## EFFECT OF DIFFERENT PACKAGING MATERIALS ON EXTENDING THE SHELF LIFE AND POSTHARVEST QUALITY OF TOMATOES IN REFRIGERATED CONDITIONS

## Jonathan F. T.\* and Mahendranathan C.

Department of Botany, Faculty of Science, Eastern University of Sri Lanka, Sri Lanka \*ftjonathan20@gmail.com

Tomato (Solanum lycopersicum L.) is one of the most widely cultivated and extensively consumed horticultural crops. It is one of the very perishable produces and it changes continuously after harvesting. So, the choice of packaging material is crucial for prolonging the shelf life and preserving the quality of the tomatoes. This study aimed to assess how different packaging materials affect the shelf life and quality of tomatoes stored in refrigeration at 20 °C. Tomatoes at the turning stage were packed in lowdensity polythene bag (LDPE), paper bag, and plastic container, with three replicates per treatment, and stored in a refrigerator along with a control (unpacked). In each treatment, there were 08 tomatoes for three replicates and a total of 96 tomatoes were used in this experiment. Physiological weight loss (PWL), overall acceptability score, total soluble solids (TSS), pH, titratable acidity (TA), and vitamin C were measured at one-week intervals, for 04 weeks. One-way ANOVA was performed for each parameter in order to identify the statistical significance among the packaging materials. Results revealed that packaging materials had a significant effect on PWL, pH, and TA. Tomatoes packaged in paper bag experienced the highest PWL (6.83±0.77 %), lowest overall acceptability score, shortened shelf life, highest pH (3.65±0.13), highest TSS (4.44 Brix %), rapid rate of increase in TA and lowest vitamin C content (30.67±0.92 mg/100ml) compared to other packaging materials. In contrast tomatoes in LDPE bag showed the lowest PWL  $(2.04\pm0.43\%)$ , highest overall acceptability score, longer shelf life, lowest pH (3.49±0.05), lowest TSS (4.27±0.12 Brix %), and the highest vitamin C content (31.41±0.67 mg/100 ml) at the end of storage period. A slower increase in TA was noted for tomatoes in plastic containers with similar increase in TA across all packaging types by the end of the storage. Overall, there was a significant less variation in physiological weight loss, pH, TA, and vitamin C content between tomatoes packaged in LDPE bags and those in plastic containers. Therefore, it can be concluded that using LDPE bags for packaging tomatoes leads to a longer postharvest shelf life and improved phytochemical quality when stored at 20 °C. These findings demonstrate the importance of selecting appropriate packaging materials for the efficient storage of tomatoes, thus contributing to reduced postharvest losses and enhanced fruit quality.

Keywords: Packaging materials, Refrigeration, Shelf life, Tomato.