certain studies on the effect of some pollutants on fresh water fish

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It is well known that the River Nile especially at Al-Tabeen area-about 30 km south of Cairo recieves a lot of drainage water comming out from several factories in the area especially the Iron and Steel factory.Analysis of the mixed Nile drainage water (about two meters far from the shore at Al-Tabeen) revealed that there are high levels of iron (35.5 mg/l), moderate levels of manganese (3.1 mg/l) and zinc (1.8 mg/1) and low level of copper (0.05 mg/l)The Nile teleostian fish; Oreochromis -niloticus was choosen for the present investigation. The fish were obtained from El Abbasa fish farm (Sharkja Governorate). Following acclimatization of fish for a one week period, they were grouped at randon, each consists of 10 fishes and were transferred to glass aquaria (20 litre each). One group was considered as a control and the others were raised for one week period in water containing any of iron, manganese, zinc and copper salts at three dose levels. The low dose level was comparable to that of Al-Tabeen water, the intermediate and high doses were double and tripple of that concentration. At the end the test period each fish was dissected and selected tissue samples(liver and brain) were excised after collecting blood by severing the caudal peduncle.Total protein and the activity of each of GOT, GPT and acid phosphotase (AP) and alkaline (AIP) phosphatases of serum, liver and brain were determined. Erythrocyte (RBC) count, haemoglobin (Hb) content and haematocrit (HC) value were determined also. The results indicated that:The high iron dose was lethal to the fish. Total serum protein of each of the metal treated fish was increased significantly at all metal dose levels used. The total protein contents of liver and brain showed also a significant increase when single metal dose levels were used. This increase was suggested to be partially due to increased metalloprotein (metallothionine) synthesis as a response to metal treatment.Similarly each of serum GOT, GPT and acid and alkaline phosphatases activity was increased significantly while that of liver and brain was decreased significantly due to single metal dose treatment. This was ascribed on the leakage of these enzymes from tissues into the blood as a result of action of the metals. Beside, the distructive effect of these metals on the enzymes.The results of haematology indicated a significant increase of red blood cell count, haemoglobin content and haematocrit value at all metal close levels used. However, fish treated with zinc showed a significant decrease of red blood cell count, haemoglobin content and haematocrit value. The increase R BC count, 1-lb level and FIC values as a result of iron,Slant?I(Ilmanganese and copper treatment were interpreted due

to haemoconcent•ation. The decrease of the a forementioned parameters after zinc treatment was interpreted to damage of the gills by the action of the metal and subjection of the fish to some form of hypoxia.On the other hand, fish groups reared for one week period in paired metal combination (iron and manganese, iron and zinc, iron and copper, manganese and zinc, manganese and copper and zinc and copper) at threedose levels showed significant increase of the total protein of serum, liver and brain.Also each of serum GOT, GPT and acid and alkaline phosphatases activity of paired metal treatments showed a significant increase in the enzyme, activities and that of liver and brain revealed a significant decrease in their activities. This was interpreted to the interference of these metals and changes of cell permeability. It was concluded that each of zinc and manganese at the high iron dose level counteract the lethal effect of high iron dose. Copper, on the other hand did not antagdnise the lethal effect of iron and all fish died. Concerning, the haematological results of Oreochromis niloticus for one week period with paired metals combinationspointed out that there was a significant increase in each of RBC count, haemoglobin content and haematocrit value. This was due to changes in the osmolality of the blood.