# Introduction

Today's fish industry is facing new challenges, with more complex products and processes that require intensive controls during their processing, storage and distribution. Fish is frequently eaten by Egyptians especially those who live in the Nile Delta. Raw fish in Egyptain markets is usually distributed in wooden containers on open quaysides or in market places. So, there are several potential dangers in this. The often longth exposure to increase temperatures permits spoilage bacteria to multiply. Wooden containers are difficult to clean and are frequently poorly cleaned. Flies and possibly rodents have access to the fish. Fish are rinsed with water of quationable microbiology quality. **(Saddic, *et al.* 1985).**

Fish are an important protein source in many developing countries including Egypt. Fish contain protein of a high biological value, essential minerals, vitamin, fat, iodine, fluorine and appreciale amounts of cobalt, magnesium, phosphorous, iron and copper **(Haard, 1995 and Gram and Huss, 2000).**

Seafoods, especially fish, are one of the most perishable foods. The muscle tissue of fish spoils faster than mammalian muscle. The higher water content, the high free aminoacid content, and the lower connective tissue as compared to other flesh foods leads to the more rapid spoilage fish. The higher ultimate pH and the colder water temperature, facilitate the decreased lag time, and more rapid reproduction of bacteria, even with refrigeration **(Alberto-Pedrose and Regenstein, 1988).**

Fish are subjected to many risks of contamination from various sources either during their presence in their aquatic environment sewage contaminated harvesting areas or after being harvested by workers, utensils and equipment during transportation, distribution and food preparations **(National Academy of Science, 1985).**

Preservation methods are used to prevent both chemical and biological deterioration of food. A combination of preservatives to control both chemical and biological deterioration can further extend the shelf-lif **(Branen, 1993).** Freezing is a popular method of preserving fish. The quality of the fish after freezing can only be as its original quality, but if done correctly, freezing may provide consumers with the finest quality fish wherever they may be located **(Regenstein and Regenstein, 1991).** The use of gamma irradiation as a safty technological treatement in the food preservation has now become legally accepted in many countries of the world. Up to 2002, 51 countries have approved the use of gamma irradiation in food preservation **(IAEA, 2002)**. In 1999 joint FAO/ IAEA/ WHO study group of irradiated food concluded that, no ceiting should be set for irradiated food with doses greater than the currently recommended upper level of 10 kGy by the codex alimentary commission and reported that dose greater than 10 kGy can be considered safe and nutritionally adequate when produced under stablished good manufacturing practice **(WHO, 1999).** The ionizing radiation has a positive effect on maintaining the quality and freshness of seafood's. The advantage of using ionizing radiation as a processing method well reduce or eliminates 90-95%of microorganism responsible for spoilage and subsequently will extend the fish storage shelf-life **(Grodner and Andrews, 1991; Shawki 1998 and Shawki 2004).** Potassium

sorbate is one of the most common preservatives which successfully used in keeping the quality of fish and fish products. It is the salt of sorbic acid which is metabolized in the body like others fatty acids **(Lueck, 1980).** Essential oils have natural antimicrobial properties with the potential extend the shelf life of food when used alone or in combination with other preservation techniques **(Mejiholm and Dalgaard, 2002).**

The aim of the present study is directed to evaluate the effect of different preservation methods viz. freezing process, gamma irradiation (1 and 3 kGy), potassium sorbate (1% and 2%) and Mint oil (1% and 2%) on the microbiological ,chemical properties and organoleptic evalution of Tilapia (*Oreochromis niloticus*) flesh.