

PHYSICAL CHARACTERISTICS AND ASCORBIC ACID CONCENTRATION OF ROSEHIPS FOUND IN DIFFERENT LOCALITIES OF MURREE HILLS

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ABSTRACT

Variation in physical characteristics and ascorbic acid (vitamin C) concentration of rosehips collected from various localities of Murree Hills was determined at different harvest time, site of collection and storage time. Concentration of Vitamin C was found in the range of 2000-2500 mg/100g. Rosehips possessed fruit weight (4.3 to 6.2gm), seed weight (2.3 to 3.3gm), pulp weight (2.0 to 2.8gm), pulp seed ratio (0.66 to 0.86), average length (10.14 to 15.33mm) and average diameter (8.5 to 10.25mm). Vitamin C concentration increased from October to November followed by gradual decrease from the month of November to February (22.45%). Samples stored at room temperature showed rapid reduction in Vitamin C (24.49%) and those stored under controlled conditions (25°C and 50% RH) showed slight reduction (6.49%).

INTRODUCTION

In Pakistan, wild rose scantily found in Murree and surrounding areas in association with *Pinus wallichiana* at an altitude ranging from 900-2300 m. It is a shrub with single white 5 cm flowers blooming on new growth. Rosehips begin to form in spring, and ripen in late summer through autumn. The bright red fruits range from 10mm to 20mm long and are attractive. Many wild species of roses are endemic to Pakistan, especially in the northern areas, which if improved through conventional breeding or advanced molecular techniques, can have great economic value for the people of the area, where farmers have small land holdings of less than 1 hectare and rely on conventional agriculture for their livelihood (Landrein et al., 2009).

Rosehips are the seedpods formed after the blooming. The hips most commonly used in foods and beverages are harvested from wild roses. Rosehips are bright orange, oval shaped and become flashy but are not true fruits. Rosehips can be used fresh, dried or preserved. The fruit is a very rich source of vitamins and minerals, especially in vitamins A, C and E, flavanoids and other bio-active compounds. This rose can be used for several purposes, also has a unique flavor (Werlemark *et al.*, 1995). Tea and marmalade can be made from the vitamin C rich hips; their vitamin C content varies with the site of collection, plant species, and harvest date and dehydration methods (Ercisli, 1996). The good taste of the fruits enables multiple uses for processing, also mixed with other fruits for marmalade, jam, juices, mixed beverages and syrup (Werlemark, 2003).

The present study aims at determining the variation in physical characteristics i.e. fruit weight, seed weight, pulp weight, pulp-seed ratio, length and diameter of rosehip and ascorbic acid (vitamin C) concentration with harvest time, site of collection and storage time of rosehip collected from different localities of Murree Hills.

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MATERIAL AND METHOD

Rosehip's samples were collected from bushes of wild rose from different localities of Murree Hills; four sites of Ghora Gali, two sites of Lower topa, four sites of Bhurban, and only one site each of Patriata, Kotli Sattian, Sozo Park, Danoi and Glehra Gali at an altitude ranging from 1000-2000 m in the first week of October, November, December, January and February of 2009-2010.

Rosehips were immediately packed in polythene bags to avoid moisture loss and brought to Pakistan Forest Institute, Peshawar for further processing in the Forest Chemistry labs.

The samples were evaluated for average weight of rosehips, pulp/seed ratio, diameter & length and concentration of Vitamin C.

Average weight of Rosehip

From each sample two sets of twenty hips were selected randomly and were weighed separately and average weight was calculated for each sample.

Pulp/seed ratio of Rosehips

Twenty hips from each sample were selected and then separated into their seeds and pulp. Seeds and pulp were weighed separately and Pulp/ seed ratio was calculated.

Diameter and length of rose hips

Twenty hips were used to measure length and diameter and average length and diameter were calculated.

Estimation of Vitamin C

Vitamin C content of each sample of 100 rosehips was determined according to AOAC (1969).

RESULTS AND DISCUSSION

Effect of locality on Physical characteristics

Table 1 shows average values of fruit weight, seed weight, pulp weight, pulp seed ratio, length and diameter. Results indicated that variation of the properties among and within localities. The variation in the properties may be due to difference in altitude, climate or nature of soil.

Table 1. Physical properties of rosehip samples collected from different locations

S.No	Locality	Fruit Weight (gm)	Seed weight/ (gm)	Pulp weight (gm)	Pulp seed ratio	Avg. length (mm)	Avg. diameter (mm)
1.	Patriata	6.1	3.3	2.8	0.84	12.61	8.58
2.	Gulehra Gali	6.9	3.8	3.0	0.82	15.33	10.68
3.	Sozo park	6.2	3.3	2.9	0.86	12.15	7.70
4.	Kotli sattian	6.9	3.8	3.3	0.82	12.88	8.50
5	Danoi	6.8	3.8	3.0	0.72	13.33	8.40
6.	Ghora Gali 1	5.5	3.3	2.2	0.66	11.18	8.49
7.	Ghora Gali 2	4.7	2.8	1.9	0.67	12.65	9.13
8	Ghora Gali 3	6.4	3.6	2.9	0.81	10.76	8.68
9.	Ghora Gali 4	4.2	2.3	1.9	0.86	10.15	7.86
10	Bhurban 1	7.0	4.3	3.8	0.84	11.61	9.58
11.	Bhurban 2	7.4	4.3	3.2	0.66	12.18	7.49
12.	Bhurban 3	7.2	3.9	3.5	0.69	12.05	9.72
13.	Bhurban 4	6.6	3.8	2.9	0.67	11.65	8.13
14.	Lower Topa 1	5.4	2.9	2.5	0.69	11.05	8.72
15.	Lower Topa 2	8.6	4.6	3.9	0.80	12.76	9.68

Effect of locality on Vitamin C concentration

Table 2 shows average values of Vitamin C concentration collected from each locality. Samples collected from Bhurban-4 had highest average concentration of Vitamin C (3000mg/100g), and minimum concentration was found in the samples from Danoi and Glehra Gali that was 835 and 840mg/100g respectively. Higher concentration of Vitamin C was also present in the samples from some sites of Patriata and Ghora Gali which was 2450mg/100g and 2494mg/100g respectively. Rosehips collected from other sites had varying concentration of vitamin C which ranged from 1156 mg/100g – 2494 mg/100g.

Table 2. Concentration of Vitamin C of Rosehip samples collected from different locations

Sample No.	Locality	Conc. of Vitamin C (mg/100g)
1	Patriata	2450
2	Gulehra Gali	840
3	Sozo park	1725
4	Kotli Sattian	1156
5	Danoi	835
6	Ghora Gali 1	1322
7	Ghora Gali 2	1319
8	Ghora Gali 3	1816
9	Ghora Gali 4	2494
10	Bhurban 1	1146
11	Bhurban 2	1824
12	Bhurban 3	2700
13	Bhurban 4	3000
14	Lower Topa 1	1128
15.	Lower Topa 2	1169

Effect of harvest time on Vitamin C concentration

In order to find out the effect of harvest time on Vitamin C concentration, the samples of rosehip were harvested from October to February. Vitamin C concentration was determined. Results indicated that the concentration of Vitamin C increased from October to November and decreased in the months of December, January and February. Increasing and decreasing trend with harvest time has been shown in Fig 1.

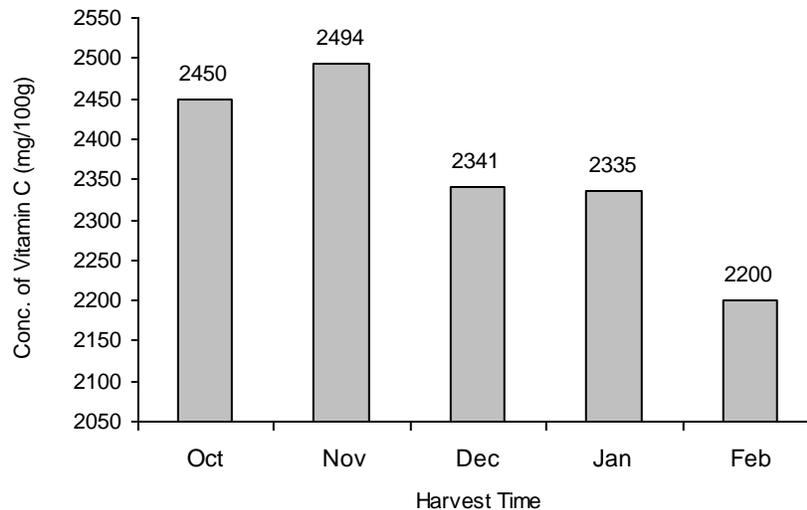


Fig. 1. Variation in Vitamin C concentration with harvest time

Effect of storage time on Vitamin C concentration

The samples were divided into two batches. One batch was stored at room temperature and the other under controlled conditions at 25°C and 50% relative humidity (R.H) for the period of five months. Vitamin C concentration was determined from October to February. Results indicated reduction in Vitamin C concentration with the passage of storage time. Samples stored at room temperature showed rapid reduction in vitamin C concentration where as those placed under controlled conditions showed slight reduction as shown in Fig.2.

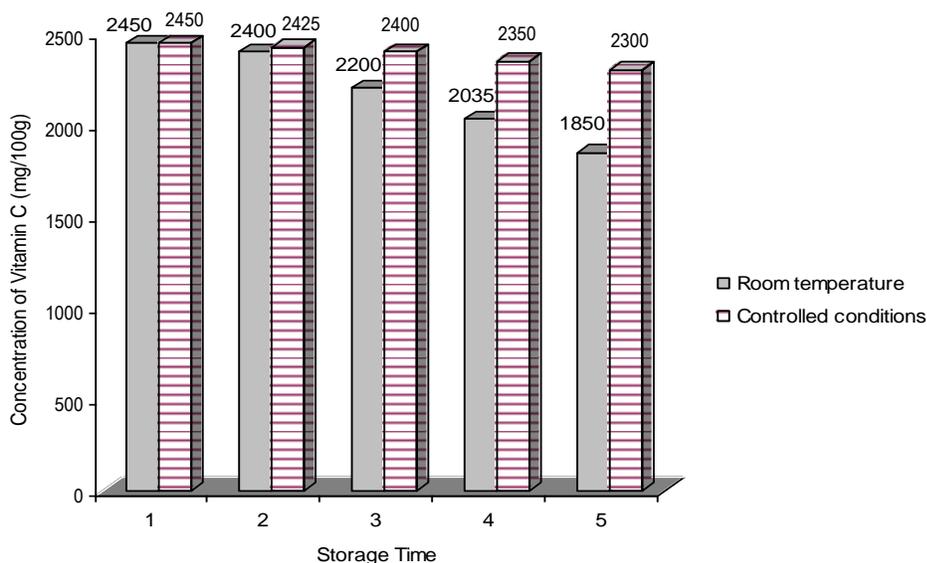


Fig. 2. Variation of Vitamin C concentration with storage time

REFERENCES

Association of Official Analytical Chemist, 1969. Ascorbic acid official method, In: Official Methods of Analysis of AOAC. P. 838.

Ercisli, S. 1996. Selection and propagation of rose hips are naturally grown in gumushane district. PhD Thesis, Ataturk University, Erzurum, p. 167.

Landrein, S., Dorosova, K., Osborni, J. 2009. Rosaceae (I)-Potentilleae & Roseae. In *Flora of Pakistan* (Eds Ali SI, Qaiser M) University of Karachi, Pakistan and Missouri Botanical Press. St. Louis, Missouri, USA.

Werlemark, G., 2003. The *Rosa canina* case, Enc. Rose Science sarticleid: ROSE-000435.

Werlemark, G., Charlson, U., Ugglä M., and Nyboom, H. 1995. Effects of temperature treatments on seeding emergence in dog roses, *Rosa Sect Caninae* (L.) Acta Agric. Scand. Section B, Soil and Plant 45, pp. 278–282.