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SUMMARY AND CONCLUSION

This thesis consists of three chapters; the first chapter deals with general introduction about water physico-chemical and biological characteristics, and heavy metals in ponds water and fish muscles. Also, the objective of the work was studying the effect of two different managements of fish ponds on water quality, and fish productivity. In addition, literatures reviews are described to correlate our study with the published data. The published data of the literatures were classified into three categories; the first one is focusing on the physico-chemical characteristics of water. The second one is focusing on the biological characteristics of water and the third one is focusing on heavy metals in water and fish muscles.

The second chapter of this thesis deals with the materials from water supply and ponds and methods. This chapter includes also the collection of water samples, the chemicals, solutions, equipments, methods of analyses and calculations. The chapter also includes the description of this study. However, this study was conducted during August 2005 – January 2006 in two groups of fish ponds; each group contained 6 earthen ponds. The ponds of the first group were polycultured by Nile tilapia, striped mullet, common carp, and silver carp and fertilized by chicken manure (40 kg/feddan/week). Also, 16.2 kg/feddan/week of mono-superphosphate (15.5% P_2O_5) and 8 kg/feddan/week of urea (46.5% N) were applied. After 3 months of the experiment beginning, the artificial feed (25% crude protein) was supplemented at a rate of 3% of fish biomass two times daily (9:00 and 13:00). Theses ponds were supplied by freshwater derived from El-Wadi canal and El- wadi agriculture drainage. In the second one, fish ponds were stocked by Nile tilapia only and fertilized by chicken manure (75 kg/feddan/week). After 3 months of the experiment beginning, the

artificial feed (25% crude protein) was supplemented at a rate of 3% of fish biomass two times daily (9:00 and 15:00). These ponds were supplied by freshwater derived from El-Ismailia canal throughout El-Gadoon canal.

The third chapter represents the results and discussion. The obtained data of physico-chemical and biological parameters of ponds water collected from August 2005 to January 2006 were tabulated and figured. This chapter also includes the results and discussion of heavy metals in ponds water and fish muscles and livers, chemical composition of fish muscles, and fish productivity at both managements.

The obtained results are summarized as follows:

- 1- The physico-chemical characteristics of ponds water in both groups showed significant differences in dissolved oxygen, pH, Secchi disk visibility, water conductivity, total alkalinity, total hardness, ammonia, total ammonium, nitrate and orthophosphate. Meanwhile, water temperature showed no significant difference during the experimental period.
- 2-The total phytoplankton and Zoo plankton of water supply to polyculture ponds were higher than those of water supply to mono culture ponds but the abundances of phyto- and zoo-plankton were higher in monocultured ponds than those of polycultured ones. The phytoplankton population was dominated by green algae followed by blue green algae whereas diatoms represented the lowest count. Zooplankton population was dominated by cladocera in polycultured ponds followed by copepoda, then rotifers. In monocultured ponds, copepoda was the dominant group followed by cladocera, then rotifers.
- 3- The concentration of heavy metals of water supply to polyculture ponds were higher than those of water supply of mono culture pond but in

ponds water, the concentrations of Pb, Cd, Mn, Cu, Zn, and Fe were higher in monocultured ponds than those in polycultured ones.

- 4- In fish muscles and livers, the concentrations of Pb, Cd, Mn, Cu, Zn, and Fe were significantly higher in monocultured Nile tilapia than polycultured one. Moreover, the total concentration of each heavy metal accumulated in the organs of all fish species in polycultured ponds was higher than that of monocultured ones.
- 5- There were no significant changes in proximate chemical analyses in Nile tilapia at both managements, but significant changes were observed among different fish species in polyculture system.
- 6- The yield of monocultured Nile tilapia was significantly higher than that of polycultured one, but the total fish production in polycultured ponds was higher than that of monocultured ponds.
- 7- The concentration of heavy metals in water ponds and fish muscle tissue in monoculture system were significant higher than those of polyculture ponds but the water supply of ponds showed the vice versa.

In addition to the previous chapters, Arabic and English summaries were added. Also, this thesis contained a list of the references used in different chapters of this thesis.

The present study concluded that polyculturing of fish species in ponds is more appropriate to obtain the higher fish production and flesh quality.