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Storage behavior and cooking quality of potato varieties

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Abstract
Tubers of potato varieties were assessed for storage behaviour at room temperature. The maximum, minimum temperature and relative humidity during storage period ranged between 26 to 40 ^{0}C, 17-28 ^{0}C and 18 to 82% respectively. The lowest weight loss was recorded in variety Kufri Chipsona-2 followed by Kufri Sultej. Highest dry matter content was observed in Kufri Sutlej. The information from this study can be utilized for further research work for processing and value addition. This can help farmers to choose and cultivate potato varieties as per the demand.

Keywords: Potato, weight loss, tuber dry matter content, cooking quality

Introduction

Potato (*Solanuim tuberosum* L.) is a crop of major significance in human consumption ranking 4th in World after maize, rice and wheat. Potato was apparently introduced by British to Sudan in early twentieth century. Being a short duration crop, it produces more quantity of dry matter, edible energy and edible protein in lesser duration of time than cereals like rice and wheat. Potatoes are non fattening food and contain vitamins and minerals, as well as an assortment of photochemical, such as carotenoids and polyphenols. Nutritionally potato is best known for its carbohydrate content. It is a high quality vegetable cum food crop and used in preparing more than 100 types of recipes in India. Notably worldwide consumption of potato products has been on the increase indicating the need to pay more interest on consumer behaviour and innovations in the sector (Abong *et al*., 2011) [1]. Beside storage behaviour, texture is one of the most important quality attributes of potato tubers. It not only affects consumer preference, but it also influences the release of volatile flavour components during chewing. Solid or dry matter is highly correlated with texture. A mealy potato is dry and granular, while a waxy potato is moist and gummy. That means some varieties after cooking, are glistening in appearances feel more or less dry and granular on the tongue. These are characterized as mealy. On the other hand, varieties have a translucent appearance when cooked and feel wet and pasty on the tongue. These are characterized as soggy and waxy Storage conditions are very specific for potatoes intended for processing where a low and uniform content of reducing sugars is required. The technique for production of flour on the small scale is very simple and cheap which require no costly machinery and utilizes solar energy for drying. Traditionally solar drying has been used as a method of preserving foodstuffs (Kolawole *et al.*, 2011) [5]. In Jammu and Kashmir also farmers have taken up potato cultivation and they face the same problem of disposal of produce during the peak harvesting period. Processing and value addition of potato in the state is almost negligible. The short shelf life of the product necessitates finding out suitable treatments and packaging materials possessing higher storage stability, so as to increase the market potential of the product. Thus before proceeding for product development, the quality of available cultivar must be evaluated to suit the desired product characteristic.

Material and Method

The present investigation was carried out in the Division of FST, Sher-e-Kashmir University of Agricultural Sciences and Technology. Medium sized matured tubers of potato cultivars, harvested in the mid of February were procured from the State Department of Agriculture. The potatoes were kept at room temperature (26-40 ^{0}C and RH 59-82%) to assess their storage life. The cultivar having optimum quality characteristics for processing into flour were selected.

Physiological weight loss of potato tubers each of cultivar was observed at ambient condition and the results were expressed as per cent on fresh weight basis (AOAC, 2002) [2].

Moisture Content: Moisture content: The moisture content of the products was obtained by standard analytical methods (AOAC, 2002) [2]. Triplicate samples (5 g) were weighed in aluminum dishes and oven dried at 105 °C to constant weight. Loss of weight due to drying was converted to percent moisture content.

Dry Matter Content: Dry matter content was estimated by drying weighed (5g) sample to a constant weight in hot air oven at 65 ^{0}C for 7 hours. Dried samples were cooled at room temperature in desiccators prior to weighing (AOAC, 2002) [2].

Results and discussion

While studying the effect of storage on potato tubers of different cultivars at ambient temperature, it was observed that the physiological weight in loss increased during storage. The increase in physiological weight in loss might be due to spoilage, sprouting as well as loss of moisture from tubers by transpiration and respiration. This is in conformity with the results of Mehta and Kaul (1987) [6] and Kazami *et al*., (2001) [4].

Kufri Sutlej had the highest dry matter content and Kufri Ashoka had the lowest. During storage dry matter content increased and it might be due to loss of moisture by transpiration and respiration. Similar observations were recorded by Beerah *et al.*, 1990) [3]. The moisture content was highest in Kufri Anand and the lowest in Kufri Chipsona-2. The decrease in moisture content during storage might be attributed to transpiration and respiration losses.

Table 1: Effect of storage period on physiological loss in weight (%) of different potato cultivars.

Treatments	Storage period (days)			
	0	20	40	Mean
Kufri Anand	-	7.40	14.50	10.95
Kufri Pukhraj	-	6.15	9.11	7.63
Kufri Ashoka	-	7.18	10.17	8.67
Kufri Sutlej	-	5.98	9.10	7.54
Kufri Jawahar	-	6.15	9.00	7.57
Kufri Chipsona-2	-	5.42	8.17	6.79
Mean	-	6.38	10.00	
CD (0.05)				
Cultivars	0.15			
Storage period	0.08			
Cultivars x Storage	0.01			

Table 2: Effect of storage period on moisture content (%) of different potato cultivars.

Treatments	Storage period (days)			
	0	40	60	Mean
KufriAnand	84.40	79.63	77.10	80.26
KufriPukhraj	83.77	81.37	72.79	79.31
KufriAshoka	84.06	82.37	76.57	81.00
Kufri Sutlej	81.24	79.98	73.42	78.21
KufriJawahar	79.57	77.46	72.50	76.51
Kufri Chipsona-2	77.42	75.76	72.33	75.17
Mean	81.74	79.43	74.12	
CD (0.05)				
Cultivars	0.19			
Storage period	0.66			
Cultivars x Storage	0.01			

Table 3: Effect of storage period on Dry matter content (%) of different potato cultivars

Treatments	Storage period (days)			
	0	30	60	Mean
KufriAnand	18.00	17.80	15.20	17.00
KufriPukhraj	18.00	17.02	14.49	16.50
KufriAshoka	17.91	15.22	13.33	15.49
Kufri Sutlej	23.49	19.09	14.06	18.88
KufriJawahar	21.67	18.76	14.78	18.40
Kufri Chipsona-2	22.24	19.89	14.39	18.84
Mean	20.22	17.96	14.83	
CD (0.05)				
Cultivars	0.16			
Storage period	0.42			
Cultivars x Storage	0.70			

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