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Chemical and Organoleptic Evaluation of Strawberry Cultivar Grown under Plastic Green House

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Abstract

Strawberry cultivars viz; Tioga, Humigent, Peshawar local, Gorella, Bell Rubi, Turft, Sequoia, German Origin, W-72110, Countlet, Korona and Chandler were cultivated in a plastic green house and their performance for acidity, total soluble solids and ascorbic acid was evaluated. Under green house conditions Korona have maximum acidity (1.440 %) while Turft have least acidity (0.704 %). Chandler cultivar have maximum Total Soluble Solids contents (10.7) where as Korona have least (8.63) total soluble solid contents. Ascorbic acid contents of Korona were maximum (104.46 mg/100 gm) where as German Origin have least (80.99 mg/100 gm) of ascorbic acid. Organoleptically Turft, Chandler and Red Countlet leads all off season cultivars.

Introduction

Strawberry belongs to family Rosaceae. Various wild species of strawberry are grown all over the world. But cultivated strawberry belongs to two species viz; *Fragaria vesicaria* and *Fragaria virginiana*. In Pakistan commercial cultivation of strawberry is rare, and there are people who have not even seen this fruit. There are some hilly areas in the F.P. like Swat and Hazara, where this species is cultivated on small scale, but some varieties can be grown even in sub-tropical conditions. From nutritional point of view 100 gm. of fruit contain 59 mg. vitamin C., 0.70 mg. protein, 60 mg. vitamin A, 21 mg. calcium, 21 mg. phosphorus and 164 mg potassium etc. (Bernice *et al.*, 1963). The fruit contain very low amount of sugar. Due to its nutritive value, the fruit is consumed in a variety of ways. It is eaten fresh as well as in canned or preserved form. It is also used in different medicines and cosmetics. Maskevopoulou *et al.* (1991) noted the performance of different strawberry cultivars namely Brighton, Douglas, Fern, Toro and Toro under plastic green house. Brighton and Toro had the highest percentage of total soluble solids and Toro the lowest acidity. Reitmerier and Nonnecke (1991) compared five neutral strawberry varieties i.e. Tristar, Countlet, Mark, Volo and Selevo. Tristar and Tribute fruits were red and more sour, juicy and had higher titratable acidity than fruits of other day neutral cultivars.

Materials and Methods

The study was conducted under the plastic tunnel at Agricultural Bio-Technology Center and Food Technology Department Agricultural Research Institute, Tarnab, Peshawar, during the year 1995-96. Fruits from twelve cultivars of strawberry namely Tioga, Humigent, Peshawar local, Gorella, Bell Rubi, Turfts, Sequoia, German Origin, W-72110, Red Countlet, Korona and Chandler were collected and analyzed chemically and organoleptically. Following procedures were adopted for carrying out the research work detailed below:-

A. Chemical Analysis

For chemical analysis fruits were selected from each species randomly. Juice was extracted and samples were analyzed for the following.

Titratable Acidity: 10 ml. of the juice from each sample was taken and diluted with distilled water to make the volume 100 ml. 10 ml sample was taken and titrated against N/10 NaOH using 2 to 3 drops phenolphthaleine as indicator (Hortwitz, 1960). The results were expressed in percentage.

Total soluble solids: Total soluble solids were directly observed by using hand refractometer as described by Hortwitz, 1960.

Ascorbic Acid: Indophenol titration method of Ruck (1961) was employed to determine ascorbic acid contents.

B. Organoleptic evaluation

A hedonic test was conducted to determine consumers degree of liking and disliking for 12 varieties (Treatments) of strawberry using 9 point category scale (Larmond, 1977).

Results and Discussion

Titratable Acidity: The data recorded for titratable acidity is presented in column I of the table, which showed a significant difference in the percent acidity of different strawberry cultivars. It is evident from the table that higher percent acidity (1.91%) was observed in Korona. This was followed by Humigents (1.351%) and Belrubis (1.293%). Both these cultivars are statistically at par with each other. The least percent acidity of 0.8350 percent was observed in Turft. Reitmerier and Nonnecke (1991) also concluded similar results.

Total soluble solids: Data pertaining to total soluble solids is presented in column II of the table, revealed a clear

Table 1: Per cent acidity, total soluble solids Organoleptic and Vit.C.(mg/100 gm) contents of different strawberry cultivars under plastic tunnel conditions.

S.No	Cultivars	% Acidity	T.S.S. (Brix)	Organ. Evalu.	Vit.C. mg/100 gm.
1.	Tioga	1.6200 EF	9.33 CDE	3.60 F	90.84 BC
2.	Humigent	1.3510 AB	9.40 CD	3.20 E	95.56 B
3.	Peshawar Local	1.0140 F	9.40 CD	5.20 C	87.10 CD
4.	Gorella	1.2800 BC	9.03 EF	4.02 D	91.58 BC
5.	Belrubi	1.2930 AB	9.56 C	5.60 C	87.31 CD
6.	Turft	0.8350 G	9.50 C	7.20 A	81.32 E
7.	Sequoia	1.1470 DE	9.16 DEF	5.20 C	83.76 DE
8.	German Origin	1.0067 F	9.00 F	4.40 D	91.00 E
9.	W-72110	1.1470 DE	9.03 EF	4.20 D	87.25 CD
10.	Red Countlet	1.1780 CD	10.27 B	6.60 B	89.35 C
11.	Korona	1.3910 A	8.63 G	2.80 EF	104.50 A
12.	Chandler	1.0150 F	10.70 A	7.20 A	82.69 DE
LSD Value		0.1029	0.3088	0.63 F	5.403

Mean followed by different letters are significantly different from each other at 1% level of significance.

difference in the total soluble solid contents of strawberry cultivars. It appears from the table, that Chandler had exceeded other cultivars significantly, where total soluble solids of 10.7 were noted. This was followed by Red Countlet (10.3). Gorella and Belrubi which were statistically identical and resulted in 9.6 and 9.5 total soluble solid contents respectively. Minimum total soluble solids of 9.0 was analyzed in German Origin. In 1991, Paraskevopoule *et al.* reported similar results.

Ascorbic Acid: Ascorbic acid contents of the different cultivars are presented in column IV of the table. It is observed from table that cultivar Korna contain maximum (104.5 mg/100 gm) amount of vitamin C., surpassing other cultivars. This was followed by Humigents (95.95 mg/100 gm) which secured better vitamin C. contents than the remaining cultivars. The other groups of cultivar were similar like Tioga (90.84 mg/100 gm), Gorella (91.58 mg/100 gm), Peshawar local (87.10 mg/100 gm) Belrobi (87.31 mg/100 gm) and W-72110 (87.25 mg/100 gm). The cultivars which showed the least quantity of vitamin C., were German Origin (81.00 mg/100 gm) and Turft (81.32 mg/100 gm). Both of them are equal from statistical point of view.

Organoleptical evaluation: Organoleptic evaluation score is presented in column III of the table, indicate that Turft, Chandler and Red Countlet were liked much as compared to all others, followed by Belrubi, Sequoia and Peshawar Local. Korona specie got lowest position in the ranking.

From the present observations it can be concluded that Korona have the highest ratio of titratable acidity and ascorbic acid contents, where as highest ratio of total soluble solids were observed in Chandler which also got highest score organoleptically.

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