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Effect of liquid paraffin on physiological loss in weight of mango fruits cv. Himsagar

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Abstract

The current investigation was performed to analyse the effect of coating of liquid paraffin on physiological loss in weight and volume of mango fruits (*Mangifera indica* L.) cv. Himsagar kept in CFB box during storage period at ambient conditions. The experiment was laid out in Completely Randomized Design with total 10 treatments and three replications. The treatments consisted of multiple pedicel length such as 2.5 cm fruit pedicel, 1.5 cm fruit pedicel, 0.5 cm fruit pedicel, 0 cm fruit pedicel as coated and uncoated with liquid paraffin in combinations. Whole fruit coated without pedicel were considered a treatment and uncoated fruits without pedicel were considered as control. Reduction in weight was found lowest in whole coated fruits without pedicel. Physiological loss in weight of fruits was calculated at every 02 days interval till 15th day. On the last day of storage minimum PLW was noted in full coated fruit having no pedicel (12.45 %) while it was found maximum in fruits left untreated i.e. control (28.40%).

Keywords: liquid paraffin, physiological loss in weight, CFB

Introduction

Mango (*Mangifera indica* L.) is eulogized as the most important commercial fruit in India as well as in other South-East Asian countries. It is extremely popular among the masses as the king of fruits and belongs to dicotyledonous Family Anacardiaceae. It has exemplary nutritive value along with superior taste. The untreated fruits have a shelf life of around 7-8 days and after that period spoilage precedes in them. Different biochemical and physiological changes starts occurring in fruit such as biosynthesis of essential oils, flavour components, carotenoids, breakdown of pigment chlorophyll. Autocatalytic production of ethylene increases the rate of respiration promoting physiological, biochemical and organoleptic changes in the fruit ultimately resulting into the change in characteristic taste, aroma, colour with desirable ripening. At the time of harvest the Indian farmers have to suffer economic loss as abundance of fruits in the market results in the crash of prices even after surplus production. We need to find methodologies to exploit the surplus production of fruits through off season sale. Farmers who are not economically strong enough to afford cold storage to preserve their harvest can easily adopt the method of coating the fruit skin with liquid paraffin. It decelerates the rate of respiration thus, retarding the loss in weight of fruits along with keeping the physical structure of fruit intact. The above mentioned study was conducted at the orchard of Department of horticulture, BAU, Kanke, Ranchi.

Materials and Methods

Fruits were harvested with secateurs leaving more than 5 cm of fruit stalk. The fruits were harvested in early morning of the day for the purpose of the experiment, from the orchard of Department of Horticulture, Birsra Agricultural University (Ranchi). Fully matured fruits were harvested carefully preventing any mechanical injury and damage. They were carried to the experimental site in cartons. Fresh firm and well developed fruits of uniform size and maturity, free from pests and diseases, injuries, bruises and blemishes were selected for the experiment. The fruits were washed with tap water twice to remove dirt particles, field heat and then fruits graded into different grades and kept according to their physical characteristics. Each fruit was then kept onto newspaper sheets gently in a clean and ventilated room to remove excess water on the peel. Fruit stalks were coated and experiment was carried out as specified in treatment details. Fruit stalks were cut with sharp blades as per treatment details and replication and coating with paraffin liquid was also done simultaneously. The stalks and the fruits were coated with the help of cotton. All the fruit lots were kept in well ventilated (2%) CFB Box lined by newspaper sheets.

Fruits used for the experiment were stored in different lots containing 10 fruits per treatment per replication. Recording of the parameters were done on 1st day (at the day of harvest), 3rd, 5th, 7th, 9th, 11th, 13th and on 15th day of harvest. Altogether 10 treatments were studied in three replications. Mango fruits were arranged separately and randomly under different treatments. Observation were noted as specified below for all the 10 treatments replicated thrice, separately on the same day and at alternate days interval during the storage period.

Results and Discussion

Physiological loss in weight (PLW)

The physiological loss in weight of fruits (per cent) ranged from minimum value of PLW (1.71%) observed on 3rd day of storage and maximum on last day of storage. It showed gradual increase with the advancement in days of the storage period in all the treatments used. Significantly lower value of PLW (12.45%) was shown by full fruit coated with liquid paraffin @6% without pedicel followed by treatment T₁ (15.24%) and T₂ (15.85%), while higher value of PLW

(28.40%) was observed in untreated fruit (T₁₀). It could be concluded that the rate of decrease of weight was evident in uncoated fruits as compared to coated ones. Physiological weight loss significantly increased during storage because of enhanced respiration rate and loss of water due to transpiration, dehydration and metabolic activity. Present study revealed that coating the fruits lead to reduction in weight loss percentage. Fruit coating is known to create similar effect as in case of modified atmosphere storage by modifying internal gas composition. This was supported by the work done by Tharanathan *et al.* (2003) [5] in mango. Results of the present experiment are justified by contribution of Baldwin *et al.* (1999) [1] and Castrillo and Bermudez, (1992) on mango fruits who reported that coating restricts the water vapour and gas exchange by creating a semi-permeable barrier, leading to reduction in weight loss, modification in respiration rate and delay in ripening of fruits. It was in line with the study performed by Jagadeesh *et al.* (2001) [5] in guava.

Table 1: Effect of Liquid Paraffin and Carbon-dioxide on physiological loss of weight (per cent) of mango fruits

Treatments	Day 1	Day 3	Day 5	Day 7	Day 9	Day 11	Day 13	Day 15
T1	0 (0)	1.80 (7.701)	3.65 (11.014)	7.24 (15.602)	9.03 (17.48)	10.77 (19.156)	12.56 (22.357)	15.25 (22.969)
T2	0 (0)	3.63 (10.712)	4.14 (11.73)	8.28 (16.713)	10.34 (18.752)	12.41 (20.618)	14.48 (22.732)	15.85 (23.451)
T3	0 (0)	2.13 (8.398)	4.27 (11.921)	8.54 (16.985)	10.67 (19.061)	12.81 (20.961)	14.94 (22.926)	17.65 (24.829)
T4	0 (0)	2.17 (8.466)	4.34 (12.019)	8.72 (17.165)	10.85 (19.221)	13.02 (21.14)	15.19 (23.73)	17.92 (24.99)
T5	0 (0)	2.33 (8.774)	4.63 (12.421)	9.26 (17.712)	11.58 (19.884)	13.89 (21.876)	16.21 (24.661)	18.59 (25.535)
T6	0 (0)	2.49 (9.073)	4.98 (12.885)	9.95 (18.383)	12.44 (20.65)	14.93 (22.721)	17.42 (25.319)	19.75 (26.375)
T7	0 (0)	2.62 (9.309)	5.24 (13.223)	10.48 (18.884)	13.11 (21.216)	15.68 (23.317)	18.30 (26.827)	21.00 (27.26)
T8	0 (0)	2.91 (9.826)	5.83 (13.962)	11.67 (19.967)	14.57 (22.427)	17.48 (24.699)	20.39 (20.216)	22.97 (28.626)
T9	0 (0)	1.71 (7.514)	3.42 (10.658)	6.85 (15.159)	8.56 (16.998)	20.32 (26.78)	11.95 (29.12)	12.45 (30.688)
T10	0 (0)	3.40 (10.625)	6.77 (15.075)	13.54 (21.587)	16.93 (24.287)	10.27 (18.684)	23.70 (22.357)	28.40 (31.932)
S.E.m. ±	-	1.78 (0.561)	1.49 (0.048)	1.48 (0.08)	1.46 (0.08)	1.45 (0.083)	1.44 (0.092)	0.63 (0.455)
CD (p=0.01)	NS	5.24 (1.666)	4.41 (0.143)	4.38 (0.238)	4.32 (0.238)	4.28 (0.248)	4.25 (0.272)	1.85 (1.352)
CV (%)	-	1.45 (1.745)	1.24 (0.669)	1.30 (0.778)	1.32 (0.695)	1.34 (0.657)	1.37 (0.665)	5.51 (2.998)

T₁ - CO₂ (1%); T₂ - Fruit having 2.5 cm pedicel and coated with liquid paraffin on tip; T₃ - Fruit having 2.5 cm uncoated pedicel; T₄ - Fruit having 1.5 cm pedicel and coated with liquid paraffin on tip; T₅ - Fruit having 1.5 cm uncoated pedicel; T₆ - Fruit having 0.5 cm pedicel and coated with liquid paraffin on tip; T₇ - Fruit having 0.5 cm uncoated pedicel; T₈ - Fruit having no pedicel and coated with liquid paraffin on tip; T₉ - Fruit having no pedicel and entire fruit coated with liquid paraffin; T₁₀ - Fruit having no pedicel and uncoated (control).

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References

- Baldwin EA, Burns JK, Kazokas W, Brecht JK, Hagenmaier RD, Bender RJ, Pesis E. Effect of two coatings with different permeability characteristics on mango (*Mangifera indica* L.) ripening during storage. *Postharv. Biol. Technol.* 1999; 17:215-226.
- Castrillo M, Bermudez A. Post-harvest ripening in wax coated "Bocado" mango. *Journal of Food Science and Technology.* 1992; 27(4):457-463.
- Jagadeesh SL, Rokhade AK, Lingaraju S. Influence of post-harvest treatments on storage behaviour of guava fruits cv. Sardar. *Journal of Maharashtra Agricultural Universities.* 2001; 26(3):297-300.
- Tharanathan R, Yashoda H, Prabha T. Mango (*Mangifera indica* L.), The King of fruits an overview. *Food reviews international.* 2006; 22:95-123.