COASTAL VARIABILITY OF ZOOPLANKTON BIOMASS IN THE NORTHWESTERN SECTOR OF THE ALBORAN SEA

A. GARCIA* & J.A. CAMIÑAS*
*Instituto Español de Oceanografía. Centro Costero de Fuengirola

ABSTRACT.- Zooplankton biomass values taken throughout the months of March and August 1982, and September 1983, in the northwestern sector of the Alboran Sea are analized.

RESUME.- Nous avons étudié les valeurs de la biomasse zooplanctonique enregistrée pendant les mois de Mars et Août 1982, et Septembre 1983, dans le secteur nord occidental de la mer d'Alboran.

The zooplanktonic biomass data exposed in the present paper are based on three surveys carried on in the months of March, 1982 ("Chanquete-I"), August, 1982 ("Chanquete-II") and September, 1983 ("Emisarios-I"), along the northwestern coast of the Alboran Sea.

A total of 46 samples taken for the purpose of calculating zooplankton biomass values were studied. These proceed from the stations shown in Fig. 1. Samples taken in the March and August survey, have the same situations in the sampling area, while those of the September survey have been taken in coastal submarine discharge areas or direct sewage drain areas, corresponding to Area II of Fig. 1, and in the bay of Algeciras.

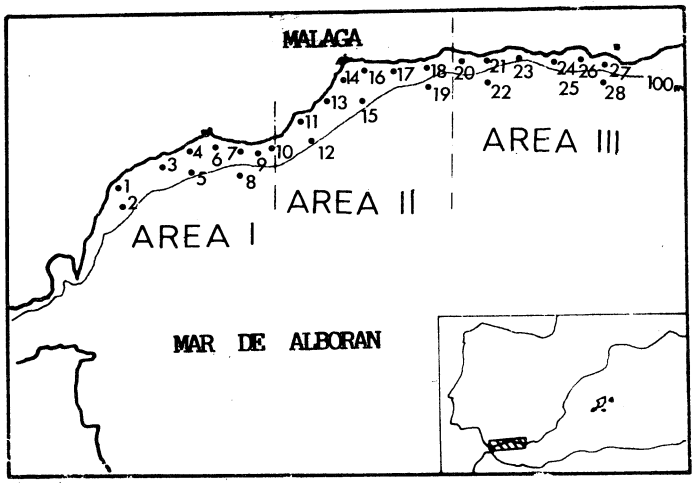

Fig. 1.- Station chart of surveys "Chanquete I & II"

Zooplankton samples were obtained from oblique tows with a Bongo plankton net of 40 Ø cms., equipped with a 250 µ mesh and a General Oceanics 2030 flowmeter. Maximum depths reached in coastal tows vary from 5-27 mts., while in the offshore stations from 25-60 mts..

Results.-

Zooplankton biomass (dry weight) and organic matter values obtained are expressed in Table I.

Depending on the hydrological characteristics of the sampling zone, it has been divided in three area:

Area I.- corresponds to an area in proximity of the Strait of Gibraltar characterized by a strong superficial Atlantic current and the existence of an intermittent upwelling.
Area II.- intermediate zone of contact of waters from Areas I and III.
Area III.- characterized by waters of a more stable mediterranean condition.

		CHANQUETE-I		CHANQUETE-II			EMISARIOS-I		
	Station	Biomass (mg/m^3)	O.matter (mg/m^3)	Biomass (mg/m^3)	O.matter (mg/m^3)		Station	Biomass (mg/m^3)	O.matter (mg/m^3)
AREA I	1	22.69	9.33	21.37	16.9		-	-	-
	2	12.05	7.38	4.78	3.42		-	-	-
	3	26.77	18.69	13.92	8.77		-	-	-
	4	-	-	41.82	31.27		-	-	-
	5	15.80	10.44	10.05	6.59		-	-	-
	6	-	-	37.17	26.63		-	-	-
	7	14.92	9.98	39.36	30.47		-	-	-
	8	24.56	15.38	8.92	5.99		-	-	-
	9	-	-	50.19	40.18		-	-	-
	10	43.31	26.59	-	-		-	-	-
AREA II	11	42.33	26.99	36.19	24.45		2	19.79	14.94
	12	18.60	14.82	10.75	7.14		4	27.07	20.46
	13	-	-	11.59	7.25		6	25.96	18.65
	14	57.79	38.61	-	-		9	28.00	20.70
	15	54.51	31.84	25.59	18.39		12	3.86	2.92
	16	15.48	9.03	-	-		13	31.17	23.80
AREA III	17	45.65	29.29	-	-	AREA II	16	16.04	11.67
	18	14.36	8.18	-	-		18	34.65	27.71
	21	24.68	15.46	-	-		21	21.84	14.81
	22	41.50	25.38	-	-		23	14.35	9.55
	25	34.39	21.99	-	-		26	16.75	12.61
	27	46.55	28.30	-	-		28	31.02	22.21
	28	29.50	17.86	-	-		Algeciras		
	-	-	-	-	-		3	16.92	12.49
	-	-	-	-	-		9	22.16	14.95

Table I.- Zooplanktonic biomass and organic matter values.

In the month of March, when the hydrology of the area is more stable and homothermic, without observing the upwelling phenomenom during the cruise, zooplankton biomass values have been generally higher in Area II than in Area I, that has registered a mean zooplankton biomass value of 26.92 mg/m^3 in coastal stations and 17.47 mg/m^3 corresponding to offshore stations, while the mean values of Areas II and III in the same month are quite homogeneous, oscillating between 35-36 mg/m^3 in coastal and offshore waters.

In August, the contrary occurrs. The presence of the summer upwelling was observed in the most western part of the sampling area, and as a consequence, there is an increase of zooplanktonic biomass in Area I with respect to Areas II and III. Mean zooplankton biomass corresponding to coastal stations in this area is 33.97 mg/m^3, while the coastal stations of surveys "Chanquete-II" and "Emisarios-I" (Area II), register 23.89 and 22.54 mg/m^3, respectively. In waters of a more oceanic character, these mean values decrease considerably (7.91 mg/m^3 in Area I and 18.17 mg/m^3 in Area II). This phenomenom can be due to a major influence of upwelling waters on coastal waters, than those nearer to the upwelling nucleus, where the registered temperatures are considerably lower.

In the bay of Algeciras, zooplankton biomass values are lower than those recorded in Area I, as a consequence of industrial and urban contamination, but similar to the values registered at other surveys carried on at the same time of the year.