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EFFECT OF VARIOUS PRETREATMENTS ON QUALITY ATTRIBUTES OF DRIED TURNIP SLICES AFTER CONVECTIVE DRYING AND DURING STORAGE IN VARIOUS PACKAGING MATERIALS

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Abstract-Experiments were conducted to study the effect of various pretreatments on quality attributes of dried turnip slices after convective drying. Investigations were also carried out to evaluate the quality of dried slices before and after storage in various packaging materials. Turnip of uniform shape and size were sliced into thickness of 5 mm using food processor. Pretreatments namely, blanching, KMS (0.50%) and KMS (0.50%) plus citric acid (0.25%) were given to the samples prior to dehydration. Pretreated slices were dried in convective dryer at temperatures of 40, 50 and 60 °C. Dried slices were then packed in various packaging materials namely LDPE, PVC and HDPE pouches and stored at room temperature. Results of the revealed that slices pretreated with combination of KMS plus citric acid and dried at 40 °C yielded maximum rehydration ratio as compared to those of other pretreatments and drying temperatures. Minimum browning index was obtained in case of samples pretreated with combination of blanching, KMS and citric acid and dried at 40 °C temperature. Rehydration ratio and sensory score decreased while browning index increased with storage period irrespective of pretreatments, temperature and packaging materials.

Keywords: Convective drying, Pretreatments, Turnip, Packaging material

1. INTRODUCTION

The turnip (Brassica rapa L.) is a root vegetable and is one of the oldest cultivated vegetables that has been used for human expenditures since prehistoric times [1]. Turnip is said to be originated from Russia and Siberia. In the North- Western states of India, turnip is cultivated as winter vegetable and is very popular especially in Jammu and Kashmir, Punjab, Himachal Pradesh and western Uttar Pradesh. Golden Ball, Pusa Kanchan, White Globe, Snow Ball and Purple Top area the most common cultivators. It grows good in cool climates and can be stored several months after harvest [2]. The fleshy thickened underground portion of turnip is actually the hypocotyl, the colour and shape of which vary depending mainly on the cultivar. Its shape may vary from flat through globular to top shaped and long. Colour of the peel; above ground may be red, purple, white, yellow of green while the underground colour may be white or yellow. Turnip is used as salad, cooked or pickled. They have anticancer properties and are an excellent source of antioxidants [3]. It is a valuable source for magnesium and calcium salts that are important in the prevention of dangerous diseases like cancer. Also it is a major source of fiber [4]. Turnip is seasonal and available in abundant quantity in glut season. Being a high moisture content crop, deterioration in quality of these vegetables is quite fast. Therefore, the moisture content of vegetables should be reduced to such an extent that the microorganisms cannot grow and the keeping quality is enhanced. The preservation of vegetables by dehydration offers a unique challenge [5] and it may be considered as an alternative of low cost preservation process [6]. The main purpose of drying agricultural and fruits products is the decrease of their moisture content to a surface, which allows secure storage over an extended course. Another benefit of dried products is their minimized packaging need and lower shipping expense as a result of reduced weight [7]. However, the information on pretreatments of vegetables to be used for drying is scanty. So, present study was conducted to study the effect of various pretreatments on quality of slices after drying and during storage at room temperature after six months of storage in various packaging materials.

2. MATERIALS AND METHODS

2.1 Materials

Several materials viz. turnip, chemicals (potassium metabisulphite and citric acid) and packaging material such as Low density polyethylene (LDPE), polyvinyl chloride (PVC) and High density Polyethylene (HDPE) were required