

Grain size and amphipod distribution in the North Aegean Sea

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Amphipods, in spite of their important role in the benthic ecosystem, are very little studied in the Greek seas. Furthermore, several studies have implicated grain size as an important determinant of amphipod distribution (FINCHAM 1973, etc.), although other authors (e.g. ROBERTSON *et al.*, 1989) consider factors like organic carbon as more important.

The present paper deals with the relationship between the grain size and the distribution of the amphipods collected during benthic surveys in the North Aegean Sea. Samplings were made in three gulfs (Thermaikos, Strymonikos and Kavala), either using a Charcot-Picard dredge, or a Van Veen grab, in 180 stations, at depths of 0.9 to 86.4 m, in soft substrata. Certain physico-chemical parameters were measured. Particle size analysis was conducted combining dry sieving of the sand fraction and pipette analysis of the silt-clay fraction, as described by BUCHANAN (1984).

119 amphipod species were totally found in the three gulfs (71 in Thermaikos, 58 in Strymonikos and 59 in Kavala). The most widely distributed are the 18 species given in Table I. In this table, the fluctuation of the Median diameter (Md) of the sediment in which each of these species was found is presented.

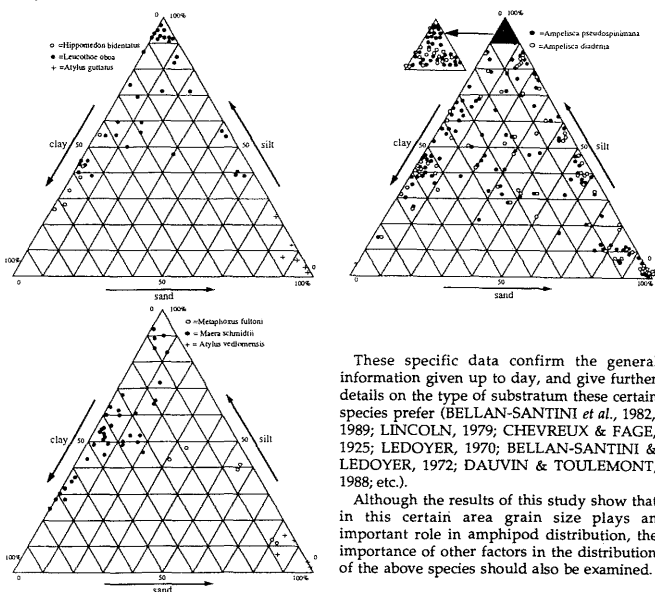
The preferences of the various species concerning the grain size of the sediment are much better illustrated in the triangular diagrams of Fig. 1. In these diagrams, the sampling stations in which each amphipod species was found, are set depending on the clay-silt-sand fractions. In the present paper, only representative diagrams are given, for 8 of the most widely distributed species in the three gulfs.

As indicated in the above diagrams, three basic groups of amphipod species are distinguished. The first group includes species that occur in almost the whole range of sediment types, according to our data. In this group the species of the genus *Ampelisca*, *A. pseudospinimana* BELLAN-SANTINI & KAIM-MALKA and *A. diadema* (A. COSTA) are included, which, however, seem to have a slight preference in silty sediments (Fig. 1). The second group comprises of species preferring substrata with relatively big grain diameter, for example the species of the genus *Atylus*, *A. guttatus* (A. COSTA) and *A. vedlomensis* (BATE & WESTWOOD) which appear in stations where the sand fraction is greater than 75%. The third group includes species showing a preference in sediments with small grain diameter (mainly silty or clay-silty), having for this reason a very limited range of distribution. Such species are *Maera schmidti* STEPHENSEN, *Leucothoe obova* KARAMAN and *Hippomedon bidentatus* CHEVREUX. Finally, *Metaphoxus fultoni* (SCOTT) seems to prefer sand-silty sediments.

Table I. Median diameter (Md) fluctuation for certain amphipod species.

	0	100	200	300	400	500	600	700	800	900	1000	1100	1200	1300	Md (µm)
<i>Ampelisca pseudospinimana</i>	—————														>4-1266
<i>Ampelisca diadema</i>	—————														>4-1266
<i>Ampelisca typica</i>	—————														>4-1266
<i>Atylus vedlomensis</i>	—————														356-1266
<i>Atylus guttatus</i>	—————														149-707
<i>Bathyporeia guilliamsoniana</i>	—————														149-427
<i>Westwoodilla rectirostris</i>	—————														5-225
<i>Perioculodes longimanus</i>	—————														>4-135
<i>Metaphoxus fultoni</i>	—————														21-129
<i>Harpinia crenulata</i>	—————														>4-82
<i>Leucothoe obova</i>	—————														>4-82
<i>Leucothoe lilljeborgi</i>	—————														4-70
<i>Leptocheirus mariae</i>	—————														>4-69
<i>Ampelisca tenuicornis</i>	—————														4-44
<i>Paraphoxus maculatus</i>	—————														>4-41
<i>Maera schmidti</i>	—————														4-33
<i>Hippomedon bidentatus</i>	—————														>4-12
<i>Harpinia dellavallei</i>	—————														>4-5

Fig. 1. Triangular diagrams showing the grain size preferences of certain species.



These specific data confirm the general information given up to day, and give further details on the type of substratum these certain species prefer (BELLAN-SANTINI *et al.*, 1982, 1989; LINCOLN, 1979; CHEVREUX & FAGE, 1925; LEDOYER, 1970; BELLAN-SANTINI & LEDOYER, 1972; DAUVIN & TOULEMONT, 1988; etc.).

Although the results of this study show that in this certain area grain size plays an important role in amphipod distribution, the importance of other factors in the distribution of the above species should also be examined.

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