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Performance of Strawberry (*Fragaria* x *ananassa* Duch.) Genotypes for Yield and Quality Parameters

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A B S T R A C T

The present investigation was carried out with 5 genotypes *viz.*, Winter Dawn, Sweet Charlie, Gili, Barak and Crystal. The experiment was laid out in Randomized complete block design at College of Horticulture, Mysore during 2016-2017. The results revealed that, the number of fruits per plant (22.25) and fruit length (39.64 mm) was recorded maximum in genotype Gili. Highest fruit weight (15.21 g) and fruit girth (29.40 cm) was noticed in genotype Crystal. The fruit quality parameters like total soluble solids (9.50 °Brix), reducing sugars (7.01 %), non-reducing sugars (2.30 %) and total sugars (9.40 %) was maximum in genotype Barak. Sugar acid ratio was maximum (24.65) in genotype Crystal. Maximum and minimum titratable acidity (0.54 % and 0.31%) was recorded in genotypes Gili and Crystal respectively. Among the different genotypes evaluated the Crystal accounted maximum for yield and quality parameters of strawberry.

Introduction

Strawberry (*Fragaria* x *ananassa* Duch) is a native of France and belongs to the family Rosaceae. All cultivated varieties are octaploid (2n=56). Botanically it is an aggregate fruit which is highly perishable in nature. In temperate climatic condition, its plants behave like a small perennial herb (Finn and Strike, 2008) with shallow root system whereas in sub-tropical climate it behaves as annuals. Owing to its medicinal properties (anti-carcinogenic, anti-diabetic and anti-oxidant), strawberry is gaining popularity among all age group consumers (Asrey Ram and Patel, 2003). Strawberries are good source of natural anti-oxidant (Wang *et al.*, 1996 and Heinonen *et al.*, 1998), carotenoids, vitamins, phenols, flavonoids, dietary glutathionone and metabolites (Larson, 1988). Strawberry is an herbaceous perennial short day plant. It was first introduced by the NBPGR Regional Research Station, Shimla (Himachal Pradesh) in the early sixties. Strawberry is highly nutritious fruit. The fruit contain fair amounts of iron, anticancer compound called ellagic acid, vitamin C and vitamin A (60 IU/100 g of edible portion). Higher pectin contains (0.55%) in the form of calcium pectate serves as an excellent ingredient for making jelly. In addition to fresh consumption, the

strawberry is in special demand by the fruit processing units for preparing jam, ice-cream, syrup, quick freezing and canning. Being a rich source of vitamins and minerals coupled with delicate flavour, Strawberry has now become an important table fruit of millions of people around the world (Sharma and Singh, 1990). Basically the crop is suited to cool weather conditions. The study is conducted with an objective of finding the performance of different genotypes for yield and quality in southern dry zone of Karnataka under shade house conditions at College of Horticulture, Mysore.

Materials and Methods

Five genotypes of strawberry were evaluated for their feasibility for yield and quality under southern dry zone situations under shade house by adopting randomized block design with four replications during 2016-17. The genotypes include Winter Dawn, Sweet Charlie, Gili, Barak, and Crystal. The plot size for each treatment was 4.5 m x 0.6m, recommended package of practices were followed uniformly in all the treatments. Healthy tissue culture plants were transplanted on raised bed with two rows apart 50cm. Planting distance was 30cm. Mulching was done by black polythene mulch sheet and irrigation was provided by drip method. Observations on morphological characters were recorded on 10 randomly selected plants in each treatment. The data were subjected to statistical analysis following standard procedures (Panse and Sukhatme, 1989).

Results and Discussion

The significant differences observed in the yield and quality parameters among the seven genotypes tested are presented in tables 1 and 2 respectively. The number of fruits per plant (22.25) and fruit length (39.64 mm) was recorded maximum in genotype Gili (Plate 1)while, minimum number of fruits per plant (18.50) and fruit length (30.67 mm) was recorded in genotypes Crystal and Sweet Charlie respectively.

The individual weight of fruit was found maximum (15.21 g) in Crystal followed by Winter Dawn (13.28 g) while, minimum (11.84 g) was observed in genotype Gili.

The maximum fruit girth (29.40 mm) was recorded in genotype Crystal followed by Sweet Charlie (29.28 mm) whereas minimum (25.97 mm) was recorded in Gili (Fig. 1). This observation finds support from the findings of Dwiwedi *et al.*, (2004).

Table.1 Performance of strawberry genotypes for yield attributes

Genotypes	Number of fruits	Fruit Weight (g)	Fruit girth (mm)	Fruit length (mm)
Winter Dawn	22.25	13.28	27.75	35.16
Sweet Charlie	22.00	12.75	29.28	30.67
Gili	22.25	11.84	25.97	39.64
Barak	19.75	12.06	26.67	35.95
Crystal	18.50	15.21	29.40	37.84
CV (%)	4.22	14.15	5.47	11.64
C.D (0.05)	1.13	2.02	2.34	3.20

Table.2 Performance of strawberry genotypes for quality attributes

Genotypes	TSS (^{0} Brix)	Acidity (%)	Reducing sugars (%)	Non-reducing sugars (%)	Total Sugars (%)	Sugar Acid ratio
Winter Dawn	9.05	0.53	6.31	2.05	8.37	16.00
Sweet Charlie	8.40	0.46	5.90	1.92	7.83	20.24
Gili	8.80	0.54	6.62	2.15	8.77	16.26
Barak	9.50	0.41	7.01	2.30	9.40	22.64
Crystal	9.40	0.31	5.76	1.80	7.64	24.65
CV (%)	10.45	23.98	14.53	14.56	14.57	26.93
C.D (0.05)	0.91	NS	1.04	NS	0.92	3.58

Fig.1 Yield parameters of strawberry genotypes

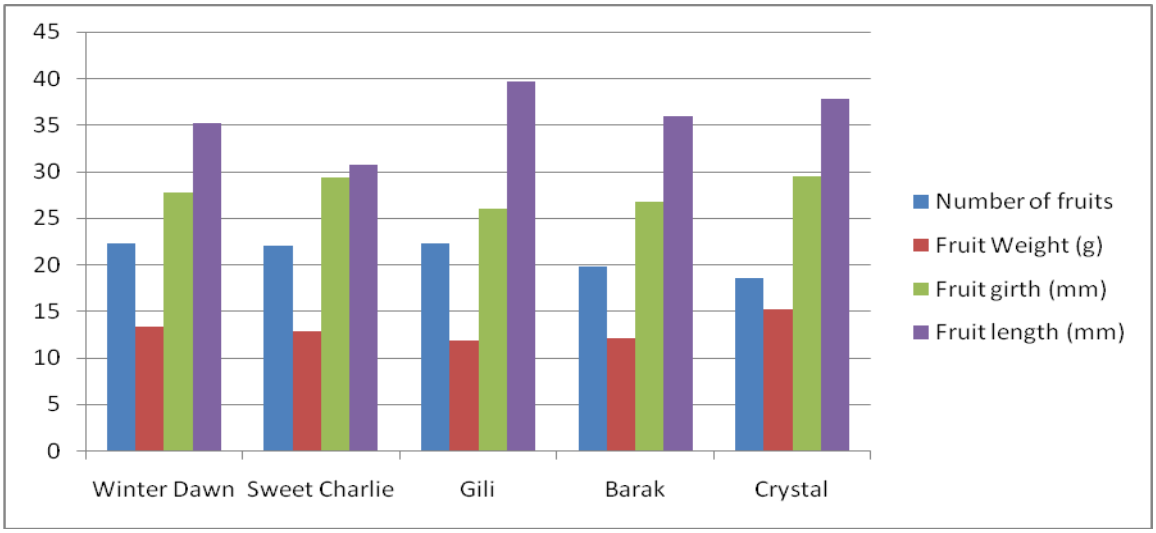


Fig.2 Biochemical trait attributes of strawberry genotypes

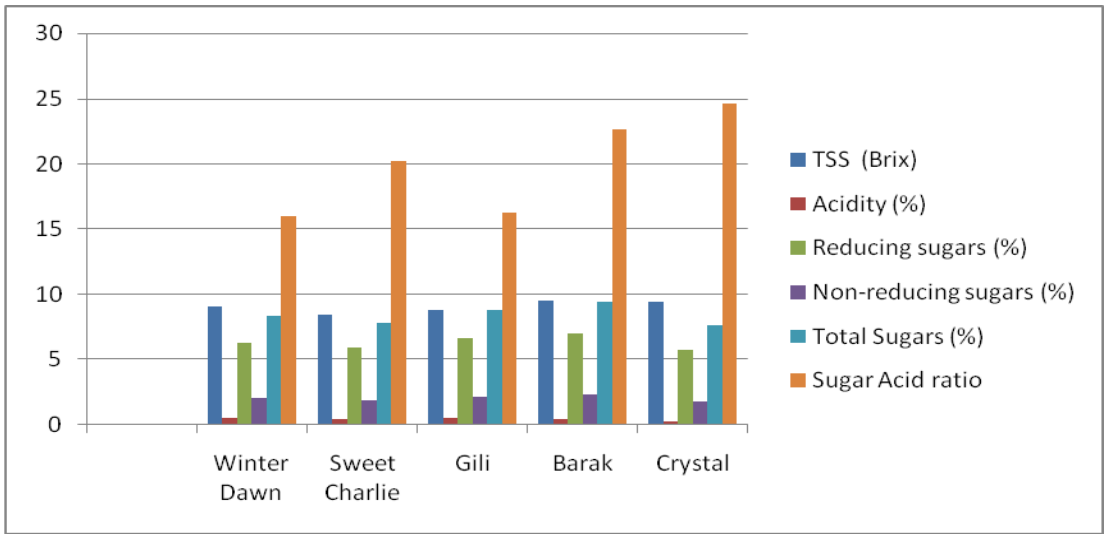
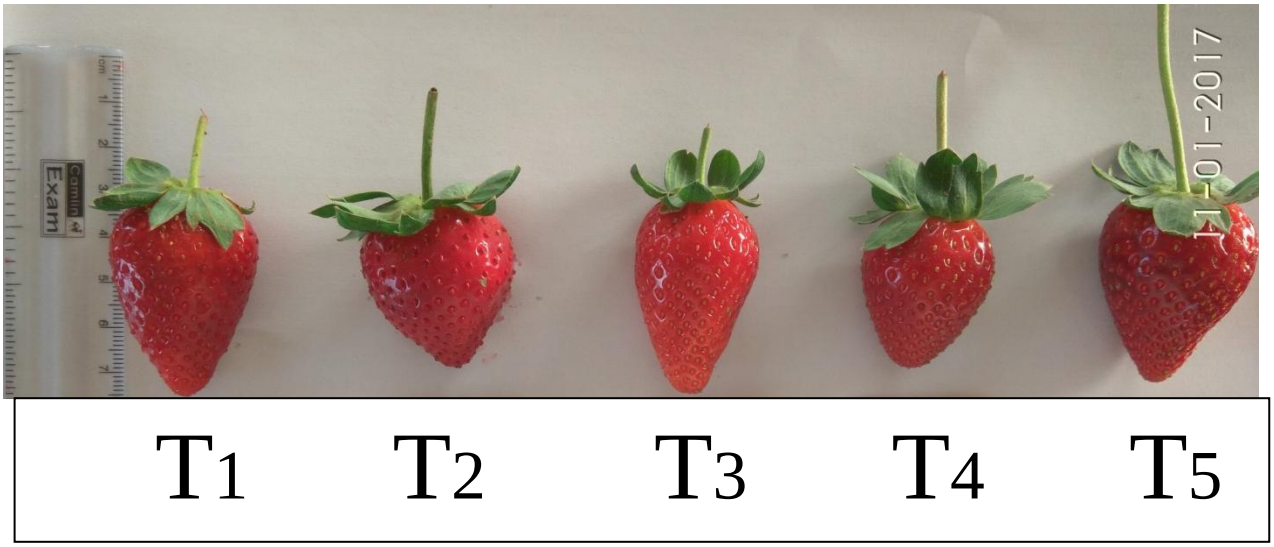


Plate.1 Variation in fruit characters among the five genotypes of strawberry



Among the biochemical traits (Fig. 2), Barak recorded the maximum total soluble solids (9.50 ºB) followed by the genotype Crystal (9.40 ºB) while that of the minimum (8.40 ºB) was found in genotype Sweet Charlie. The finding was comparable with that of Das *et al.,* (2007). The genotype Barak recorded maximum reducing sugars (7.01%), non-reducing sugars (2.30%) and total sugars (9.40%) followed by the genotype Gili (6.62%, 2.15% and 8.77% respectively) whereas lowest was recorded in genotype Crystal (5.76%, 1.80% and 7.64% respectively). The difference may be due to genetic variability and acclimatization of genotypes to that area. The titrable acidity was found lowest in genotype Crystal (0.31%) while maximum was reported in Gili (0.54%). Genotypes differed in their content for different traits mainly because of effect of cultural practices on different rates of biosynthetic pathways. This finding is in agreement with the observation made by Coombey (1976). Varietal differences in yields depend on a number of factors *viz.*, fruit bearing potential of the cultivar, development of growth of plants; weather conditions (Kiprijanovski and Arsov, 2004). The maximum sugar to acid ratio (24.65%) was recorded in Crystal genotype. The minimum sugar to acid ratio (16.00%) was observed in Winter Dawn. Fruit composition is highly dictated by availability of light and night temperature as different genotypes differ in their requirement. The similar results were obtained by Chandel and Badiyala (1996), Das *et al.,* (2007), Sharma *et al.,* (2014), Kumar *et al.,* (2011). Among the genotypes tested, Crystal recorded significantly higher yield and quality parameters. The differences are purely because of its adoptability for the given location and for the cultural practices

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