

Studies of some limnological conditions in Lake Edku, an Egyptian shallow brackish-water lake connected to the Mediterranean Sea, were carried out during 1989 and are compared to published data from the last decades.

Lake Edku, a shallow brackish-water basin connected to the Mediterranean Sea via a narrow channel, has an area of 115 Km² and a depth ranging from 0.5-1.5 m. The main water supply comes from three main drains. Their total discharge during 1989, ranging from 43.8-119.7 x 10⁶ m³, was higher than that reported by NASR *et al.* (1963), but lower than that stated by SAAD (1976). Such fluctuations in the drainage water supply affected markedly the hydrography and chemistry of the lake. Field measurements and water sampling were carried out monthly during January-December 1989 at 15 selected stations.

In lake Edku, being shallow, no thermal stratification was observed. The monthly averages, ranging from 11.9°C in January to 28.6°C in August, suggest insignificant variations with previous readings during 1969-70, ranging from 14.5-28.5°C also in January and August, respectively (SAAD, 1976).

Transparency varied widely from 0.2-1.5 m. The values showed pronounced local and seasonal variations, with annual mean of 0.53 m. The minimum regional average value of 0.31 m at the lake-sea connection reflects the increase in turbidity from stirring up of the bottom material by the lake-sea and sea-lake currents, as well as from the entering suspended load in sewage and industrial wastes from the adjacent Abu-Kir Bay. The decrease in monthly average Secchi readings during April to September suggests the increase in turbidity mainly from phytoplankton abundance in spring and summer. However, the increase in turbidity, especially in winter, reflects the effect of prevailing wind in stirring up the bottom sediments (SAAD, 1978).

The pH was always found on the alkaline side, ranging from 7.11-10.27, with an annual mean of 8.42. The pH values found in the same lake by SALAH (1947) varied from 8.0-8.8, by NASR *et al.* (1963) from 7.5-9.0 and by SAAD (1976) from 7.63-9.50. This confirms that the pH of Lake Edku has been changed in the last decades.

The spatial average pH values varied slightly from 7.97-8.96 and the locations directly influenced by drainage water discharge gave the lowest values. SAAD (1976) also reported the same condition. However, the highest pH values were found at locations densely populated by macrophytes. The monthly averages varied slightly from 7.83 in October to 8.87 in May. Photosynthetic activity is among the main factors controlling the seasonal variations of pH (SAAD, 1976).

Dissolved oxygen (DO) varied markedly from 1.14-12.93 ml.l⁻¹, with an annual mean of 5.3 ml.l⁻¹. The highest DO values were found at locations affected by water mixing and the lowest at areas densely populated by macrophytes and near the drainage water discharge. The highest DO averages in winter coincided with increased aeration by strong wind, low temperature and the decrease in the rate of DO consumption by organic matter decomposition. The low DO averages in spring and summer suggest that the rate of DO consumption exceeded that of its supply from phytoplankton.

Chlorosity varied considerably according to localities and seasons (NASR *et al.*, 1963). The values found by SAAD (1976) varied from 0.44-23.24 g.l⁻¹ compared with the present values ranging from 0.47-7.88 g.l⁻¹. The spatial averages varied noticeably from 0.71-2.27 g.l⁻¹, with an annual mean of 1.20 g.l⁻¹ which is markedly lower than that of 2.92 g.l⁻¹ found by SAAD (1976). The locations directly affected by drainage water discharge gave the lowest chlorosity averages. Thus, distribution of chlorosity in Lake Edku is mainly controlled by the influx of drainage water and the inrush of sea water (SAAD, 1976). The range of monthly averages, from 0.77-2.0 g.l⁻¹ differs markedly from that found by SAAD (1976), ranging from 0.69-10.41.

REFERENCES

- NASR A.B., HASHIM M.M. and ALEEM A.A., 1963.- The flora of Lake Edku, with particular reference to benthic diatoms. *Bull. Fac. Sci., Alex. Univ.* (1961-63) 5: 219-235.
 SAAD M.A.H., 1976.- Some limnological investigations of Lake Edku, Egypt. *Arch. Hydrobiol.* 77: 411-430.
 SAAD M.A.H., 1978.- Seasonal variations of some physico-chemical conditions of Shatt al-Arab Estuary, Iraq. *Est. Coast. Mar. Sci.* 6: 503-513.
 SALAH M.M., 1947.- Some ecological studies in Lake Edku. M. Sc. Thesis, Cairo Univ.