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Study on the role of water quality on the accumulation of some heavy metals in fish farms

Thesis Submitted By

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ABSTRACT

Monitoring of water quality is very important, where it is the main factor impacts the cultured fish. So, the present study investigates factors affecting fish culture in some fish farms that use different sources of water (fresh water, agriculture drainage and sewage wastewater). In three different farms at Abbassa and Hessania, Sheikh governorate, Egypt. Water and fish samples were taken monthly during 2016 fish farming season, to evaluate the physical and chemical and biological characteristics and heavy metals distribution in water and fish organs (muscles ,gills and liver).

Results obtained from this study indicated significant difference between the water of the three farms, particularly in their physical and chemical characteristic (water temperature, pH, electrical conductivity, TDS, total and calcium hardness, total Alkalinity, phosphate,NH_3, NO_2, NO_3, DO and transparency). Heavy metals varied depending upon the organ, location and the month of sampling. Also, the order of occurrence of heavy metals in water ranked at the following order,

Fe > Zn > Mn> Cu> pb > Cd at fish farm (1), but at fish farm (2) it was Fe > Mn> Zn > Cu>Pb>Cd, while it was Fe > Mn> Zn > Pb>Cu>Cd in fish farm (3). the level of concerned heavy metals in musculature and liver tissues in the three studied fish farms recorded in the order of Fe > Zn > Cu >Mn > Cd > Pb , except its order in liver in farm (1) had the order Fe > Zn > Mn >Cu > Pb > Cd, also gills in farm (3) had the same order while the gills in farm (1) had the order Fe > Zn > Cu >Mn > Pb > Cd, but in farm (2) had the order Fe > Zn > Mn Cu > Cd > Pb. The levels of heavy metals exceeded the permissible limits according WHO (1989), in gills and liver, but in muscles did not exceed the permissible limits, except Fe. Comparison of the values of

condition factor (K) and hepato-somatic index (HSI) of the three studied fish farms indicated that fish of farm (1) was the best condition**.** In the present study phytoplankton was represented by four groups namely Chlorophyceae, Cyanophyceae, Bacillariophyceae and Euglenophyceae, where Chlorophyceac dominated over other groups of phytoplankton in farm (2) while Cyanophycea dominates in farm 1 and Bacillophycea in farm 3. Potential adverse health effects in such applications could be avoided if the wastewater is sufficiently treated before use.