INTRODUCTION

The Ismailia Canal provides water for Egyptian citizens, living in northern part of Cairo, Shubra El-Khema, Mattaria, Musturod, Abu-Zaabal, Inchas, Belbeis, Abbasa, Abu-Hammad, Zagazeeg, El-Tell El-Kabier, and finally Port Said, Ismailia and Suez. The Ismailia Canal represents the most distal downstream of the Nile River, so its water contains all pollutants discharged into the Nile. Direct and indirect activities, along the canal, also pollute its water **(Geriesh *et al*., 2008)**.

In Egypt, the River Nile, its branches and its canals (like Ismailia Canal water) resemble the main sources of drinking water. All these sources unfortunately, receive heavy loads of industrial, agricultural and domestic wastes. Drinking water must meet specific criteria and standards to ensure that water supplied to the pipes is safe and free from pathogenic microorganisms as well as hazardous compounds **(WHO, 1993)**.

Pollution is the most serious of all environmental problems that poses a major threat to the heath and well being of millions of people and global ecosystem **(Alloway and Ayres, 1997).** During the past decade, it has become evident that protection and efficient use of water resources must become at the top national priority, particularly, with expecting of continuous technological development, however, increasing urbanization, industrialization, agricultural and other human activities have caused enormous deterioration of water sources *i.e.* considerable chemical and microbial pollution in the most of water bodies, particularly the rivers **(Ayman, 2009)**.

The present study aimed to reach the following objectives: assessment of the influence of effluent discharge on Ismailia Canal water quality, find a bioagent to reduce counts of some isolated bacterial pathogens and finally, assessment the ability of a certain type of nanocomposite to reduce the levels of some pollutants.

To reach these objectives, the following methods were done:

1. Physico-Chemical assessment of water samples, through which the following parameters were measured seasonally; temperature, total alkalinity, dissolved oxygen, biochemical oxygen demand, chemical oxygen demand, ammonia, major anions, major anions and trace metals according to **(American Public Health Association "APHA", 2005)**.

2. Microbiological assessment of water samples, which was repeated also seasonally and include the following; total viable bacterial count, total spore-forming bacteria, total coliform, fecal coliform and fecal streptococci, *Aeromonas hydrophila*, *E. coli*, *Pseudomonas aeruginosa*, *Enterococcus fecalis*, *Salmonella sp.*, *Shigella sp.*, Assaying for bacteriophages, Counting of Fungi.

3. Sanitation using the isolated bacteriophage on selected water sample.

4. Sanitation using Nanocomposite on selected water sample.