ABSTRACT

The Gherkin (*Cucumis sativus*) is a cucumber type vegetable, belongs to the family *Cucubitaceae* that use mostly for pickle products fermenting with the brine solution. Softening of Gherkin during fermentation is a problem that degrades middle lamella containing pectic substances of fruit tissues.

This study was conducted to identify the causal organism(s) responsible for the softening of gherkin during fermentation process, at the Division of Plant Pathology, Horticultural Crops Research & Development Institute, Gannoruwa, Peradeniya and Sunfrost limited, Alawwa from 3rd of November 2008 to 20th of March 2009. Initial Symptoms were identified as bubble formation on skin, mostly 25-44 mm diameter size fruits during first 5-7 days that is being brining. Ultimately the whole interior flesh would be destroyed remaining only the skin part. Microscopic observation shown that middle lamella of the tissues was destructed of the defected area of brined fruits while it remains undistracted in undefected areas.

According to the analysis of the brine solution, pH of the brine solution varies between 2.8-3.5, acidity 0.5-0.81% and salinity 5 -8.5% within first 30 days of fermentation. Dissolved oxygen concentration in brined solution is not distinctively varies between the top and bottom layer of the vats. During the first 14 days dissolved oxygen content varies between the ranges of 6-8mg/L.

The results of the presumptive microscopic observation and streak plate technique on PDA medium were clearly emphasized that any fungal mycelium growth was not present, in the fruits except *Yeast* and *Actinomycetes* of defected fruits kept in the humid chamber. Also according to the observation on MacConkey agar, brine solution doesn't contain any presumptive coliforms. The study was able to identify gram (-), cocci shaped, catalase (+) bacteria and gram (+), diplobacilli bacteria. Further biochemical tests are necessary to identify the exact types of microorganisms. Also it was found that the softening of the fruits was not caused by the obligatory parasites as the fruits remain undefected after injecting the defected fruit ooze It has recorded that the defect caused by the genera *Fusarium*, *Alternaria*, and *Mucor* But this study proved that no positive correlation between these genera in softening of gherkin A detailed investigation is needed to be carried out to find the reasons for the softening mainly during the Yala season and localized fruit softening

Key words: Gherkin fermentation, microbial softening