6. SUMMARY AND CONCLUSIONS

Three experiments were conducted in the present study to investigate the effect of some managerial and physical factors on water quality parameters as well as the plankton abundances.

The first experiment:

Was performed in earthen ponds at Abbassa, Abo Hammad, Sharkia governorate (ICLARM) with the total area of one hectare. The experiment aimed to study the effect of size of catfish as predator cultured with tilapia on water quality parameters and plankton abundances. Three sizes 100, 200 and 300g of catfish with Nile Tilapia (40g), where each size of catfish was represented in two replicates. All experimental ponds were stocked at a rate of 3 fish/m3 where tilapia represented 95% and catfish represented 5% of the stock. Results obtained are summarized in the following:

Water quality

1. Water temperature

The highest reading of water temperature in treated ponds was recorded in September while the lowest was in October and it ranged between 25.5 and 28°C.

2. Dissolved oxygen

The highest total average value recorded for dissolved oxygen in treatment CF100 (8.21 mg/l) while the lowest was in treatment CF200 (8.03 mg/ l).

3. Secchi-disk (SD)

The observations of secchi-disk ranged between 11.00 and 16.3 cm during the experimental period.

4. The hydrogen ions (pH)

The values of pH in treated ponds were ranged between 8.50 - 8.85.

5. Salinity

The salinity ranged between 0.26 and 0.33 g/l.

6. Total alkalinity

The total alkalinity ranged between 280.5 and 353.7 mg/l.

7. Total hardness

The total hardness ranged between 203.75 and 239.75 mg/l.

8. Unionized ammonia

Treatment CF100 recorded the highest concentration of free ammonia (0.4 mg/l) during September while the lowest concentrations were in treatment CF200 (0.09 mg / l) during October.

9. Nitrite

The concentration of nitrite in treated ponds was ranged between (0.054 to 0.074 mg/l) during the whole experimental period.

10. Nitrate

The concentration of nitrate was ranged between 0.47 to 0.81 mg/l.

11. Total phosphate

The highest value of total phosphate found in treatment CF100 (1.32 mg/l) during July while the lowest value found in treatment CF300 (0.59 mg / l) during September.

12. Soluble phosphate

The highest value of soluble phosphate found in treatment CF100 (0.65 mg/l) during July while the lowest value found in treatment CF200 (0.43 mg / l) during August.

Biological analysis of water

1-phytoplankton

The mean of the total average of phytoplankton population was dominated by green algae especially chlorella in treatment (CF100) during October which was 19375 Ind. x 10^3 /L.

2- Zooplankton

The highest group was rotifers especially in treatment (CF300) during October which was 558 Ind. /L.

3- Total bacterial count

The highest number of bacteria was 96.83 x 10^2 CFU/ML in treatment (CF300) during July.

Proximate analysis of fish

Average values of crude protein and fat contents in fish bodies for treatments CF100 was higher than those in the other two treatments.

The second experiment:

Was conducted in ten 60-m^2 earthen ponds (five treatments with two replicates for each) at a private fish farm in the region of Baallwa - Wadi EL-Mollak, Ismaellia governorate. Each pond was stocked with mono-sex Nile tilapia (*Oreochromis niloticus*) at a density of 2 fish /m^3 with an average weight of 4 g. The first treatment feeding tilapia to suspend the industrial rate of 25% protein 3% of biomass 6 days / week for 4 months - the second treatment included the fertilization rate (1.5 kg chicken manure + 400g triple super phosphate + 200 g urea/ pond/ biweekly for 4 months) - the third treatment was the application of chicken manure plus triple super phosphate and urea at the same rate of the second treatment for the first 30 days followed by fish feed with the same rates used in the first treatment - the fourth treatment was the addition of chicken manure plus triple super phosphate and urea at the same rate of the second treatment for the first 60 days followed by fish feed for the last 60 days with the same rate used in the first treatment - the fifth treatment was the

addition of chicken manure plus triple super phosphate and urea at the same rate of the second treatment for the first 90 days then fish feed were added till the end of the experiment with the same rate used in the first treatment. Results obtained are summarized in the following

Water quality

1. Water temperature

The highest reading of water temperature was recorded in august while the lowest was in October and it ranged between 26.45 and 30°C during the study period.

2. Dissolved oxygen

The highest total average value recorded for dissolved oxygen was in treatment (T2) (9.95 mg/l) while the lowest was in treatment (T1) (7.92mg/ l).

3. Secchi-disk reading

The observations of secchi-disk ranged between 12.5 and 23.2 cm during the experimental period.

4. The hydrogen ions (pH)

The values of pH were ranged between 8.00- 9.00 during the study period.

5. Salinity

The salinity ranged between 6.9 and 7.8 g/l.

6. Total alkalinity

The total alkalinity ranged between 732 and 909.5 mg/l.

7. Total hardness

The total hardness ranged between 609.5 and 690.

8. Unionized ammonia

Treatment (T3) recorded the highest concentration of free ammonia (0.53 mg/l) during August while the lowest concentrations were in treatment (T1) (0.09 mg / l) during July.

9. Nitrite

The concentration of nitrite was ranged between 0.010 to 0.055 mg/l.

10. Nitrate

The concentration of nitrate was ranged between 0.07 to 0.41 mg/l.

11. Total phosphate

The highest value of total phosphate found in treatment (T3) (0.61 mg/l) during August and the lowest value found in treatment (T3) (0.05 mg / l) during October.

12. Soluble phosphate

The highest value of Soluble phosphate found in treatment (T3) (0.22 mg/l) during July and the lowest value found in treatment (T3) (0.015 mg / l) during October.

Biological analysis of water

1-phytoplankton

Phytoplankton population was dominated by green algae. The highest total number of green algae was during August in treatment (T2) which was 28827.2 Ind. x 10^3 /L especially chlorella the dominant species which was 13500 Ind.x10^3/L.

2- Zooplankton

The highest group was rotifers especially in treatment (T5) during July was 5135 Ind. /L.

3- Total bacterial count

The highest number of bacteria was 65.00 x 10^2 CFU/ML in treatment (T2) in October.

Proximate analysis of fish

The highest CP content was obtained by treatment (T2) and the highest fat and ash contents was obtained by treatment (T1)

The third experiment:

Three batch experiments were conducted in the wet laboratory of limnology department at Central Laboratory for Aquaculture Research (CLAR).

A-Growth response of *Chlorella vulgaris* to various salinity concentrations:

The growth was more intensive at low salinity concentration than high salinity concentration.

B - Growth response of *Chlorella vulgaris* to various light intensities:

The growth was more intensive at high light intensities than low light intensities.

C - Growth response of *Chlorella vulgaris* to various temperature degrees:

The growth of *Chlorella* at 25 °C was faster than at lower temperature. The relative high temperature (at 35 °C) led to a depression in growth of *Chlorella* cells.