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STUDY THE POST HARVEST CHARACTERS OF BANANA AS INFLUENCED BY GROWTH REGULATORS AND CHEMICALS

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Abstract: *For studying post harvest characters of Red banana as influenced by growth regulators and chemicals, experiment was carried out in Horticultural Laboratory, Department of Horticulture, SHIATS, Allahabad. Six fruits in each replication were dipped in growth regulators viz., GA_3 0.02%, NAA at 0.025% and Chemicals viz., Bavistin at 0.1%, Indofil M 45 at 0.2% and $K_2S_2O_5$ at 0.5% for 5 min. After air drying under shade the fruits were sealed in polythene bags of 200 gauge thickness. The fruits in control were dipped in distilled water, the best treatment combination for red banana in respect of green life, red life and TSS was GA_3 (0.02%). Minimum physiological weight loss among all treatments also found in GA_3 (0.02%). Green life of red banana fruits treated with GA_3 (0.02%), increased by 43.20% against untreated (control) fruits and red life of red banana fruits increased by 37.52% against untreated (control) fruits.*

Introduction: The post harvest losses of fresh banana fruits goes up to 30-40% due to improper handling and storage. Bananas are harvested when reach to full maturity for local market and immature for export. Sometimes, markets do not absorb all the bananas full for harvest. Due to the short life of bananas which reduces their survival in the market a long time for this, prolonging the life of banana to the largest possible period is considered beneficial to the dealer, whether for export or domestic consumption [1]. Thus the experiment was undertaken to investigate the effect of different treatments on the storage of shelf life of banana and also to determine the chemical changes occurring during storage when the fruits are treated by these growth regulators and chemicals

Materials and Methods

An investigation was find out the effect of post harvest growth regulator. Laboratory experiments were carried out in Horticultural Laboratory, Department of Horticulture, SHIATS, Allahabad. Six fruits in each replication were dipped in growth regulators *viz.*, GA_3 0.02%, NAA at 0.025% and Chemicals *viz.*, Bavistin at 0.1%, Indofil M 45 at 0.2% and $K_2S_2O_5$ at 0.5% for 5 min. After air drying under shade the fruits were sealed in polythene bags of 200 gauge thickness. The fruits in control were dipped in distilled water. The observations were recorded on green life, red life, physiological loss in weight, total soluble solids, acidity, reducing sugars, non-reducing sugar and total sugars. The experiment was laid out in CRD with six treatments and five replications each including control.

Results and Discussion

The effect of growth regulators and chemicals on green life of Red banana is significant with that of control (Table 1). Highest green life was observed in full matured fruits treated with GA3 0.02 per cent (17 days), followed by Bavistin 0.1 per cent (15.00 days), control being the least (9.67 days). Also observed that extended storage life of banana cv. Basrai up to 16 days when treated with different growth regulators and kept at 30°C [2]. These findings are also in conformity with [3] in banana cv. Giant Governor. The reason for the extended green life in the treatments might be that, these growth regulators being plant hormones known to prolong growth phase through maintenance of protein synthesis and mobilization of nutrients at the site of application [4]. Dip treatment of banana fruits in chemicals like Bavistin and Indofil M–45 was not only effective against post harvest decay caused by *Colletotrichum musae* [5] but it also increased shelf life up to 14 days without affecting the quality.

Red life (Days): The Red life was high in the fruits treated with Bavistin 0.1 per cent and the fruits can be kept without affecting quality for 5 days (Table 4.1). This might be due to the fact that chemicals like Bavistin kept the fruits from post harvest rots. All the treatments viz., GA3 (5.33 days), Indofil M-45 0.2 per cent (4.33 days), Bavistin (0.1%) (4.33), NAA 0.025 per cent (3.33 days) and Potassium Meta bisulphate (0.5%) (3.33 days) had significant difference over control (3.33 days).

Total Soluble Solids: The TSS content of ripe fruits subjected to treatment with various concentrations of growth regulators and chemicals did not show significant change as the values remained on par (Table 2) and values ranged from 13.20 Potassium Metabisulpahte (0.5%) to 13.70 GA_3 (0.02%). The TSS of control was 13.37 oBrix. Increase in TSS in chemical treated fruits of banana cultivar c.v. Basrai was reported [4, 6] in banana cultivar Rasthali.

Acidity: The treatment with various concentrations of chemicals and growth regulators significantly influenced the acidity (Table 2). Highest acidity was observed in 0.025% NAA (0.47 %) followed by fruits treated with control. The fruits treated with Bavistin 0.1 per cent and GA3 0.02 per cent showed significant differences from other treatments and control with less acidity (0.33%). Similar results were obtained [3] in banana cv. Giant Governor where high acidity was observed in control than treated bananas.

Physiological Loss in Weight: The PLW was significantly influenced by treatments with various growth regulators and chemicals (Table 2). PLW was found highest in the fruits treated with 0.1 % Bavistin (9.90) and the least was observed in the fruits treated with GA3 0.02 per cent (3.40). The reduction in weight loss in the fruits treated by growth regulators might be due to less dehydration as a result of less transpiration. Also found that post harvest treatment with GA3150 ppm reduced weight loss in banana [2, 3 & 7].

Reducing, Non-reducing and Total Sugar: There was no significant difference found between the treatments on reducing sugars (Table 2). The reducing sugars in NAA (0.025%) was very highest (7.57 %), thus showed significant variation with that of treatments. The non-reducing sugars in Indofil M-45 (0.2%) was very highest (3.47 %), thus showed significant variation with that of treatments. Among the treatments, total sugars were high in the fruits treated with Bavistin 0.1 per cent (10.21%) followed by Potassium metabisulphate (0.5%) (10.12%). However, all the treatments were on par with each other. Similar results were obtained [3].

Table 1: Effect of growth regulators and Chemicals on Green life (days) and Red life (days) of Red Banana

S. No.	Treatments	Green life (Days)	Red life (Days)
T_1	GA_3 (0.02%)	17.00	5.33
T_2	NAA (0.025%)	13.33	3.33
T_3	Bavistin (0.1%)	15.00	4.33
T_4	Indofil M-45 (0.2%)	12.00	4.33
T_5	Potassium Meta bisulphate (0.5%)	11.33	3.67
T_6	Control	9.67	3.33
	S.Ed.	0.66	0.57
	C. D.	1.37	1.18
	F-test	S	S

Note :- S– Significant; NS–Non Significant

Table 2 Effect of growth regulators and Chemicals on quality characters of Red Banana.

S. No.	Treatments	TSS	Acidity	PLW (%)	Reducing Sugar	Non-Reducing Sugar	Total Sugar
T_1	GA_3 (0.02%)	15.70	0.33	3.40	7.50	2.47	9.16
T_2	NAA (0.025%)	15.63	0.47	3.70	7.57	2.63	10.03
T_3	Bavistin (0.1%)	15.33	0.33	9.90	6.64	2.53	10.21
T_4	Indofil M-45 (0.2%)	15.27	0.42	6.43	6.55	3.47	10.02
T_5	Potassium Meta bisulphate (0.5%)	13.20	0.44	6.80	7.19	2.93	10.12
T_6	Control	13.37	0.46	7.63	5.73	2.50	8.23
	S.Ed.	0.29	0.02	0.24	0.42	0.25	0.37
	C. D.	0.60	0.04	0.50	0.87	0.52	0.76
	F-test	S	S	S	S	S	S

Note : S–Significant; NS–Non Significant

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