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VERTICAL DISTRIBUTION OF IRON AND PHOSPHORUS IN TWO SEDIMENT CORES FROM LAKE EDKU (EGYPT)

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Lake Edku is a small Nile Delta brackish water coastal lake connected with the Mediterranean sea through a small outlet.

Two short cores in the recent sediments were taken, one of them at the vicinity of the lake - sea connection and the other in the eastern part near the drainage area.

Dried powdered samples were digested with a hot mixture of concentrated nitric and percholoric acids. The digest taken in solutions was used for the analyses of total iron, total phosphorous, calcium, magnesium, and sulfate contents.

The results showed considerable differences between the surface and deep sediments in the eastern part of the lake when compared with those near the lake-sea connection (table 1). In this latter area, the sediments are mixed with sands introduced into the lake from the sea and consequently exhibit lower amounts of pore water.

The drainage water which is loaded with considerable amounts of dissolved and particulate elements as well as organic detritus and algal flora has enriched the surface sediments with different constituents.

Calcium and magnesium are more or less uniformly distributed in the two sediment cores with slight deviations from the mean values. Magnesium is approximately two times as abundant as calcium in the sediments of the mixing area tending to decrease away from the lake-sea connection. A linear correlation between calcium and magnesium was found in the sediments of the mixing area (r = 0.99). On the contrary, magnesium showed strong correlation with total carbonates in both sediment cores (r = 0.9).

The iron and organic matter contents in the lake sediments are generally higher than those reported by Saad (1980) for the sediments of the adjacent Abu Qir bay. Consequently, the transportation of these constituents from the lake to the sea may happen.

The relative drop in phosphorous content in the deepest sediment layer was accompanied with marked increase in organic content which makes a considerable dilution of this element. Iron on the other hand, show a reversible relation with organic matter. Sulfate show no significant variations around the mean value.

According to the relative abundance in the sediments, the studied constituents can be arranged in the following order:
$Co_3 > Fe > Mg > So_4 > Ca > P$.

References :

Saad, M. A. H., El-Rayis, O. A., and El-Nady, F. E.,1980. Occurrence of some trace metals in bottom deposits from Abu Qir Bay, Egypt, V^es Journees Etud. Pollutions, pp. 550 - 560.

Table 1- Different constituents and their averages expressed in % percentages in the subsamples of Nagas core (N_1-N_7) and El-Darfil core (D_1- D_6) as well as the order of their abundance.

Sample	depth cm	H_2O%	org-subs	Ca %	Mg	Fe	P	SO_4	Ca-Mg-CO_3	Order of abundance
N_1	0-10	62	9.6	1.3	2.8	3.3	0.048	2.0	14.8	$CO_3 > Fe > Mg > SO_4 > Ca > P$
N_2	10-20	61	13.9	1.8	2.5	4.1	0.042	1.9	14.8	$CO_3 > Fe > Mg > SO_4 > Ca > P$
N_3	20-30	58	11.4	1.3	3.7	3.1	0.040	2.0	18.5	$CO_3 > Mg > Fe > SO_4 > Ca > P$
N_4	30-40	48	2.7	1.9	2.8	3.2	0.050	2.0	16.3	$CO_3 > Fe > Mg > SO_4 > Ca > P$
N_5	40-50	43	2.3	1.7	2.9	3.1	0.049	2.0	14.5	$CO_3 > Fe > Mg > SO_4 > Ca > P$
N_6	50-60	42	3.3	1.3	2.5	3.3	0.043	2.0	13.6	$CO_3 > Fe > Mg > SO_4 > Ca > P$
N_7	60-70	43	5.7	1.3	2.5	3.1	0.046	2.0	13.6	$CO_3 > Fe > Mg > SO_4 > Ca > P$
Average		51	7	1.5	2.8	3.3	0.045	2.0	15.2	
D_1	0-10	79	6.5	1.5	3.0	3.5	0.047	2.1	16.2	$CO_3 > Fe > Mg > SO_4 > Ca > P$
D_2	10-20	76	7.7	2.5	2.4	1.8	0.046	2.0	16.2	$CO_3 > Ca > Mg > SO_4 > Fe > P$
D_3	20-30	73	8.1	3.2	2.0	4.0	0.030	2.0	16.2	$CO_3 > Fe > Ca > SO_4 = Mg > P$
D_4	30-40	64	4.3	2.1	3.3	3.1	0.039	2.1	18.4	$CO_3 > Mg > Fe > SO_4 = Ca > P$
D_5	40-50	56	1.6	2.2	3.5	2.0	0.035	1.9	19.6	$CO_3 > Mg > Ca > Fe > SO_4 > P$
D_6	50-60	34	6.4	1.5	1.2	2.0	0.010	1.9	8.8	$CO_3 > Fe > SO_4 > Ca > Mg > P$
Average		64	5.8	2.2	2.6	2.7	0.035	2.0	15.9	

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THE ALLOMETRIC GROWTH OF MYTILASTER MINIMUS AND M. LINEATUS (MOL. BIVALV.) IN TWO BRAKISH WATER LAGOONS

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Abstract.
Allometric growth was comparatively studied in the populations of adults Mytilaster minimus and M.lineatus from the brakish water lagoon Mazoma, of Amvrakikos Gulf and of M.minimus from the Aetoliko lagoon near Messologhi (both in western Greece).
In Mazoma, 150 M.minimus were collected from Zostera leaves,at a depth of 35cm and 118 M.lineatus from stones at approximately 20cm. In Aetoliko where only M.minimus was present,138 individuals were collected at 150cm depth also from Zostera leaves.The dimensions length, height,width of the shell measured were fitted to the allometric equation $Y=ax^b$ and the constants estimated by the least square regression. The significance of departure of the exponent from unity as well as the difference in the slopes of the regression lines between the populations were tested by Student's t-test.
The allometric equations for the three populations are shown in Table 1.

M.lineatus		
$H = 0.829L^{0.817}$	t = 11.746	$P \ll 0.001$
$W = 0.462L^{0.973^+}$	t = 0.719	$0.20 < P < 0.50$
M.minimus Mazoma		
$H = 0.791L^{0.808}$	t = 19.507	$P \ll 0.001$
$W = 0.295L^{1.036}$	t = 1.986	$0.02 < P < 0.05$
M.minimus Aetoliko		
$H = 0.682L^{0.855}$	t = 10.260	$P \ll 0.001$
$W = 0.424L^{0.913}$	t = 7.409	$P \ll 0.001$

Table 1. Allometric relationships between H/L and W/L in the three populations of Mytilaster. Isometry is indicated by$^+$. L=lenght, H=height, W=width of the shell.

In M.lineatus the height shows negative allometry in relation to length i.e. the shell becomes more elongated as it grows. There was no allometric growth between width and length. M.minimus from Mazoma shows negative allometric growth for height but positive for width. In this case the growing shell becomes longer and wider, i.e. more "cylindrical" in appearance. On the contrary, the same species from Aetoliko lagoon shows negative allometry for both height and width, appearing longer but flatter as it grows. Comparison of the allometric equations of different populations of Mytilaster showed that M.minimus from Mazoma and Aetoliko grow differently with a probability $P \ll 0.001$ (t=10.633 for H/L and t=5.794 for W/L). Conversely, the two species of Mytilaster in the same lagoon have a similar type of growth. (For H/L t=0.472, $05 < P$ and for w/L t=1.549 $0.10 < P < 0.20$). It should be stressed that in the last case the two regression lines do not coincide but are parallel, having the same slope b but different constants a ($P \ll 0.001$).

Among factors known to affect shell shape in mussels, are the substratum, crowding, salinity, exposure to waves, nutrition and immersion (Lubet 1976). In the present case the main difference between the sampling locations is the depth, which may - in such shallow and enclosed areas - cause differences in the mechanical action of waves and salinity changes. Possibly, environmental factors may play a more important role in the allometric growth, than the genetic constitution of the species.

References.

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