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PHYTOPLANKTON IN MANZALAH FISH - FARM.

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ABSTRACT

Unlike other Egyptian lakes and River Nile, phytoplankton in Manzalah Fish-Farm belong to **Cyanophyta** and **Chrysophyta**. The former was the most dominant group forming 61.65% of the total phytoplankton. **Cyanophyta** was represented by **Anabaena sp.** (29.64%), **Oscillatoria sp.** (28.49%) and **Anabaenopsis sp.** (3.52%). **Chrysophyta** was less dominant, being composed mainly of **Nitzschia sp.** (37.27%) and other species of rare occurrence (1.08%). These included **Pleurosigma, Gyrosigma, Diploneis, Surirella, Nostoc, Synedra and Melosira** species.

INTRODUCTION

Manzalah fish farm lies close to the southern shore of the brackish Manzalah Lake. It occupies an area of 300 acres which is divided into 15 equal rearing ponds 16 acres each, and 36 nursery ponds of varying sizes. It is supplied with water from two sources, a brackish water (Navigating canal) and a supplementary fresh water (Tawabra canal). The average depth of water in the ponds was kept between 60 to 80 cm.

While the fish production in Egyptian fish farms have recieved detailed study (Bishai et al, 1973 and Eisawy et al, 1974) little is known of phytoplankton of these farms, although it is an important group as a source of food for phytophagous cultured fish. These were represented in Manzalah Farm by the carp **Cyprinus carpio** and the mullet **Mugil cephalus.** The main food items in the gut of the latter were diatoms, plant detritus, filamentous algae and small invertebrates (Bishara,1967). The carp feed mainly on animal food and little plant food depending on the size of the fish (Bishai et al, 1973).

The objective of this study is to fill the gap on the phytoplankton in Manzalah ponds which is an essential food item of the cultured fish. Moreover, **Tilapia zillii** which enter the pond with the water current and form 63.3% of the yield is also a phytophagous fish (Bishai, 1980).

MATERIAL AND METHODS

A sample of twenty liters of water was collected monthly from each rearing pond. It was filtered through a plankton net (55 micron mesh diameter) and concentrated to 20 ml. with 5% formalin solution. The phytoplankton were counted using a 1 ml. Sesgwick Rafter counting cell. Each sample was counted in three different cells, counting 10 squares ineach cell. During the first three months after stocking i.e. October to December 1978, the total phytoplankton was recorded. Afterwards it was decided to study in detail different groups relating its percentage occurrence to that of total phytoplankton as cell per liter (cell/L). As there was no marked difference in the number of phytoplankton in different ponds their mothly average was considered.

RESULTS

The standing crop of phytoplankton in Manzalah ponds was low during October to December ranging from 90 to 200 cell/L. It gradually increased during January to March from 645 to 760 cell/L (Table 1 and Fig. 1). A marked increase of phytoplankton reaching 16108 cell/L occurred in April, which dropped to 5305, 70 and 77 cell/L in May, June and July respectively. Afterwards, it slightly increased to 351 cell/L in August and 398 cell/L in September.

The phytoplankton community in Manzalah ponds was represented by

Table 1
Monthly total number in cell / L , and percentage frequency of main phytoplankton species in Manzalah ponds.

Month	Total No. cell / L	% frequency of main phytoplankton spp. Nitzschia	Oscillatoria	Pleurosigma and Gyrosigma	Anabaenopsis
Jan.	645	10.5	0.0	6.1	83.4
Feb.	700	42.5	13.9	38.7	4.9
Mar.	760	26.2	24.6	6.7	40.3
Apr.	16108	53.2	2.6	0.2	0.0
May	5305	0.3	99.6	0.	0.0
June	70	18.8	63.0	18	0.0
July	77	21.8	68.8	0.0	0.0
Aug.	351	0.3	86.3	3.3	0.0
Sep.	398	0.8	96.4	2.8	0.0
oct.	123	0.0	0.0	0.0	0.0
Total	24537	37.27	38.49	0.7	3.53

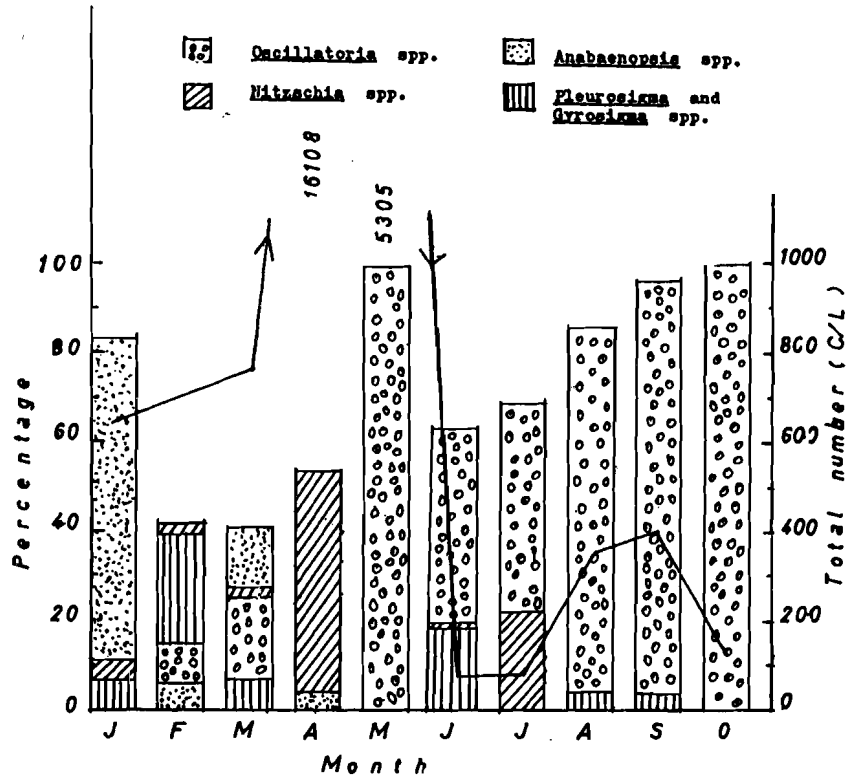

Fig. 1. Monthly total number in cell/l, and percentage frequency of main phytoplankton species in Manzalah Ponds.

two main groups, Cyanophyta and Bacillariophyceae which include the following species

1) Cyanophyta: **Oscillatoria** spp., **Anabaena** spp. and **Anabaenopsis** spp.
2) Bacillariophyceae: **Melosira** spp., **Synedra** spp., **Gyrosigma** spp., **Nitzschia** **Pleurosigma** spp. and **Surirella** spp.

As shown in table 1 and figure 1, the occurrence of phytoplankton species can be described as follows

Oscillatoria spp. were not represented in January samples, rarely occurred in April and were less frequent in February and March. Nevertheless, they were more frequent to dominant during May to October forming 63 % to 100 % of the total phytoplankton.

Nitzschia spp. were less frequent in January, but it became more frequent in February and April. They decreased in March, June and July and rarely occurred during August, September and October.
Pleurosigma and **Gyrosigma** spp. were frequent in February less frequent in June and rarely represented in other months.

Anabaenopsis spp. were dominant in January but, showed a sharp decrease in February. It increased again in March then it disappeared from the sample during April to October.

Anabaena spp. and **Nostoc** spp. occurred only in April and July respectively.

Melosira spp. appeared in July and August.

Other phytoplankton species were poorly represented and appeared during one month only such as **Surirella** spp. in March, **Diploneis** spp. and **Synedra** spp. in August.

It seems that **Oscillatoria** spp. dominated in all the ponds throughout the period of investigation, especially during May and October. This was followed by **Nitzschia** spp. The other species can be arranged according to their dominance as follows : **Pleurosigma, Gyrosigma, Anabaenopsis, Anabaena, Melosira, Synedra, Surirella, Nostoc** and **Diploneis spp.**

DISCUSSION

It is known that tropical and subtropical ponds differ from lakes in the absence of most truly limnetic plants and animals, therefore pond organisms are essentially a mixture of littoral and benthic forms. Wesenberg-Lund (1930) made an extensive comparison of the plankton of Danish lakes with Danish ponds and arrived at conclusions among which

A- Diatoms are common in lakes and almost absent in ponds.
B- Ponds maintain a greater production of Myxophyceae and desmids.
C- Rotifers occur in ponds and exhibit somewhat different form of growth.

Reid (1967) pointed out that the phytoplankton population in ponds is mainly composed of Cyanophyta, Bacillariophyceae and considerable kinds of chlorophyta.

The present results indicate that Cynophyta represented the main group of phytoplankton i.e. 61.65 %, represented by **Oscillatoria, Anabaenopsis, Anabaena** and **Nostoc** spp.

Comparing these results with previous work obtained from other Egyptian

waters, it can be observed that it differs from that found by Salah (1959, 1960) in the Nozha Hydrodrome and lakes Mariut and Edku, where he gave a different community pattern with Bacillariophyceae as the dominant group followed by Chlorophyta, Cyanophyta and Euglenophyta. Within the Nile River, El-Ayouty and Awad (1976) gave the same community composition as Salah (1959 , 1960) and concluded that toward the end of the two Nile-branches Cyanophyta predominates than the other groups.

El-Nayal (1965) working on the Nile and Egyptian freshwater, mentioned that many members of the Euglenophyceae and Myxophyceae were relatively abundant in ponds and ditches, especially in summer, such a flora is a suggestive of organic contamination. Elster and Jensen (1960) found that the most dominant Cyanophyta species in Nozha Hydrodrome were **Nostoc, Oscillatoria** and **Lyngbya** spp.

It is concluded that periodicity in the occurrence of phytoplankton species may be attributed to the change of physical and chemical conditions of the water which agrees with the observations of Samaan (1974) on Lake Edku.

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