

A STUDY ON THE MIXED WATERS BETWEEN LAKE EDKU AND THE MEDITERRANEAN SEA

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Résumé : Des échantillons d'eau ont été prélevés dans le chenal reliant le lac Edku à la mer afin d'étudier les variations saisonnières des conditions physico-chimiques. Les résultats sont comparés à ceux obtenus pour deux stations dans ce lac, l'une à proximité du chenal et l'autre éloignée. Les variations des paramètres envisagés dépendent de certains facteurs qui sont discutés.

Summary : Water samples were collected from the channel connecting Lake Edku to the sea in order to study the seasonal variations of some chemico-physical conditions of the mixed waters. The results are compared with those obtained from two locations in this lake, one selected near this channel and the other away from it. The variations of the investigated parameters are found to depend mainly upon certain factors which were discussed.

Seasonal variations of some chemico-physical conditions of the mixed waters between Lake Edku and the sea were studied. Surface water samples were collected monthly during 1969-70 at one location selected in the middle of El-Maadih Channel which connects this lake to the sea. The results are compared with those obtained from two localities in Lake Edku, location B selected relatively near El-Maadih Channel and location C further away from it.

The surface water temperature varied from 13.5 °C in December to 28.5 °C in August. The lower values were recorded in January and February, whereas the higher in June, July and September. The pH values ranged from 7.48 in September to 8.75 in April, with an average of 8.24. The pH gave at location B an average of 8.45, and at location C an average of 8.24. The increase in pH is usually correlated with photosynthetic activity. The chlorosity content varied from 0.55 g/l in September to 23.34 g/l in February 1969, with an average of 5.95 g/l. The chlorosity gave at location B an average of 2.85 g/l, and at location C an average of 1.19 g/l. The remarkable increase in the average chlorosity value in the mixed waters reflects the effect of sea water. The total alkalinity values fluctuated between 129 mg/l in March and 238 mg/l in August, with an average of 191 mg/l. The total alkalinity gave at location B an average of 209 mg/l, and at location C an average of 216 mg/l. El-Maadih Channel, being more affected by the sea water, had the lowest average value of total alkalinity.

The values of total residue TR ranged from 1,520 mg/l in September to 46,792 mg/l in March, with an average of 13,635 mg/l. The TR gave at location B an average of 5,953 mg/l, at location C an average of 3,682 mg/l. The values of fixed total residue (FTR) varied from 1,360 mg/l in September

to 38,337 mg/l in March, with an average of 10,109 mg/l. The FTR gave at location B an average of 4,339 mg/l, and at location C an average of 2,674 mg/l. The average values of TR and FTR in the mixed waters were markedly higher than those at locations B and C, due to the direct effect of sea water in increasing the amounts of dissolved and suspended residues. The values of volatile matter (VM) fluctuated between 160 mg/l in September and 16,884 mg/l in January, with an average of 3,526 mg/l. The VM gave at location B an average of 1,614 mg/l, and at location C an average of 1,007 mg/l. The higher average value of VM calculated from the mixed waters was also correlated with the higher average chlorosity value.

The nitrite values ranged from 11.5 $\mu\text{g NO}_2/\text{l}$ in October to 52.6 $\mu\text{g NO}_2/\text{l}$ in July, with an average of 23.6 $\mu\text{g NO}_2/\text{l}$. Depletion of nitrite was observed in February 1969 and June. The nitrite gave at location B an average of 32.4 $\mu\text{g NO}_2/\text{l}$, and at location C an average of 75.1 $\mu\text{g NO}_2/\text{l}$. The increase in the nitrite content is due mainly to denitrification of nitrate into nitrite (Seenayya 1971) and the discharge of sewage wastes (Hutchinson 1957). The phosphate values varied from 28 $\mu\text{g PO}_4/\text{l}$ in February 1969 to 420 $\mu\text{g PO}_4/\text{l}$ in May, with an average of 145.9 $\mu\text{g PO}_4/\text{l}$. The phosphate gave at location B an average of 262.9 $\mu\text{g PO}_4/\text{l}$, and at location C an average of 276.8 $\mu\text{g PO}_4/\text{l}$. The increase in the phosphate content might be due mainly to the increase of decay of phytoplankton, the release of the adsorbed phosphate into the free water and the discharge of sewage wastes (Saad 1973). The silicate values fluctuated between 0.7 mg SiO_2/l in March and 6.0 mg SiO_2/l in August, with an average of 3.0 mg SiO_2/l . The silicate gave at location B an average of 3.6 mg SiO_2/l , and at location C an average of 4.0 mg SiO_2/l . The increase in the silicate content is due mainly to the decline of diatoms (Bailey-Watts 1976) and the decrease to the uptake by diatoms (Seenayya 1971). The values of dissolved organic matter (DOM) ranged from 1.19 mg O/l in January to 3.22 mg O/l in October, with an average of 2.30 mg O/l . The DOM gave at location B an average of 2.19 mg O/l , and at location C an average of 2.28 mg O/l . The increase in DOM content is due mainly to decomposition of dead plankton and the discharge of sewage and industrial wastes.

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