OCCURRENCE AND DISTRIBUTION OF CHEMICAL POLLUTANTS IN LAKE MARIUT, EGYPT

I. RESIDUES OF ORGANOCHLORINE PESTICIDES

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Abstract. Occurrence and distribution of organochlorine pesticides in the water of Lake Mariut, a brackish coastal Egyptian lake suffering from pollution, and their accumulation in the common fish Tilapia were studied. The major pesticides detected in the lake water were lindane, p,p'-DDE, o,p'-DDT, and p,p'-DDT. These compounds, except o,p'-DDT, were detected in the fish samples in exceedingly higher concentrations compared with those found in the lake water.

1. Introduction

The fisheries economy of Egypt depends principally on the Egyptian Lakes. One of these lakes, namely Lake Mariut, has suffered much from intensive pollution in recent years, although at one time it was a highly productive lake. This pollution resulted from the successive increase in human population and industry around this lake. The different kinds of pollutants (agricultural runoff, untreated industrial and sewage wastes) entering into Lake Mariut and reclamation of large areas from this lake for agriculture caused the great decrease in the total fish catch from this lake.

Lake Mariut was subjected to few investigations regarding the effects of pollution on its environment (Saad, 1972a, b, 1973a, b, 1974, 1980; Saad et al., 1973). There are very few studies on pollution of the aquatic environments in Egypt with pesticides (El-Sebae and Abu-Elamayem, 1979; Abu-Elamayem et al., 1979; Hamza et al., 1981). The present study, which represents an essential part of a pilot project on pollution of Lake Mariut supported by IAEA, deals with the occurrence and seasonal distribution of the organochlorine pesticides in the water of this lake as well as their accumulation in Tilapia fish dominate in Lake Mariut.

2. Description of Lake Mariut

Lake Mariut is the smallest brackish water lake adjoining the Mediterranean Coast of Egypt and has no direct connection with the sea. Large areas of this lake were reclaimed for agriculture. The lake is now divided artificially into four parts (Figure 1). The lake proper, which was chosen for the present study, has an area of about 2730 ha and water
depth ranging from 90 to 150 cm. The chlorosity fluctuated between 1.09 and 2.63 g l\(^{-1}\) (Saad, 1973a). Large quantities of drainage waters enter into this lake by two large drains. The Qala Drain supplies the lake with waters from the Alexandria drainage system, heavily mixed with industrial and sewage wastes. The Umum Drain supplies the western side of the lake proper with some drainage waters from Behira Province. Besides, untreated industrial and domestic wastes are discharged continuously into the lake at its northern side. Mex-pumps discharge the surplus water from the lake into the sea to maintain the lake water level at about 2.8 m below sea level.

3. Materials and Methods

Six stations were selected to represent different regions in Lake Mariut. Two other stations were also chosen from Umum Drain and Qala Drain at their connections with the lake (Figure 1). Sampling of water was carried out monthly at all stations during a period of one year (from August 1978 to July 1979). Water samples were taken about 20 cm below the water surface to avoid floating matter. Solvent glass containers were used for collecting water samples. Fish samples of *Tilapia* were captured from Lake Mariut in the four different seasons of the sampling period.