stressed marine environment, with a 30% impoverishment in the general diversity of its marine biota (Por and Dimentman, 1989).

Sea of Marmara. Data on the prosobranch mollusc fauna species of this area have been provided mainly by Ostroumoff (1896), Marion (1898), Pallary (1917), Demir (1952–54), Kaneva-Abadjieva (1959), and Oberling (1960–62, 1969–71). Ecological information on the molluscan fauna of that area has been given by Caspers (1957, 1968). According to the above literature, the total number of known prosobranchs from this area is estimated at 121 species (16.4% of the total Mediterranean species) (Fig. 2). The small number of the known species from this area could be attributed to the fact that it suffers from an influx of Black Sea waters rather than to a lack of intensive research (Caspers, 1968). This area can be considered as transitional between the Mediterranean and the Black Sea.

Black Sea. Only 57 species (7.7% of the total Mediterranean species) have been recorded from the Black Sea (Fig. 2) according to the fairly rich literature (Kaneva-Abadjieva, 1961; Parenzan, 1970; Nordsieck, 1968, 1972a, 1982; Bacescu et al., 1971; Kisseleva, 1981; Chuchcin, 1984; Grossu, 1986). Among these species only one is endemic to that sea, *Caecum glabrum tenue* Milaschewitch, 1911 (Grossu, 1986). The distribution of Mediterranean mollusc species in the Black Sea is presumably limited by the unfavorable ecological contitions (reduced salinity, low winter temperature, large amount of hydrogen sulfide, and deficiency of oxygen below 150 m depth) (Caspers, 1957; Bacescu et al., 1971).

Aegean Sea. Taking into account the valid records and the new records (19 species) added by the present study, we can estimate the number of the known Aegean prosobranch mollusc species as 420 (57% of the total Mediterranean species) (Table 1, Figure 2).

All six prosobranch orders living in the Mediterranean were found in the Aegean. Their composition, as far as the numbers of families, genera, and species are concerned is presented in Table 2. Comparing the numbers of Aegean prosobranch species in each different order with that of the whole Mediterranean, one can see that all the known Mediterranean Neritomorpha are represented in the Aegean, while only 59.7% of Neogastropoda, 57.8% of Vetigastropoda, 56.9% of Neotaenioglossa, 54.5% of Docoglossa, and 14.2% of Coculiniformia are represented. However the total number of the Mediterranean species in each order varies (e.g., there are only two neritomorph species as opposed to 388 neotaenioglossan species).

After our additions to the prosobranch fauna of the North Aegean Sea (119 species), the number of prosobranch species approaches that of the South Aegean Sea (316 versus 394 species). Species composition is also similar, permitting the characterization of the prosobranch fauna of the Aegean Sea as homogenous. The presence of some species

Table 2

Composition of the prosobranch mollusc fauna in the Aegean Sea. In each column is presented (in parentheses) the composition of the prosobranch mollusc fauna in the whole Mediterranean Sea. In the estimation, those species which are invalid or whose presence in the Mediterranean has not been confirmed, were not included

Order	Family	Genus	Species
Docoglossa	3 (4)	3 (5)	6 (11)
Cocculiniformia	1 (5)	1 (5)	1 (7)
Neritomorpha	1 (1)	2 (2)	2 (2)
Vetigastropoda	8 (8)	23 (40)	63 (109)
Neotaenioglossa	38 (51)	99 (144)	219 (388)
Neogastropoda	6 (9)	52 (74)	129 (220)
Total	57 (78)	180 (270)	420 (737)

only in the southern part of the Aegean may be attributed (i) to the different physico-chemical conditions (e.g., higher temperatures and salinities in the southern part (Pérès and Picard, 1964; Pérès, 1967; Kiortsis, 1969; etc.)) and (ii) to the more intensive research carried out in the South Aegean.

From the zoogeographical point of view, the prosobranch fauna of the Aegean Sea (Table 3) seems similar to that the Mediterranean in general. The bulk of the species are Atlanto-Mediterranean (203 species, 48.5%), followed by Mediterranean endemics (146 species, 34.9%) and Boreal (44 species, 10.5%).

Five of the Mediterranean endemic species having their type locality in the Aegean (*Gibbula spratti*, *Jujubinus karpathoensis*, *Rissoa auriformis pseudomonodonta*, *Latirus profetai*, and *Clathromangelia fehri*) have not been recorded yet from other Mediterranean areas.

Table 3

Number of Aegean and Mediterranean prosobranch molluscs in different zoogeographic categories. The terminology and the boundaries of the zoogeographic areas were defined following Fredj (1974) and Cattaneo-Vietti and Thompson (1989)

	Aegean Sea	Mediterranean Sea
Atlanto–Mediterranean	203 (48.33%)	339 (45.99%)
Boreal	44 (10.48%)	71 (9.63%)
Mediterranean endemics	146 (34.76%)	267 (36.23%)
Cosmopolitan	14 (3.33%)	19 (2.58%)
Senegalian	7 (1.67%)	13 (1.77%)
Indo–Pacific	6 (1.43%)	28 (3.80%)
Total	420	737

It is also worth mentioning that only six of the Mediterranean species of Indo-Pacific origin (Lessepsian migrants) have been found in the Aegean Sea. Only one of them (*Rapana venosa*) has been recorded from the North Aegean Sea (Koutsoubas and Voultsiadou-Koukoura, 1991), while the remaining five (*Nerita sanguinolenta, Alvania dorbignyi, Strombus decorus, Erronea caurica, Murex forskoechli*) have been recorded from the South Aegean (Settepassi, 1967,1968; Nordsieck, 1973b; Tenekidis, 1989). This demonstrates that the Lessepsian migration has not yet proceeded to the North Aegean Sea; taking into account that *Rapana venosa* has been carried to the North Aegean — and other Mediterranean regions — probably by boats (Ghisotti, 1971). The absence of Lessepsian migrants in the North Aegean Sea has also been noticed for other benthic groups (Koukouras et al., 1992; Koutsoubas and Koukouras, 1993; Vafidis et al., 1994).

The results of the present study, combined with the data from the relevant literature, show that the number of prosobranch species in the Aegean is higher than in any other Mediterranean area except of the Western basin, which is the richest area in species number (Fig. 2). The comparatively high number of species found in the latter may be attributed to the fact that it has been better studied than the eastern basin and other areas (Pérès, 1967), and to its continuous enrichment with species entering from the Atlantic Ocean through Gibraltar. There are even families (e.g., Xenophoridae, Volutidae, and Terebridae) occurring in the Western Mediterranean that are unknown in the east (Barash and Danin, 1982a).

The differences between the prosobranch fauna of the Aegean and those of the other Mediterranean areas, excluding the western basin, may be attributed to the different physicochemical conditions rather than to the varying degree of research carried out in each area. The Aegean prosobranch fauna seems to be richer than those of the Adriatic, the Central Mediterranean, and the Levantine basin (Fig. 2). The same is true for other animal groups such as opisthobranchs (Koutsoubas and Koukouras, 1993), decapod crustaceans (Koukouras et al., 1992), octocoralls (Vafidis et al., 1994), and amphipods (Stefanidou and Voultsiadou-Koukoura, 1995). The claim that the Eastern Mediterranean is an impoverished area (Tortonese, 1951; Ekman, 1967; Pérès, 1967) does not apply to the Aegean as it does to the Levantine basin (Por and Dimentman, 1989) which is comparatively better studied. The Aegean should be considered as a rather prosobranch-rich Mediterranean area. This claim is expected to be strengthened by further research in specific biotopes not studied yet (coralligenous bottoms, submarine caves, deep basins, etc.).

REFERENCES

Aartsen, J.J. van. 1977. Revision of the East Atlantic and Mediterranean Caecidae. Basteria 41: 7–19.

Aartsen, J.J. van. 1982a. Synoptic Tables of Mediterranean and European Conchology. Tav. 18. Gen. *Alvania*, Subg. *Alvania*. Conchiglia 14: 4–5.

Aartsen, J.J. van. 1982b. Synoptic Tables of Mediterranean and European Conchology. Tav. 20. Gen. Alvania, Subg. *Alvinia* and *Galeodina*. Conchiglia 14: 8–9.

Aartsen, J.J. van. 1988a. Nomenclatural notes. 7. Forbes' Aegean Turridae. Bollettino Malacologico 24: 141–144.

Aartsen, J.J. van. 1988b. European Mollusca: Notes on less well-known species. 12. *Bela menkhorsti* nom. nov. = *Pleurotoma nana* Scacchi, 1836 not Deshayes, 1835 and *Fehria* (nov. gen.) *zenetouae* nov. spec. Conchiglia 20: 30–31.

Aartsen, J.J. van. 1993. Crete: Note on littoral mollusca. Conchiglia 25: 6–8.

Aartsen, J.J. van and Fehr-De Wal, M.C. 1978. The Sub-family Mangeliinae Fischer, 1887 in the Mediterranean. Conchiglie 14: 97–110.

Aartsen, J.J. van and Menkhorst, H.P.M.G. 1988. European marine Mollusca: Notes on less well-known species. 12. *Alvania gittenbergeri* spec. nov. (Gastropoda: Rissoidae) from the Mediterranean. Basteria 52: 101–104.

Aartsen, J.J. van and Zenetos, A. 1987. The genus *Clathromangelia* Monterosato, 1884, in the Mediterranean, with the description of *Clathromangelia fehri* n. sp. Conchiglia 19: 10–11.

Aartsen, J.J. van, Menkhorst, H.P.M.G., and Gittenberger, E. 1984. The marine Mollusca of the Bay of Algeciras, Spain, with general notes on *Mitrella*, Marginellidae and Turridae. Basteria Suppl. 2: 1–135.

Amati, B., Oliverio, M., and Nofroni, I. 1988. *Alvania gittenbergeri* Aartsen and Menkhorst, 1988, junior synonym of *Alvania litoralis* Nordsieck, 1972 (Mesogastropoda: Rissoidae). Conchiglia 20: 3.

Athanassopoulos, G.D. 1917. Quelques éléments de recherches hydrobiologiques en Gréce. Bull. Stn. Hydrobiol. Mar., Gréce, 2: 1–40.

Bxcescu, M., Muller, G.I., and Gomoiu, M.T. 1971. Ecologie Marinx. Vol. IV. Ditura Academiei Republicii Socialiste România.

Ballesteros, M., Alvarez, C., Luque, A., Moreno, D., Talavera, P., and Templado, J. 1986. Contribucion al conocimiento de los gasteropodos marinos de Almeria. Iberus 6: 39–55.

Barash, A. and Danin, Z. 1972. The Indo-Pacific species of Mollusca in the Mediterranean and notes on a collection from the Suez Canal. Isr. J. Zool. 21: 301–374.

Barash, A. and Danin, Z. 1977. Additions to the Knowledge of Indo-Pacific Mollusca in the Mediterranean. Conchiglie 13: 85–116.

Barash, A. and Danin, Z. 1982a. Mediterranean Mollusca of Israel and Sinai: Composition and Distribution. Israel Journal of Zoology 31: 86–118.

Barash, A. and Danin, Z. 1982b. Contribution to the knowledge of Mollusca in the Bardawil lagoon. Bollettino Malacologico 18: 107–128.

Barash, A. and Danin, Z. 1986. Further additions to the knowledge of Indo-Pacific Mollusca in the Mediterranean Sea. Spixiana 9: 117–141.

Barash, A. and Danin, Z. 1988/89. Marine mollusca at Rhodes. Isr. J. Zool. 35: 1–74.

Barash, A. and Danin, Z. 1992. Fauna Palaestina. Mollusca I. Annotated list of Mediterranean molluscs of Israel and Sinai. The Israel Academy of Sciences and Humanities, Jerusalem.

Bellini, R. 1929. I Molluschi del Golfo di Napoli. Annu. Inst. Mus. Zool. Univ. Napoli 6: 1–87.

Belloc, G. 1948. Inventory of the fishery resources of Greek waters. Appendix B, Catalogue of the resources of Greek waters. UNRRA-FAO, 65–79.

Bisacchi, I. 1928. Ricerche Faunistiche delle Isole dell'Egeo. Molluschi marini. Archivio Zoologico Italiano 12: 369–378.

Bogi, C., Coppini, M., and Margelli, A. 1979. Molluscan fauna of the central Tyrrhenian Sea. Fam. Turridae: Part I. Conchiglia 11: 6–8, 18.

Bogi, C., Coppini, M., and Margelli, A. 1980a. Molluscan fauna of the central Tyrrhenian Sea. Fam. Turridae: Part II. Conchiglia 12: 15–17.

Bogi, C., Coppini, M., and Margelli, A. 1980b. Molluscan fauna of the central Tyrrhenian Sea. Fam. Turridae: Part III. Conchiglia 12: 18–19.

Bogi, C., Coppini, M., and Margelli, A. 1980c. Molluscan fauna of the central Tyrrhenian Sea. Fam. Turridae: Part IV. Conchiglia 12: 14–15.

Bogi, C. and Nofroni, I. 1986. Su alcuni micromolluschi mediterranei rari o poco noti (Contributo I). Bollettino Malacologico 22: 153–160.

Bouchet, P. 1984. Les Triphoridae de Mediterranee et du proche Atlantique (Mollusca, Gastropoda). Lavori S.I.M., 21: 5–58.

Bouchet, P. and Guillemot, H. 1978. The *Triphora perversa* complex in Western Europe. J. Mollusc. Stud. 44: 344–356.

Bouchet, P. and Taviani, M. 1989. Atlantic deep sea Gastropods in the Mediterranean: new finding. Boll. Malacol. 25: 137–148.

Bouchet, P. and Waren, A. 1980. Revision of the North East Atlantic bathyal and abyssal Turridae (Mollusca, Gastropoda). J. Mollusc. Stud., Suppl. 8: 1–119.

Bouchet, P. and Waren, A. 1985. Revision of the North East Atlantic Bathyal and Abyssal Neogastropoda excluding Turridae (Mollusca, Gastropoda). Boll. Malacol., Suppl. 1: 123–294.

Bouchet, P. and Waren, A. 1986. Revision of the North East Atlantic bathyal and abyssal Aclididae, Eulimidae, Epitoniidae (Mollusca, Gastropoda). Boll. Malacol., Suppl. 2: 300–570.

Bruschi, A., Ceppodomo, I., Galli, C., and Piani, P. 1985. Catalogo dei Molluschi conchiferi viventi nel Mediterraneo. ENEA C.R.E.A. La Spezia, Italy.

Bucquoy, E., Dautzenberg, P., and Dolfus, G. 1882–1886. Les Mollusques marins de Roussillon. J.B. Bailliere & Fils, Paris. 1: 1–570.

Cachia, C. 1981. Notes on uncommon species of Molluscs from the Maltese Islands. Boll. Malacol. 17: 291–294.

Carus, J.V. 1893. Prodromus Faunae Mediterraneae. Vol. II. Brachystomata, Mollusca, Tunicata. Schweizerbart'sche Verlagshandlung, Stuttgart, 854 pp.

Caspers, H. 1957. Black Sea and Sea of Azov. Mar. Ecol. Geological Society of America Memoir 67: 801–890.

Caspers, H. 1968. La macrofaune benthique du Bosphore et les problèmes de l'infiltration des élements méditerranéens dans la mer Noir. Rapports de la Commision Internationale pour l'exploration Scientifique de la Mer Mediterranée, Monaco 19: 107–115.

Cattaneo-Vietti, R. and Thompson, T.E. 1989. Mediterranean Opisthobranch Molluscs: a zoogeographic approach. Boll. Malacol. 25: 183–204.

Chintiroglou, CH., 1987. Bionomy of the Sea Anemones (Actiniaria, Anthozoa) in Thermaikos Gulf (N. Aegean Sea). PhD Thesis, Aristotelian University, Thessaloniki. (in Greek).

Christiaens, J. 1973. Revision du genre *Patella* (Mollusca, Gastropoda). Bull. Mus. Natl. Hist. Nat., Paris, Sér. 3, 121: 1305–1392.

Chuchcin, V.D. 1984. Ecology of the gastropod molluscs of the Black Sea. Academy of Science USSR, Kiev. (In Russian).

Coen, G.S. 1914. Contributo allo studio della fauna malacologica dell'Adriatico. Rapporto Comitato Talassografico Italiano, 46: 1–34.

Costa, O.G. 1829. Catalogo sistematico e ragionato de Testacei delle due Sicilie. Tipografia Minerva, Naples.

Cossignani, T., Di Nisio, A., and Passamonti, M. 1992. Atlante delle conchiglie del Medio Adriatico. L'Informatore Piceno, Ancona.

Cretella, M. 1992. A review of the living species of the genus *Jujubinus* Monterosato, 1884

(Gastropoda: Trochidae). Conchiglia 23: 14–23.
D'Angelo, G. and Gargiullo, S. 1978. Guida alle conchiglie Mediterranee. Gruppo Edittore Fabri, Milan.
Dautzenberg, P. 1883. Liste de coquilles du Golfe de Gabès. J. Conchyliol. 31: 289–330.
Demetropoulos, A. 1969. Marine molluscs of Cyprus. Part A. Fish. Bull. 2: 3–15.
Demetropoulos, A. 1971. Marine molluscs of Cyprus. Part B. Fish. Bull. 3: 3–24.
Demetropoulos, A. and Hadjichristophorou, M. 1976. Some additions to the knowledge of the malacofauna of Cyprus. Fish. Bull. 4: 75–82.
Demir, M. 1952–54. The invertebrate benthos of the Bosporus and of the litoral of the sea of Marmara closer to the Bosporus. Hidrobiologi Arastirma Enstitüsü Yayinlarindan, Istanbul. (In Turkish).
Deshayes, M. 1835. Expédition scientifique de Morée. 3. Mollusques. Section Science Physique, Paris.
Dimitrakis, K. 1987. Sea shells of the Greek Seas. Orfanidis, Athens.
Di Geronimo, I. and Panetta, P. 1973. La malacofauna batiale del Golfo di Taranto. Conchiglie 9: 69–122.
Dounas, C. 1986. Study of the macrobenthic assemblages of the soft substratum in Strymonikos Gulf (N. Aegean Sea). Ph. D Thesis, Aristotelian University, Thessaloniki, Greece. (in Greek).
Ekman, S. 1967. Zoogeography of the Sea. Sidwick and Jackson, London.
Fielding, D.C. and Edmunds, J. 1973. On some gastropods of the Aegean. J. Conchol. 28: 133–140.
Fischer, P. 1877. Diagnoses molluscorum in stratis fossiliferis insulae Rhodi jacentium. J. Conchyliol. 25: 78–81.
Forbes, E. 1844. Report on the Mollusca and Radiata of the Aegean Sea, and on their distribution, considering as bearing on geology. Report of the 13th meeting of the British Association for the Advancement of Science, London, 13: 130–193.
Franchini, D. 1974. Guide to Mediterranean Conchology. Familia Cymatiidae. Conchiglia 6: 3–8.
Frank, A. 1985. Beiträge zur marinen fauna Nordgriechischer Küsten: Die mollusken des litorals bei Ouranoupolis (Chalkidike: Agio Oros) und der Insel Ammouliani. Inform. Soc. Belge Malacol. 13: 3–44.
Fredj, G. 1974. Stockage et exploitation des donées en écologie marine. Considérations biogeographiques sur le peuplement benthique de la Mediterranée. Mém. Inst. Océanograph. Monaco, 1: 1–88.
Fretter, V. and Graham, A. 1976. The Prosobranch Molluscs of Britain and Denmark. Part 1. Pleurotomariacea, Fissurellacea and Patellacea. J. Mollusc. Stud. Suppl. 1: 1–37.
Fretter, V. and Graham, A. 1978. The Prosobranch Molluscs of Britain and Denmark. Part 4. Marine Rissoacea. J. Mollusc. Stud., Suppl. 6: 153–241.
Fretter, V. and Graham, A. 1980. The Prosobranch Molluscs of Britain and Denmark. Part 5. Marine Littorinacea. J. Mollusc. Stud., Suppl. 7: 243–284.
Gamulin-Brida, H. 1967. The benthic fauna of the Adriatic Sea. Oceanogr. Mar. Biol. Annu. Rev. 5: 535–568.
Geldiay, R. and Kocatas, A. 1972. Note preliminaire sur les peuplements benthiques du Golfe d'Izmir. Scientific Monographs of the Faculty of Science, Ege University 12: 3–34.
Ghisotti, F. 1968/1978. Schede Malacologiche del Mediterraneo. Societa Italiana di Malacologia, Milano.
Ghisotti, F. 1971. *Rapana thomasiana* Grosse, 1861 (Gastropoda, Muricidae) nel Mar Nero. Conchiglie 7: 55–58.

Ghisotti, F. 1972. Le conchiglie del Golfo di Gabes. Conchiglie 8: 63–89, 101–113, 133–144.
Ghisotti, F. and Melone, G.C. 1969. Catalogo illustrato delle conchiglie marine del Mediterraneo. Superfamilia Pleurotomariacea. Conchiglie 5: 11–28.
Ghisotti, F. and Melone, G.C. 1970. Catalogo illustrato delle conchiglie marine del Mediterraneo. Superfamilia Patellacea. Conchiglie 6: 29–46.
Ghisotti, F. and Melone, G.C. 1971. Catalogo illustrato delle conchiglie marine del Mediterraneo. Superfamilia Trochacea, Familia Trochidae, Subfamilia Margaritinae, Calliostomatinae. Conchiglie 7: 52–76.
Ghisotti, F. and Melone, G.C. 1972. Catalogo illustrato delle conchiglie marine del Mediterraneo. Superfamilia Trochacea, Familia Trochidae, Subfamilia Gibbulinae. Conchiglie 8: 79–145.
Ghisotti, F. and Melone, G.C. 1975. Catalogo illustrato delle conchiglie marine del Mediterraneo. Superfamilia Trochacea, Familia Trochidae, Subfamilia Monodontinae,Trochinae. Conchiglie 8: 79–145.
Gofas, S. 1982. The genus *Tricolia* in the Eastern Atlantic and the Mediterranean. J. Mollusc. Stud. 48: 182–213.
Gofas, S. 1992. Le genre *Granulina* (Marginellidae) en Mediterranée et dans l'Atlantique Oriental. Boll. Malacol., 28: 1–26.
Grecchi, G. 1984. Molluschi planctonici e bentonici in sedimenti sapropelitici del Quaternario della Dorsale Mediterraneo. Boll. Malacol., 20: 1–34.
Grossu, A. 1986. Gastropoda Romaniae. Caractere generale, istoricul si biologia gastropodelor. Subclasa Prosobranchia si Opisthobranchia. Editura Litera, Bucharest. (In Romanian).
Gruvel, A. and Moazzo, G. 1931. Contribution a la Faune Malacologique marine des côtes Libano-Syriens. In: Gruvel, A., ed. Les Etats de Syrie: Richesses marines et fluviales. Exploitation actuelle. Avenir. Paris, Societé d'Editions Geographiques, Maritimes et Coloniales: 437–453.
Guidastri, R., Melone, G., and Taviani, M. 1984. Systematic position of "*Trochus*" *wiseri* calcara (Prosobranchia: Trochidae). Arch. Mollusk. 114: 125–136.
Haas, G. 1937. Mollusca Marina. In: Bodenheimer F.S., ed. Prodromus Faunae Palestinae. Mém. Inst. Egypte, Cairo 33: 275–280.
Haas, G. 1951. Preliminary report on the Molluscs of the Palestine coastal shelf. Bull. Sea Fish. Res. Stn. Haifa, 1: 1–20.
Hidalgo, J.C. 1870. Molluscos marinos de Espana, Portugal y las Baleares. Tomo II. Parte descriptiva. Miguel Ginesta, Madrid.
Hoenselaar, H.J. and Hoenselaar, J. 1989. On the distribution of *Ersilia mediterranea* (Monterosato, 1869), in the Western Mediterranean Basin. Boll. Malacol., 25: 255–256.
Hopkins, T.S. 1978. Physical process in the Mediterranean Basins. In: Kjefue B., ed. Estuarine Transport Processes. University of South Carolina Press, Columbia, pp. 269–310.
Huvé, P. 1957. Contribution preliminaire a l'étude des peuplements superficiels des côtes rocheuses Méditerranée Orientale. Recl. Trav. Stn. Mar. Endoume 12: 50–66.
Jacquotte, R. 1962. Etude des fonds de Maërl de Mediterranée. Recl. Trav. Stn. Mar. Endoume 26: 141–235.
Janssen, R. 1989. Benthos-Mollusken aus dem Tiefwasser des östlichen Mittelmeeres, gesammelt während der "Meteor"-Fahrt 5 (1987). Senckenbergiana Marit., 20: 207–221.
Jeffreys, J.G. 1883a. Mediterranean Mollusca, No 3, and other Invertebrata. Ann. Magazine Nat. Hist., ser. 5, 11: 393–401.
Jeffreys, J.G. 1883b. Mediterranean Mollusca. Ann. Magazine Nat. Hist., ser. 5, 12: 67–86.
Kaneva-Abadjieva, V. 1959. La Faune des Mollusques de la Région du Bosphore. C.R. Acad.

Bulg. Sci. 12: 439–442.
Kaneva-Abadjieva, V. 1961. Répartition des Mollusques de la Mer Noire dans les eaux littorales Bulgares. C.R. Acad. Bulg. Sci. 13: 149–172.
Kiortsis, V. 1969. Marine Fauna of the Aegean Sea. Surface zooplankton from the North Aegean Sea. Final Report for the Office of Naval Research. Oceanic Biology Branch.
Kisseleva, M. 1963. La distribution du benthos quantitative et qualitative dans la Mer Egée. Trav. Sevastopol Biologie Stn. 16: 192–200.
Kisseleva, M. 1981. Benthos of the soft substrate in the Black Sea. Academy of Science, USSR, Kiev. (In Russian).
Koroneos, J. 1979. Les Mollusques de la Gréce. Papadakis Press, Athens.
Koukouras, A., Voultsiadou-Koukoura, H., Chintiroglou, H., and Dounas, C. 1985. Benthic bionomy of the North Aegean Sea. III. A comparison of the macrobenthic animal assemblages associated with seven sponge species. Cah. Biol. Mar. 26: 301–319.
Koukouras, A., Dounas, C., Türkay, M., and Voultsiadou-Koukoura, H. 1992. Decapod Crustacean Fauna of the Aegean Sea: New Information, Checklist, Affinities. Senckenbergiana Marit. 22: 217–244.
Koutsoubas, D. and Voultsiadou-Koukoura, H. 1991. The occurrence of *Rapana venosa* (Valenciennes, 1846) (Gastropoda, Thaididae) in the Aegean Sea. Boll. Malacol., 26: 201–204.
Koutsoubas, D., Koukouras, A., Karakasis, I., and Dounas, C. 1992. Contribution to the knowledge of Gastropoda and Bivalvia (Mollusca) of Crete island (S. Aegean Sea). Boll. Malacol., 28: 69–82.
Koutsoubas, D. and Koukouras, A. 1993. An account of our knowledge on the Opisthobranch Mollusc Fauna of the Aegean Sea. Boll. Malacol. 29: 191–200.
Lacombe, H., Tchernia, P., and Benoist, G. 1958. Contribution a l'étude hydrologique de la Mer Egée en periode d'été. Bull. Info. Comite Central d'Oceanogr. 10: 454–468.
Ledoyer, M. 1966. Ecologie de la faune vagile des biotopes Mèditerraneens accessibles en scaphandre autonome. Recl. Trav. Stn. Mar. Endoume 41: 135–164.
Ledoyer, M. 1969. Aperçu sur la faune vagile de quelques biotopes de substrat dur de Méditerranée Orientale comparaison avec les mêmes biotopes en Méditerranée Occidentale. Tethys 1: 281–290.
Luque, A.A. 1986. Contribucion al conocimiento de los gasteropodos marinos de las costas de Malaga y Granada. II. Prosobranquios. Iberus 6: 79–94.
Marion, A.F. 1898. Notes sur la fauna des Dardanelles et du Bosphore. Ann. Mus. Hist. Nat., Marseilles, 2: 163–181.
Micallef, H. and Evans, F. 1968. The marine fauna of Malta. Marine Science Royal University, Malta, 1: 143–172.
Mienis, H.K. 1981. New or little known molluscs from the Eastern Mediterranean. Levantina 32: 387–388.
Misfud, C. 1992. Molluschi di Malta. Conchiglia 24 (265): 4–10.
Misfud, C. 1993. Two new gastropod species from Malta. Conchiglia 25 (266): 14–17, 28.
Monterosato, T.A. 1877a. Notizie sulle conchiglie delle rada di Civitavecchia. Ann. Mus. Civ. Genova 9: 407–428.
Monterosato, T.A. 1877b. Note sur quelques coquilles provenant des côtes d'Algerie. J. Conchyliol. 25: 24–49.
Monterosato, T.A. 1890. Conchiglie delle profondita del mare di Palermo. Naturalist. Siciliana 9: 140–166, 181–191.

Monterosato, T.A. 1892. Monografia dei Vermeti del Mediterraneo. Boll. Soc. Malacol. Italiana 17: 7–48.

Monterosato, T.A. 1917. Molluschi viventi e quaternarii raccolti lungo le coste della Tripolitania dall'ing. "Camillo Crema". Boll. Soc. Zool. Italiana 3: 1–27.

Murdoch, W.W. and Onuf, C.P. 1974. The Mediterranean as a system. Part I. Large Ecosystems. International Journal of environmental Studies 5: 275–284.

Nicolay, K. 1986. Non-stop spreading of the Mediterranean *Strombus*. Conchiglia 18 (202–203): 28.

Nicolay, K. and Angioy, M. 1988. Synoptic Tables of Mediterranean and European Conchology. Fam. Littorinidae Gray, 1840. Part I. Conchiglia 20 (226–227): 28–29.

Nofroni, I. 1982a. Appunti malacologici di un breve viaggio in Grecia. Notizario CISMA, 4: 41–46.

Nofroni, I. 1982b. *Fusinus profetai* new species from the Mediterranean. Conchiglia 14 (154–155): 8–9.

Nofroni, I. 1986. Synoptic Tables of Mediterranean and European Conchology. Table 31. Fam. Nassariidae Iredale, 1916. Part I. Conchiglia 18 (208–209): 20–21.

Nofroni, I. 1987. Synoptic Tables of Mediterranean and European Conchology. Table 35. Fam. Nassariidae Iredale, 1916. Part V. Conchiglia 19 (220–221): 13.

Nordsieck, F.1968. Die europäischen Meeres-Gehäuseschnecken (Prosobranchia) von Eismeer bis Kapverden und Mittelmeer. Gustav Fischer Verlag, Stuttgart.

Nordsieck, F. 1971. Kontinentale und abyssiche Meeresmollusken des Jonischen Meeres. Arch. Mollusk. 101: 187–190.

Nordsieck, F. 1972a. Die europäischen Meereschnecken (Opisthobranchia mit Pyramidellidae, Rissoacae) von Eismeer bis Kapverden, Mittelmeer und Schwarzes Meer. Gustav Fischer Verlag, Stuttgart.

Nordsieck, F. 1972b. Marine Gastropoden aus der Shiqmona Bucht in Israel. Arch. Mollusk. 102: 227–245.

Nordsieck, F. 1973a. The genus *Jujubinus* Monterosato, 1884 in Europa. Conchiglia 5 (50): 6–7, 10–13.

Nordsieck, F. 1973b. New finds in the Mediterranean. *Neritina Kinzelbalchi*. Conchiglia 5 (53–54): 4.

Nordsieck, F. 1973c. Marine shells from the Mediterranean coast of Israel. Argamon, Israel J. Malacol. 4: 57–63.

Nordsieck, F. 1973d. The genus *Tricolia Risso*, 1826 in the European Seas. Conchiglia 5 (55–56): 3–10.

Nordsieck, F. 1973e. Abyssal molluscs from the Ionic Sea. Conchiglia 5 (57–58): 4–7.

Nordsieck, F. 1976a. The genus *Cerithiopsis* Forbes and Hanley, 1849 in the European seas. Conchiglia 8 (85–86): 6–7, 18.

Nordsieck, F. 1976b. The genus *Chauvetia* Monterosato, 1884 in the European seas. Conchiglia 8 (89–90): 3–7.

Nordsieck, F. 1976 c. The genus *Bittium* Leach, 1847 in the European seas. Conchiglia 8 (93–94): 6–9.

Nordsieck, F. 1977a. Edward Forbes (1814–1854) redividus: Revision der Gastropoden einer Agais–Expedition von 1841–1842. Ann. Mus. Goulandris, 3: 131–172.

Nordsieck, F. 1977b. The Turridae of the European Seas. La Piramide per Conchiglia, Rome.

Nordsieck, F. 1982. Die europäischen Meeres-Gehäuseschnecken (Prosobranchia) von Eismeer bis Kapverden, Mittelmeer und Schwarzes Meer. Gustav Fischer Verlag, Stuttgart.

Nordsieck, F. and Garcia-Talavera, F. 1979. Moluscos marinos de Canarias y Madera. Aula de

Cultura de Tenerife.
Odhner, N.H. 1914. Beitrage zur kenntnis der marinen Molluskenfauna von Rovigno in Istrien. Zool. Anzee 44: 156–170.
Oberling, J.J. 1960–62. Une collection de microgastéropodes marins d'Attique. Jahrb. Naturhist. Mus. Stadt Bern, 1: 207–221.
Oberling, J.J. 1969–71. On the littoral Mollusca of the Sea of Marmara. Jahrbuch Naturhistorischen Museumes, Bern, 4: 183–218.
Oliverio, M. 1986. *Alvania amatii* n. sp. (Gastropoda: Prosobranchia). Notizario CISMA, 8: 29–34.
Oliverio, M., Amati, B., and Nofroni, I. 1986. Proposta di Adeguamento Sistematico dei Rissoacea (sensu Ponder) del mar Mediterraneo. Part I: Familia Rissoidae Gray, 1847 (Gastropoda: Prosobranchia). Notizario CISMA, 8: 35–52.
Oliverio, M. and Amati, B. 1990. Una nuova specie del gruppo di *Alvania subcrenulata* (Gastropoda; Rissoidae). Boll. Malacol. 26: 83–90.
Oriolo, G. 1971. Conchiglie dello Jonio. Conchiglie 6: 107–118.
Ostroumoff, A. 1896. Comptes rendus des dragages et du plancton de l'expedition de Selianik. Bulletin Academy Science, Saint-Pétersbourg, 5: 33–92. (In Russian).
Paget, O.E. 1976. Die Molluskenfauna der Insel Rhodos. Ann. Naturhist. Mus. Wien 80: 681–780.
Pallary, P. 1904. Addition à la faune malacologique du Golfe de Gabés. J. Conchyliol. 52: 212–248.
Pallary, P. 1906. Addition a la faune malacologique du Golfe de Gabés. (2me article). J. Conchyliol. 54: 77–124.
Pallary, P. 1912. Catalogue des Mollusques du littoral Mediterranée de l'Egypte. Mem. Inst. Egypte, 7: 69 –205.
Pallary, P. 1917. Mollusques marins des Dardanelles colligés par M. Claude Bravard. J. Conchyliol. 63: 142–147.
Pallary, P. 1938. Les Mollusques marins de la Syrie. J. Conchyliol. 82: 5–58.
Panagiotopoulos, P. 1916. Report of the Hydrobiological Station. Ministry of Economy, Athens, 559–586.
Panetta, P. 1977. I Molluschi del Mar Grando di Tarranto. Quad. Laboratorio Tecnologico e di Pesca, 3, Suppl.: 577–586.
Panetta, P. 1980. La familia Caecidae nel Mediterraneo. Boll. Malacol. 16: 277–300.
Parenzan, P. 1969. Il sedimento conchilifero del Jonio seno del Mar Piccolo di Taranto. Thalassia Salentina 3: 66–106.
Parenzan, P. 1970. Carta d'identita delle conchiglie del Mediterraneo. Vol. I. Gasteropodi. Ed. Bios Taras, Taranto, 283 pp.
Parenzan, P. 1977. Malacologia del Mar Piccolo di Taranto. Conchiglie 13: 121–132.
Pasteur-Humbert, C. 1962. Les Mollusques Marins Testacés du Maroc. I. Les Gasteropodes. Trav. Inst. Sci. Chérifien, Sèr. Zool. 22: 1–224.
Pérès, J.M. 1967. The Mediterranean benthos. Océanograph. Mar. Biol. Ann. Rev. 5: 449–533.
Pérès, J.M. and J. Picard 1958. Recherches sur les peuplements benthiques de la Méditerranée nord-orientale. Ann. Inst. Océanogr.: Résultats Scientifiques des Campagnes Calypso, 34: 213–291.
Pérès, J.M. and Picard, J. 1964. Nouveaux manuel de bionomie benthique de la Méditerranée. Recl. Trav. Stn. Mar. Endoume 31: 1–137.
Philippi, P. 1836. Enumeratio molluscorum Siciliae cum viventium tum in tellure testiaria fossilium quae in itinere suo observavit. (I). Berlin, 267 pp.
Philippi, P. 1844. Enumeratio molluscorum Siciliae cum viventium tum in tellure testiaria

fossilium quae in itinere suo observavit. (II). Berlin, 303 pp.
Piani, P. 1980. Catalogo dei molluschi conchiferi viventi nel Mediterraneo. Boll. Malacol. 16: 113–224.
Piani, P. 1984. Revisione del genere *Emarginula* Lamarck, 1801 in Mediterraneo. Lavori, S.I.M., 21: 193–238.
Pope, G.T. and Goto, Y. 1991. European Seashells. Vol. I. Polyplacophora, Caudofoveata, Solenogastra, Gastropoda. Verlag Christa Hemmen, Wiesbaden, 352 pp.
Por, F.D. 1978. Lessepsian Migration. The influx of Red Sea Biota into the Mediterranean by way of the Suez Canal. Springer Verlag, Berlin, 228 pp.
Por, F.D. and Dimentman, C. 1989. The legacy of Tethys: an aquatic biogeography of the Levant. Kluwer Academic Publ., Dordecht, 214 pp.
Radoman, P. 1974. Some new gastropod representatives from the brackish waters of the Adriatic and Aegean seasides. Veliger, 16: 283–288.
Richards, G.W. 1983. Molluscan zonation on rocky shores in Malta. J. Conchol. 31: 207–224.
Riedl, R. 1963. Fauna und Flora der Adria. Verlag Paul Parey, Berlin.
Sabelli, B. 1972. Alcune osservazioni su *Pseudosimnia carnea* e *Pseudosimnia adriatica.* Conchiglie 8: 57–63.
Sabelli, B., Giannuzzi-Savelli, R., and Bedulli, D. 1990. Catalogo annotato dei Molluschi Marini del Mediterraneo. Vol. 1. Libreria Naturalistica Bolognese, Bologna.
Sabelli, B. and Spada, G. 1980. Guida illustrata all'identificazione delle conchiglie del Mediterraneo. Fam. Coralliophilidae. Gen. *Coralliophila*, *Latiaxis*, *Coralliobia*. Boll. Malacol. 16, Suppl.: 3 pp.
Sabelli, B. and Spada, G. 1981. Guida illustrata all'identificazione delle conchiglie del Mediterraneo. Fam. Columbellidae. II. Gen. *Pyrene*, *Columbellopsis*. Boll. Malacol. 17, Suppl.: 3 pp.
Sabelli, B. and Spada, G. 1985. Guida illustrata all'identificazione delle conchiglie del Mediterraneo. Buccinidae. II. Gen. *Buccinum*, *Neptunea*, *Colus.* Boll. Malacol. 21, Suppl.: 3 pp.
Sabelli, B. and Spada, G. 1986. Guida illustrata all'identificazione delle conchiglie del Mediterraneo. Fam. Buccinidae. III. Gen *Buccinum, Cantharus, Engina, Pisania.* Fam. Collumbellidae. I. Gen. *Collumbella, Amphisca, Anachis, Mazantlania*. Boll. Malacol. 22, Suppl.: 4 pp.
Sakellariou, E. 1957. Les mollusques vivants du Golfe de Thessaloniki et leurs contribution a la stratigraphie. Ann. Géol. Pays Hell. 8: 135–221.
Schiro, G. 1977. Naticidae (moon shells) of the Mediterranean. Part II. Conchiglia 9 (104–105): 16–17.
Settepassi, F. 1967. Atlante Malacologico dei Molluschi Marini viventi nel Mediterraneo.Vol. I. Corporazione Atti Grafiche, Roma.
Settepassi, F. 1968. A proposito della *Cypraea caurica* e del *Conus mediterraneus ater.* Conchiglie 4: 43.
Settepassi, F. 1971. Atlante Malacologico dei Molluschi Marini viventi nel Mediterraneo.Vol. II. Corporazione Atti Grafiche, Roma.
Spada, G. 1971. Ritrovamenti malacologici nelle aque di Beirut (Libano). Conchiglie 7: 85–93.
Spada, G., Sabelli, B., and Morandi, V. 1973. Contributo alla conoscenza della malacofauna marina dell'isola di Lampedusa. Conchiglie 9: 29–67.
Stefanidou, D. and Voultsiadou-Koukoura, H. 1995. An account of our knowledge on the amphipod fauna of the Aegean Sea. Crustaceana 65: 597–615.

Steindachner, F. 1891. Veröffentlichungen der Commission für Erforschung des östlichen Mittelmeeres. Sitz. der Akademie Wissenschaften naturw. — mathem., Wien, 1: 435–443.

Steuer, A. 1939. Die Fischereigründe von Alexandrien: XIX, Mollusca. Thalassia, 3: 1–143.

Stjepcevic, J., Parenzan, P., Mandic, S., and Dragovic, R. 1982. Survey on benthic Mollusca population on the inner part of Boka Kotorska Bay. Studia Marina, Kotor 11/12: 3–27.

Sturany, R. 1896. Zoologische Ergebnisse. VII. Mollusken I (Prosobranchier und Opisthobranchier, Scaphopoden, Lamellibranchier) gesammelt von S.M. Schiff "Pola" 1890–1894. Denkschriften der Akademie Wissenschaften mathem. — naturw., Wien 63: 1–36.

Templado, J. 1982. Contribucion al conocimiento de los Gasteropodos marinos de Mallorca. Iberus 2: 71–77.

Templado, J. 1984. Moluscos de las praderas de *Posidonia oceanica* en las costas del Cabo de Palos (Murcia). Investigation Pesquera 48: 509–516.

Templado, J. 1986. Datos sobre los Triphoridae litorales de las costas Mediterraneas espanolas (Prosobranchia, Heteroglossa). Iberus 6: 209–213.

Tenekidis, N. 1989. A collection of shells from the Greek Seas. Protopapa Press, Athens, 187 pp.

Terreni, G. 1981. Molluschi conchiferi del mare antistante la costa Toscana. Museo di Storia Naturalle della Provincia di Livorno.

Theocharis, A., Georgopoulos, D., Laskaratos, A., and Nittis, K. 1993. Water masses and circulation in the central region of the Eastern Mediterranean: Eastern Ionian, South Aegean and Northwest Levantine, 1986–1987. Deep-Sea Research 40: 1121–1142.

Tiganus, V. 1984. Contributions a la connaissance de la faune associée aux macrophytes de la côte Libyenne de la Mediterranée. Travaux Musee Histoire naturelle "Grigore Antipa", Bucurest, 26: 61–68.

Torelli, A. 1982. Guide per il riconoscimento delle specie animali delle aque lagunari e costiere italiane. 8. Gasteropodi conchigliati. C.N.R., AQ/1/96, Genova.

Tornaritis, G. 1987. Mollusca of the Mediterranean Sea. Cyprus. Proodos Printing and Publishing Co. Ltd., Nicosia.

Tortonese, E. 1947. Biological investigations in the Aegean Sea. Nature 159: 887–888.

Tortonese, E. 1951. I caratteri biologici del Mediterraneo Orientale e i problemi relativi. Attuali zoologici 7: 207–251.

Vafidis, D., Koukouras A., and Voultsiadou-Koukoura, E. 1994 Octocoral fauna of the Aegean Sea with a checklist of the Mediterranean species: New information, faunal comparisons. Ann. Inst. Océanogr., Paris, 70: 217–229.

Vatova, A. 1949. La fauna bentonica dell'Alto e Medio Adriatico. Nova Thalassia 1: 1–110.

Vatova, A. 1974. Sui Molluschi di alcuni saggi di fondo prelevati alle soglie del Mar Jonio. Conchiglie 10: 93–112.

Vatova, A. 1975. Ricerche qualitative e quantitative sulla fauna bentonica del Golfo di Taranto. Boll. Pesca, Piscic. Idrobiol. 30: 1–31.

Verduin, A. 1976a. On the systematics of Recent *Rissoa* of the subgenus *Turboella* Gray, 1847, from the Mediterranean and European Atlantic coasts. Basteria 40: 21–73.

Verduin, A. 1976b. On characters, variability and distribution of the European marine gastropods *Bittium latreillii* (Payraudeau) and *Bittium lacteum* (Philippi). Basteria 40: 133–142.

Verduin, A. 1979. *Gibbula vimontiae*, a good marine gastropod species from the Mediterranean. Basteria 43: 27–31.

Verduin, A. 1982a. On taxonomy and variability of Recent European species of the genus *Bittium* Leach (Mollusca, Gastropoda, Prosobranchia). Basteria 45: 93–120.

Verduin, A. 1982b. On the taxonomy and variability of Recent European and North African

marine species of the subgenus *Rissostomia* Sars, 1878, of the genus *Rissoa* Desmarest, 1814 (Mollusca, Gastropoda, Prosobranchia). Basteria 46: 143–166.

Verduin, A. 1983. On the taxonomy of recent Mediterranean species of the subgenus *Loxostoma* of the genus *Rissoa* (Mollusca, Gastropoda, Prosobranchia). Basteria 47: 61–66.

Verduin, A. 1984. On the taxonomy of some recent European marine species of the genus *Cingula* s.I. (Gastropoda: Prosobranchia). Basteria 48: 37–87.

Verduin, A. 1985. On the taxonomy and variability of recent European and North African species of the subgenera *Apicularia* and *Goniostoma* of the genus *Rissoa* (Gastropoda, Prosobranchia). Basteria 49: 105–132.

Verduin, A. 1986a. On the systematics of some recent *Rissoa* (Gastropoda, Prosobranchia). Basteria 50: 13–24.

Verduin, A. 1986b. *Alvania cimex* (L.) s.I. (Gastropoda, Prosobranchia), an aggregate species. Basteria 50: 25–32.

Verduin, A. 1988. On the taxonomy of some Rissoacean species from Europe, Madeira and the Canary Islands (Gastropoda, Prosobranchia). Basteria 52: 9–35.

Waren, A. 1980. Marine Mollusca described by John Gwyn Jeffreys, with the location of the type material. Conchological Society of Great Britain and Ireland (Spec. Publ. 1): 1–60.

Waren, A. 1992. New and little known <<Skeneimorph>> gastropods from the Mediterranean Sea and the adjacent Atlantic Ocean. Boll. Malacol. 27: 149–248.

Wawra, E. 1974. Mitteilung über eine Aufsammlung von interstitiellen Gastropoden aus sublitoralen Sanden der Insel Lesbos (Griechenland). Ann. Naturhist. Mus. Wien, 78: 499–503.

Yaron, I. 1971. Recent additions to the Mediterranean Molluscan fauna of Israel. Argamon, J. Isr. Malacol. Soc. 2: 1–6.

Yaron, I. 1972. Further additions to the Mediterranean Molluscan fauna of Israel. Argamon, J. Isr. Malacol. Soc. 3: 33–36.

Zenetos, A. and Aartsen, J.J. van. 1994. The deep sea molluscan fauna of the S.E. Aegean Sea and its relation to the neighbouring faunas. Boll. Malacol. 30: 253–268.

Zenetos, A., Papathanassiou, E., and Aartsen, J.J. van 1991. Analysis of benthic communities in the Cyclades plateau (Aegean Sea) using ecological and paleoecological data sets. P.S.Z.N.I. Marine Ecology 12: 123–137.