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# STUDY ON PHYSICO-CHEMICAL CHARACTERISTICS AND POST-HARVEST WEIGHT LOSS OF SEVEN MANGO VARIETIES GROWN AT CHAPAINAWABGANJ

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**ABSTRACT**

Islam MS, Shikder S, Uddin MS, Khan MSI, Kader HA (2016) Study on physico-chemical characteristics and post-harvest weight loss of seven mango varieties grown at Chapainawabganj. *Int. J. Sustain. Crop Prod.* 11(3), 36-38.

An experiment was conducted at the Horticulture Laboratory of Regional Horticulture Research Station, Bangladesh Agricultural Research Institute, Chapainawabganj during the period from June, 2015 to August, 2015. The objectives of the study were to know the post harvest weight loss and biochemical properties of mangoes. Seven important mango varieties were included in this study such as BARI Aam-1, 2, 3, 4, 6, Khirsapat and Langra. All varieties were lost their weight with the increase of storage period and 7$^{th}$ days after harvest BARI Aam-1, 6 and Khirsapat varieties were rotten and the maximum weight loss (12.45%) was recorded at Langra followed by BARI Aam-4 (10.50%) and BARI Aam-2 (9.56%). The minimum (8.44%) weight loss was recorded from BARI Aam-3. The highest pH (4.5) was recorded from BARI Aam-6 followed by BARI Aam-3 (4.4) and the lowest (3.5) from variety Langra. The maximum (7 days) shelf life was recorded from the variety BARI Aam-2, 3, 4 and Langra and the minimum (6 days) from the variety BARI Aam-1, 6 and Khirsapat. Therefore, appropriate measures should be taken to avoid weight loss of each variety and mangoes should make available to the consumers as soon as possible just after harvest.

***Key words:*** *physico-chemical, properties, post-harvest weight loss, variety, shelf-life*

## INTRODUCTION

Mango (*Mangifera indica* L.) is one of the most popular and commercially important fruit in tropics and subtropics particularly in Asia where it is considered as the "King of fruits" (Singh 1996). It belongs to the family Anacardiaceae. Mango grows well throughout the country but the commercial cultivation is concentrated in North-Western region of the country such as Rajshahi and Chapainawabganj districts (Uddin *et al*. 2007). The annual mango production of the country is 9.45 lac ton (BBS 2014). Based on taxonomic investigation and recent molecular evidence it is now apparent that the mango probably evolved within a large area including North-Western Myanmar, Bangladesh and North-Eastern India (Litz 1997). This fruit is well accepted to the consumers all over the world for its special organoleptic features such as excellent flavor, pleasant aroma, luscious taste, lovely size and attractive color. In nutritional aspects, both ripe and unripe mango is superior and rich in several vitamins as well as minerals (Paramanik 1995). A considerable amount of mango fruits losses every year during harvesting, sorting, grading, storage, transportation, selling and consumption due to its perishable nature. The perishability of this fruit is attributed to immense physiological changes after harvest (Momen *et al*. 1993). Amiruzzaman (1990) reported that the magnitude of post-harvest losses in fresh fruits including mango in Bangladesh is about 25-50% while it is only 5-25% in developed countries. Post-harvest weight loss also occurred during storage. There is study regarding post-harvest weight loss of mangos in Bangladesh. Therefore, the present study has been undertaken to know the weight loss pattern and physico-chemical properties of seven mango varieties.

## MATERIALS AND METHODS

The present experiment was conducted at the horticulture Laboratory of the Regional Horticulture Research Station, BARI, Chapainawabganj during the period from June, 2015 to August, 2015 to study the shelf life and biochemical quality changes of seven important commercial mango varieties. Weight loss was determined by days after changes the weight percentage, the total soluble solids (TSS) are determined by using refractometer at room temperature. Shelf life of mango fruits as influenced by different postharvest treatments was calculated by counting the number of days required to ripen fully with retained optimum marketing and eating qualities. Shelf life of each variety was determined while 50% fruits were rotten completely. The collected data on various parameters were statistically analyzed using MSTAT statistical package programme (Russel 1986) and means were compared by least significant difference (LSD) test as described by (Gomez and Gomez, 1984).

### Weight loss

Four out of 10 fruits of each replication of each variety were weighed initially and held at laboratory for data collection. Weight loss was calculated using the following formula:

$$\text{Percent weight loss (\%WL)} = \frac{\text{IW-FW}}{\text{IW}} \times 100$$

Where, WL = Percent total weight loss, IW = Initial weight of fruits (g), FW = Final weight of fruits (g)

**Shelf life**

Shelf life of mango fruits of different varieties were calculated by counting the number of days required to ripen fully with retained optimum marketing and eating qualities.

## RESULTS AND DISCUSSION

Significant variations were observed in respect of percent weight loss among the varieties. The size and weight of the fruits were different and the percent weight loss also different. The weight loss trended to increase with the advancement of storage period in all the varieties. At 3rd days after harvest, the maximum (7.93%) weight loss was recorded from commercial variety Khirsapat followed by BARI Aam-1 (7.52%) while the minimum (3.46%) at BARI Aam-2. Likewise, at the 6th days after harvest, the maximum (16.20%) weight loss was recorded from commercial variety Khirsapat followed by BARI Aam-1 (15.82%) while the minimum (6.69) at BARI Aam-2 (Table 1). At the 7th days after harvest, BARI Aam-1, BARI Aam-6 and Khirsapat variety have started rotten and other varieties continues to loss weight and recorded at BARI Aam-2, 3, 4 and Langra were 9.56%, 8.44%, 10.50%, 12.45% respectively. From the experimental results, it was observed that BARI Aam-3 and BARI Aam-4 remain marketable with the minimum percent weight loss (Table 1). These results are in agreement with those of Carrillo *et al.* (2000) who observed that coated or uncoated Haden mango in Mexico had an increasing trend of weight loss with the passage of storage time.

Table 1. Represents post-harvest weight loss (%) day by day at room temperature

| Varieties | Initial wt (g) | 2nd DAH | 3rd DAH | 4th DAH | 5th DAH | 6th DAH | 7th DAH |
|---|---|---|---|---|---|---|---|
| BARI Aam-1 | 215.6 e | 4.833 ab | 7.527 a | 9.590 a | 14.13 a | 15.82 a | Rotten |
| BARI Aam-2 | 285.2 c | 2.537 c | 3.460 c | 4.550 c | 5.627 c | 6.69 d | 9.56 b |
| BARI Aam-3 | 210.8 f | 3.027 c | 5.29 b | 6.347 b | 6.630 c | 7.277 c | 8.44 c |
| BARI Aam-4 | 780.2 a | 2.720 c | 3.780 c | 4.793 c | 6.013 c | 7.167 c | 10.50 b |
| BARI Aam-6 | 325.6 b | 4.417 ab | 5.617 b | 8.693 a | 9.467 b | 11.66 b | Rotten |
| Khirsapat | 270.6 cd | 5.113 a | 7.933 a | 9.937 a | 14.98 a | 16.20 a | Rotten |
| Langra | 260.2d | 4.180 b | 5.697 b | 8.693 a | 10.33 b | 11.34 b | 12.45 a |

Table 2. Represents pulp pH and Shelf life of each variety during consumption

| Varieties | Pulp pH | Shelf life (days) |
|---|---|---|
| BARI Aam-1 | 3.8 | 6 |
| BARI Aam-2 | 3.9 | 7 |
| BARI Aam-3 | 4.4 | 7 |
| BARI Aam-4 | 4.1 | 7 |
| BARI Aam-6 | 4.5 | 6 |
| Khirsapat | 4.0 | 6 |
| Langra | 3.5 | 7 |
| Mean | 4.02 | 6.43 |

The highest pH (4.5) was recorded from BARI Aam-6 followed by BARI Aam-3 (4.4) and the lowest (3.5) from the variety Langra. The maximum (7 days) shelf life was recorded from the variety BARI Aam-2, 3, 4 and Langra and the minimum (6 days) from BARI Aam-1, 6 and Khirsapat (Table 2).

## CONCLUSION

From the experimental results, it was revealed that post harvest weight loss was occurred to each variety. At 7th days after harvest Langra variety losses its weight the maximum (12.45%) and BARI Aam-3 recorded the minimum (8.44%) weight loss. Weight loss is an important consideration for mango storage as well as mango business. The per capita availability of fruit is further reduced due to a high level of post-harvest losses. Post-harvest loss of fresh fruit is one of the important problems in the tropics. A huge quantity of nutritious fruits goes waste due to lack of proper post-harvest handling and post-harvest disease. Therefore, we should consider this parameter as an important aspect and take necessary measure to reduce it.

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