



Effect of Soda Oil Dip Method of Raisin making on Recovery and Keeping Quality of Seedless Grape Varieties

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ABSTRACT

Seven commercial varieties of grapes were evaluated to study the effect of soda oil dip method of raisin making on recovery and keeping quality of seedless grape varieties. The raisins prepared from these varieties contained 13.61 to 16.23 per cent moisture, 56.23 to 79.36° Brix (T.S.S), 2.09 to 3.13 per cent acidity, 18.82 to 24.88 mg/100g ascorbic acid, 58.75 to 66.57 total sugars and 56.33 to 62.81 reducing sugars. The sensory score out of 5 for overall acceptability ranged from 1.76 to 3.95. Among these cultivars, Manik Chaman followed by Thompson seedless and A18/3 were found to be superior to others in raisin making on recovery and keeping quality by soda oil dip method.

Key words : Raisins, Dip method, Seedless grape, Varieties.

Grape (*Vitis vinifera* L.) is one of the most important horticultural crop. It is the second most important crop after mango for exporting to other countries. Grapes and raisins help to restore human health. Processed products prepared are juice, crush, jelly, canned grapes etc. During seasonal glut, due to considerable reduction in the market price, the farmers go for the preparation of raisins from the excess produce. However, the quality of such raisins is poor and inferior to those imported from countries like Afghanistan, Iran and Australia. Raisin making is one method for preserving the grapes. No preservatives are used to keep them fresh. They improve digestion, lower the blood pressure and keep blood healthy. Raisins lubricate the body channels, particularly the lungs. Raisins contain most of the nutrients present in fresh grapes (Winkler, 1962). Raisins contain a type of iron called heme iron, hard for the body to absorb than the heme iron found in meat. Eating raisins along with foods high in vitamin C will help in absorption of non heme iron. It was therefore proposed to study the effect of soda oil dip method of raisin making on recovery and keeping quality of seedless grape varieties.

MATERIAL AND METHODS

Grape bunches with fully matured berries of seven varieties were collected during March 2010

from grape garden viz. Grape Research Station, Rajendranagar, Hyderabad. The varieties are Fantasy seedless, Crimson seedless, A17-3, A18/3, K.R.White, Manik Chaman, and Thompson seedless. The raisins were prepared in triplicate sets by using soda oil dip method. All diseased, cracked, malformed and discoloured berries were sorted out and discarded. The berries were thoroughly washed under running water for removal of adhering dust and foreign matter. A solution containing 4.5 per cent potassium carbonate, 0.5 per cent sodium carbonate and 1.0 per cent preyal dipping oil (ethyl oleate) was prepared and grapes were dipped in the solution for 5 min. They were then dried in a shade till moisture content was reduced to about 15 per cent.

The fresh grape berries as well as raisins prepared from different varieties were analyzed for the content of total sugars, reducing sugars, non-reducing sugars and acidity using standard procedures. Ascorbic acid was determined by using 2, 6-dichlorophenol indophenol dye. The raisins were evaluated for sensory properties by a panel of 10 judges on a 5 points scale card according to the method of Adsule *et al*, 2008. The data were analyzed for the statistical significance according to the procedure given by Panse and Sukhatme (1985).

Table 1. Physico-chemical characteristics of fresh grapes of different varieties before raisin making.

Varieties	Berry colour	Shape of the berry	Avg. weight of bunch (g)	Avg. berry weight (g)	Berry diameter (mm)	TSS (°Brix)	Acidity (%)	Ascorbic acid (mg/100g)	Total sugars (%)	Reducing sugars (%)	Non reducing Sugars (%)
T ₁ – Fantasy seedless	Black	Round to ovoid	171.33	1.88	14.40	20.53	0.54	1.30	20.07	19.58	0.49
T ₂ – Crimson seedless	Reddish	Round	151.66	1.84	16.66	21.00	0.62	1.23	19.60	17.66	1.94
T ₃ – A 17-3	Yellow colour	Round to ovoid	126.00	1.70	14.33	20.26	0.71	1.20	18.46	17.31	1.15
T ₄ K.R.White	Greenish yellow	Ovoid	164.00	1.70	15.33	20.76	0.59	1.20	19.71	17.88	1.82
T ₅ – A 18/3	Black	Round	321.33	2.16	14.66	20.96	0.68	1.23	19.81	17.45	2.35
T ₆ – Manik chaman	Greenish yellow	Ovoid elongated	344.66	2.26	17.66	23.43	0.47	1.23	21.42	19.65	1.77
T ₇ – Thompson seedless	Yellowish green to yellow	Ovoid elongated	201.00	2.31	16.66	22.36	0.52	1.30	20.12	18.38	1.73
Mean			211.42	1.98	15.67	21.32	0.59	1.24	19.88	18.27	1.60
SE m ±			24.99	0.08	1.48	0.38	0.006	0.04	0.11	0.02	0.11
CD at 5 %			75.80	0.25	N.S	1.18	0.019	0.14	0.34	0.08	0.35

Table 2. Effect of soda oil dip method on physico-chemical composition of raisins.

Varieties	Recovery of raisins (%)	Avg. weight of raisins (g)	Moisture (%)	TSS (°Brix)	Acidity (%)	Ascorbic acid (mg/100g)	Total sugars (%)	Reducing sugars (%)	Non reducing sugars (%)
T ₁ – Fantasy seedless	22.73	0.42	15.21	61.76	2.67	19.90	65.05	62.20	2.84
T ₂ – Crimson seedless	22.48	0.41	14.94	64.76	2.50	19.80	64.42	61.98	2.44
T ₃ – A 17-3	20.85	0.38	13.61	56.20	3.13	18.82	58.75	56.33	2.42
T ₄ – K.R. White	22.46	0.43	15.53	61.86	2.59	20.45	64.76	62.26	2.56
T ₅ – A 18/3	21.97	0.45	14.86	61.30	2.85	22.08	64.86	62.67	2.59
T ₆ – Manik chaman	24.60	0.46	16.23	79.36	2.09	23.26	66.57	62.81	3.76
T ₇ – Thompson seedless	22.19	0.43	14.61	68.10	2.32	24.88	65.08	62.79	2.29
Mean	22.47	0.42	15.00	64.76	2.59	21.31	64.21	61.57	2.70
SE m ±	0.44	0.01	0.18	2.13	0.12	0.57	0.81	0.92	0.60
CD at 5 %	1.35	0.04	0.56	6.47	0.36	1.73	2.47	2.81	1.71

Table 3. Effect of soda oil dip method of raisins during storage period.

Varieties	Avg weight of raisins (g)	Moisture (%)	TSS (°Brix)	Acidity (%)	Ascorbic acid (mg/100g)	Total sugars (%)	Reducing sugars (%)	Non reducing sugars (%)	Moulds damage (%)
T ₁ – Fantasy seedless	0.33	14.73	63.63	2.26	19.96	66.11	62.82	3.29	9.00
T ₂ – Crimson seedless	0.32	14.15	65.96	1.61	19.37	65.46	62.03	3.42	11.00
T ₃ – A 17-3	0.30	13.53	58.16	2.33	18.70	60.11	56.71	3.40	16.00
T ₄ – K.R. White	0.34	15.23	64.40	2.19	20.20	65.46	62.28	3.18	5.00
T ₅ – A 18/3	0.35	14.63	63.30	2.32	21.68	65.88	62.69	3.19	7.00
T ₆ – Manik chaman	0.38	16.21	81.30	1.24	24.75	67.22	62.90	4.20	7.00
T ₇ – Thompson seedless	0.36	13.77	70.46	1.50	23.14	66.07	62.88	3.19	5.00
Mean	0.34	14.59	66.74	1.92	21.11	65.18	61.76	3.41	8.5
SE m ±	0.006	0.16	1.86	0.17	0.63	1.11	0.83	0.55	1.14
CD at 5 %	0.019	0.49	5.66	0.52	1.93	3.38	2.52	1.69	3.46

Table 4. Organoleptic evaluation of raisin at 120 days by soda oil dip method in different varieties.

Varieties	Colour and appearance	Texture	Flavour	Taste	Overall acceptability
T ₁ – Fantasy seedless	2.53	2.29	2.07	2.23	2.10
T ₂ – Crimson seedless	2.51	2.34	2.10	2.21	2.21
T ₃ – A 17-3	2.45	2.23	1.88	1.96	1.76
T ₄ – K.R. White	2.47	2.31	2.02	2.25	2.06
T ₅ – A 18/3	3.63	2.37	2.11	2.36	2.21
T ₆ – Manik chaman	4.00	3.75	4.02	4.00	3.95
T ₇ – Thompson seedless	3.20	2.41	2.29	2.54	2.44
Mean	2.97	2.52	2.35	2.50	2.39
SE m ±	0.17	0.18	0.13	0.22	0.10
CD at 5 %	0.61	0.45	0.29	0.60	0.23

RESULTS AND DISCUSSION

The berries of seven grape varieties used in the present investigation contained 20.26 (A17-3) to 23.43° Brix (Manik Chaman) total soluble solids and (0.47%) (Manik Chaman) to 0.71 (A17-3) acidity (Table 1). The content of total, reducing and non-reducing sugars ranged from 18.46 (A17-3) to 21.42 (Manik Chaman) per cent, 17.31 (A17-3) to 19.65 (Manik chaman) per cent and 0.49

(Fantasy Seedless) to 2.35 (A18/3). These values are comparable to those reported by earlier workers (Adsule *et al.*, 2008; Doreyappa Gowda., 1998; Mane *et al.*, 2003).

The moisture content of raisins prepared from different varieties varied from 13.61 (A17-3) to 16.23 per cent (Manik chaman) (Table 2). The raisins have been reported to contain 12 to 22 per cent moisture (Kulkarni *et al.*, 1986). The TSS in

raisins ranged from 56.20 (A17-3) to 79.36° Brix (Manik Chaman). The raisins prepared from different cultivars contained 58.75 to 66.57 per cent total sugars, 56.33 to 2.81 per cent reducing sugars and 2.42 to 3.76 per cent non reducing sugars. The maximum total and non reducing sugars contents were observed in raisins of Manik Chaman variety followed by Thompson seedless. The titratable acidity of raisins ranged from 3.13 to 2.09 per cent. Vitamin C content in Manik Chaman was significantly higher than all other varieties. It ranged from 18.82 to 24.88 mg per 100 g raisins.

The moisture content of stored raisins at 120 days ranged from 13.53 (A17-3) to 16.12 (Manik chaman) per cent (Table 3). The total soluble solids ranged from 58.16 (A17-3) to 81.30° Brix (Manik chaman). The acidity of raisins during storage ranged from 2.33 (A17-3) to 1.24 (Manik chaman) per cent. The ascorbic acid content of stored raisins ranged from 18.70 (A17-3) to 24.75 (Manik chaman) mg/100g (Mapson 1970). The total, reducing and non reducing sugars content of stored raisins ranged from 60.11 (A17-3) to 67.22 (Manik chaman), 56.71(A17-3) to 62.90 (Manik chaman), 3.18 (K.R. White) to 4.20 (Manik chaman) respectively. The values reported in present investigation are in the range of earlier reports (Singh *et al.*, 1974). The mould damage was observed maximum in the variety A17-3 (16.00) and minimum was recorded in the variety Thompson Seedless (5.00).

The mean scores for colour and appearance of raisins prepared from different varieties ranged from 2.45 (A17-3) to 4.00 (Manik Chaman), while that for texture ranged from 2.23 (A 17-3) to 3.75 (Manik Chaman) (Table 4). The scores for flavour and taste were more for raisins obtained from Manik Chaman followed by Thompson seedless. The overall acceptability score was found to be maximum in case of raisins prepared from Manik chaman (3.95), followed by

Thompson seedless (2.44), Crimson seedless and A18/3 (2.21), Fantasy seedless (2.10), K.R.White (2.06), A17-3 (1.76). Considering both the chemical composition and sensory properties, the results obtained in present investigation indicated that the raisins prepared from Manik Chaman, Thompson seedless and A18/3 was superior to those prepared from other varieties.

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