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Effect of pre-treatments and drying methods on quality of dehydrated bitter gourd (*Mamordica charantia* L.) slices

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ABSTRACT

An investigation was conducted in the year 2004-05 to develop simple technologies for drying of bitter gourd that can be adopted by the farmers at field level. The results of the study indicated that osmotic dehydrated products dried under electric drier were found acceptable. Maximum recovery of 11.884 per cent, maximum rehydration ratio of 5.762, reconstitutability ratio of 0.683 were recorded in slices treated with three per cent brine + 0.1 per cent potassium metabisulphite, while highest chlorophyll content of 20.28 mg per 100 g was observed in slices treated with 0.5 per cent potassium metabisulphite, whereas minimum time for drying was recorded in untreated control.

Key words : Bitter gourd, Sun drying, Solar druing, Electric drying, Brining, Dehydration, Rehydration

Bitter gourd (*Mamordica charantia* L.), commonly known as Karela in Hindi is an important pharmaceutical vegetable crop grown in tropical and subtropical regions. It has good nutritional value with 2.19 g of protein, 4.29 g carbohydrate, 1.8 mg of iron, 250 IU of vitamin A and 88 mg of vitamin C per 100 g of edible portion (Aykroyd, 1963). Drying and canning are two methods employed to preserve it. Dried product is preferred because of advantages like reduced mass and lowers packaging requirements. They are also used in cooked, stuffed and fried forms. Because of its restricted availability only in harvesting season, perishable nature and development of rubbery texture, loss of bitterness and development of brown colour after dehydration, a study was undertaken to develop suitable process for dehydration.

MATERIALS AND METHODS

Healthy, tender, unripe bitter gourds were washed in clean tap water and cut into five mm thick slices manually with stainless steel knives. The slices of 0.5 kg per treatment per replication were subjected to various pre-treatments, *viz.*, T_1 – dipping in 0.5 per cent potassium metabisulphite, T_2 – 1.0 per cent calcium chloride, T_3 – 0.25 per cent citric acid, T_4 – 3 per cent brine + 0.1 per cent potassium metabisulphite for one hour and T_5 – untreated control. All the treated and untreated (control) bitter gourd slices were spread in a single layer on trays and placed in an electric tray drier. The drying temperature was maintained at 65±2^{0}C. Towards the end of drying, the temperature was reduced to 55±2^{0}C. In other two sets of experiment, the trays were kept for drying under the sun and solar drier. The dehydrated slices were analysed for physical and chemical parameters. Rehydration ratio of dehydrated bitter gourd slices was calculated as per the procedure given by Ranganna (1986). Reconstitutability ratio of the dehydrated bitter gourd slices was calculated by using the formula:

$$\text{Reconstitutability ratio} = \frac{\text{Rehydrated ratio}}{\text{Dehydrated ratio}}$$

Total chlorophyll content (mg/100 g) of dehydrated slices was determined by using the procedure given by Sadashiv and Manickam (1991). The non-enzymatic browning was determined by colorimetric method at 440 nm and expressed in terms of OD values (Srivastava and Sanjeevkumar, 1998).

Organoleptic evaluation of the dehydrated slices was conducted after deep frying in edible oil on a five point hedonic scale.

RESULTS AND DISCUSSION

Recovery percentage is an important parameter indicating yield of dehydrated product. In the present investigation, recovery of dehydrated bitter gourd was found significantly high in slices treated with three per cent brine + 0.1 per cent potassium metabisulphite