# Summary

Water pollution caused changes in the drinking water, rivers, lakes and oceans all over the world. Consequently, this harms human health and the aquatic environment. In Egypt, there are many sources of pollution such as agricultural, industrial, sewage and drainage sources which discharge their water in the River Nile and cause alterations in the respiratory function of the blood of aquatic organisms. This study was carried out on Rosetta branch to evaluate the effect of agricultural contamination by Sabal drain which is agricultural one located in Menoufiya province, and discharges its water into Rosetta branch of the River Nile and industrial contamination in Kafer Elzyate (benofer). Modulation of the respiratory functions of blood of tilapia fish *Oreochromis niloticus* by water pollutions was studied and also some parameters of water. Water and fish samples were collected from three different locations of the River Nile.

**\*control:** Rosetta branch at El-Kanater El-khyria (mostly not contaminated).

**\*Sector I:** Rosetta branch downstream Sabal drain outlet (agricultural contaminations).

**\*Sector II:** Rosetta branch downstream industrial area of Kafer Elzyate at Benofer region (Industrial contaminations).

**The study includes:**

**(1) Physico-chemical characteristics of water:**

The highest water temperature was recorded in the control 18.03 $°C$, while the lowest one was recorded in sector II 14.9 $°C$. The pH values were highly significantly low in sector I and II in comparison to control.

Total alkalinity (carbonate and bicarbonate) was highly significantly high in the two sectors I and II in comparison to control.

The electrical conductivity of water samples was highly significantly high in the sector I and II in comparison with control.

The total dissolved solids and turbidity were significantly high in the two sectors I and II in comparison with control.

Ammonia concentration in the water samples of Rosetta branch was highly significantly high but the maximum value was recorded in sector I in comparison with control.

The dissolved oxygen was highly significantly low in the sector I in comparison with control.

Results of the biological oxygen demand and chemical oxygen demand were highly significantly high in sector I and II, in comparison with control.

Cations, such as sodium, potassium, calcium and magnesium and anions, such as chloride, phosphate and nitrate were highly significantly high in sector I (downstream sabal drain outlet) in comparison to control.

Heavy metals namely iron, manganese, zinc, copper, lead and cadmium were highly significantly high in sector I in comparison to control.

## (2) Hemoglobin content and respiratory functions of blood.

The obtained results of blood hemoglobin contents were highly significantly high in sector I and II when compared to the control.

Blood gases and acid base status parameter in both arterial and venous blood of fish in sector I and II indicated respiratory acidosis that represented by the increase in $PCO_2$ and decrease in $PO_2$, with decrease in $PCO_2$ in sector I. The data also indicate the compensation of the respiratory acidosis by metabolic alkalosis.

The oxygen equilibrium curve of the fish of both sectors I and II were located on the left of that of the control fish with decrease in $P_{50}$ due to the increase in pH, which means there is high oxygen affinity.