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Effect of different packaging and storage conditions on shelf-life of processed drumstick leaves

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ABSTRACT : Green leafy vegetables are common in the Indian diet. A variety of greens are consumed in different parts of the country. Leafy vegetables are highly perishable and their shelf life depends on duration and conditions of storage. In the view of the increasing demand for products with a fresh-like quality which are very nutritious and easily available in the local market, a research has been conducted to assess the quality of the drumstick leaves by using different packaging materials and methods under different storage conditions. Influence of packaging conditions on minimally processed drumstick leaves were studied during 12 days of storage at 5^0C. The pretreated drumstick leaves were packaged in Low density polyethylene (LDPE) and polypropylene materials of different thickness namely, 150, 250 and 350 gauges under normal ambient air and refrigerated condition and stored in ambient (25 ± 2^0 C), refrigerated (5 ± 2^0 C) temperatures with quality analysis under a day interval for twelve days. The results observed for different conditions with respect to the quality deterioration revealed that 350 gauge thick LDPE was found to be the best in maintaining the colour and the reduction in vitamin C content(150 mg/ 100 g), beta carotene content (4793 µg/100 g) was found to be less during the storage and it was also observed that the rate of increase in the microbial load *i.e.* fungi, bacteria was less with the values 2.96 x10^6 and 1.21 x10^4, respectively at the end of storage period

KEY WORDS : Packaging, Storage, Conditions, Shelf-life, Drumstick leaves

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Green leafy vegetables are fair source of pro vitamin A (carotene), ascorbic acid and potassium. These serve as a good source of water-soluble vitamins such as thiamin, riboflavin, nicotinic acid as well as minerals, calcium, phosphorus and iron. Green leafy vegetables are less expensive and easily available sources of micro nutrients. India is the second largest producer of green leaves next to China with an estimated production of 96 million tonnes. Drumstick tree *(Moringa oleifera)* is grown mainly in semi-arid, tropical and subtropical areas. It is considered as one of the most useful trees, as almost every part of the moringa tree is used for food or has some other beneficial property. India is the largest producer of moringa, with an annual production of 1.1 to 1.3 million tonnes of tender fruits from an area of 38000 ha. The leaves are highly nutritious, being a significant source of beta-carotene, vitamin C, protein, iron and potassium. Minimal processing gives additional value in terms of convenience and time saving. The minimally processed vegetables that are packaged in low density poly ethylene (LDPE) and poly propylene films which have thickness between 25 and 100 µm prevent weight loss by maintaining high humidity and prevention of moisture loss (Ati and Hotchkiss, 2002). Subadra *et al.* (1997) determined the retention and storage stability of beta-carotene in dehydrated drumstick leaves and the results have revealed that, the sulphiting in addition to blanching was more effective in the retention of beta-carotene immediately after dehydration Consumers always show inclination towards fresh green leafy vegetables, than their processed ones. There is also demand for this fresh product when available in a convenient and fully edible form. It is here that the concept of minimal processing has emerged to satisfy the demand of high quality products in terms of nutrients, cost efficiency and less energy utilization. Minimally processed product usually describes a fresh product in a conveniently peeled, cored or sliced form which is fully edible. In the view of above problems a research has been conducted to study the effect of different packaging materials on shelf life of minimally processed drumstick leaves under different storage condition for specified period of time and the results were observed and