

FRUIT CHARACTERISTICS OF SOME LATE MANGO (*MANGIFERA INDICA*) VARIETIES OF BANGLADESH

N. N. Saha, M. A. J. Bhuyan, M. S. Islam and
A. K. M Amzad Hossain

*Horticulture Research Centre
Bangladesh Agricultural Research Institute
Joydebpur, Gazipur-1701, Bangladesh*

Abstract

Fruit characters of some superior late mango varieties were studied from a mango fruit show in July, 1986. The fruits of the varieties Fazli, Ashwina, Kuapahari and Mohanbhog weighed 1290, 1495, 480 and 510 g respectively. Highest TSS was recorded in the sweetest fruits of Kuapahari (22.0%) followed by Ashwina (21.0%), Mohanbhog (20.0%) and Fazli (19.6%). The range of edible portions in Ashwina, Fazli, Kuapahari and Mohanbhog were 72.9-84.2, 70.1-84.7, 60.0-70.2 and 65.6-73.9% respectively.

Key words : Fruit characters, Late mango varieties.

Introduction

Mango is called the king of fruits in this region. It is a popular fruit of Bangladesh and occupies first position in area and second in production. Earlier there was plenty of mango in this country. But during the last ten years or so the rate of production is declining. The total production came down from 264100 t (1976-77) to 159015 t (1985-86) (Anonymous, 1985 and 1987) even with the increase of area by 7510 acres during the last 10 years and the yield came down from 2.48 to 1.40 t per acre.

The shortage of fruit production in the country is acute. The availability of fruit per head per day is only 40 g (Rashid, 1987) which is much less than the optimum requirement. Although mango grows all over Bangladesh but

only one fourth of the area is covered by quality varieties. Moreover, it is propagated through seeds in most of the cases resulting variation in regard to fruit characteristics. Hence a study was conducted through a mango fruit show to locate superior plants of popular late mango varieties grown in Bangladesh for improvement of the same.

Materials and Methods

Fruits of four late mango varieties were collected from national mango show for late varieties organised at Nawabgonj during 22-23 July, 1986. Participated mango growers displayed six fruits for each of the late mango varieties namely Ashwina, Fazli, Kuapahari and Mohanbhog.

An accession number was given to individual sample and the name and address of the growers were recorded. The total number of samples for Ashwina, Fazli, Kuapahari and Mohanbhog were 90, 43, 12 and 6 respectively. Important fruit characters like weight, their length, breadth and thickness, weight of skin, stone and pulp and edible portion of fruits were recorded. The colour of skin and pulp, shape of fruit, TSS, consistency of juice, fibrousness, taste and flavour were also recorded. Total soluble solids was estimated by refractometer. Organoleptic characters such as taste and flavour were evaluated by a panel of judges. Consistency of juice and fibrousness were noted by visual observation.

Results and Discussion

The fruits belonging to different late varieties of mango exhibited wide variation in respect of most of their physical characters and total soluble solids. The variability within and among the varieties in their quantitative and qualitative characters are shown in Table 1.

Fruit weight

Wide variation in respect of fruit weight was observed in the samples of four late varieties of mango. The smallest and largest fruits of Ashwina, Fazli, Kuapahari and Mohanbhog were 250 and 1290, 390 and 1495, 250 and 480 and 250 and 510 g respectively. And the mean weights of individual fruits were 718.61, 969.42, 386.67 and 351.67 g, respectively.

The fruits were much superior in weight to those studied by Ahmad (1974), Bhuyan and Islam (1986), Hossain and Talukder (1974) and Samad and Faruque (1976) except Fazli by Bhuyan and Islam (1986) and Mohanbhog by Ahmad (1974). This might be due to the fact that the fruit show created a scope for inclusion

of largest number of superior plants under those varieties.

Fruit length

Large variation in respect of fruit length was observed in Ashwina and Fazli but in Kuapahari and Mohanbhog it was comparatively less. The biggest fruit (20.5 cm) of Ashwina was more than double the length of smallest one (10.0 cm). In Fazli, the smallest and the biggest fruits were 12.6 and 21.0 cm, respectively. Fruit length of Kuapahari and Mohanbhog ranged from 9.2-13.0 and 7.9-10.4 cm.

The fruits of the varieties under study were superior, similar or smaller in length than those studied by Hossain and Talukder (1974) and Bhuyan and Islam (1986). The variability might be due to genotypic and environmental influence and management practices.

Fruit breadth

Fruits of different varieties differed in their breadth. The range of variation were 7.4-12.4, 8.0-11.7, 7.1-8.4 and 7.1-9.0 cm in Ashwina, Fazli, Kuapahari and Mohanbhog, respectively. Their mean breadths were 9.68, 10.35, 7.76 and 7.73 cm.

Fruits studied by Bhuyan and Islam (1986) were similar but the findings of Hossain and Talukder (1974) in respect of fruit breadth were different. The variation might be due to the locations enjoying different types of environmental conditions, year of production and out crossing among different varieties.

Fruit thickness

Variability in respect of thickness of fruit was large in Ashwina and Fazli but it was less in other two varieties, Kuapahari and Mohanbhog. It ranged from 5.8-9.8 in

Table 1. Fruit characteristics of four superior late mango varieties grown in Bangladesh.

| Character | Ashwina | Fazli | Kuapahari | Mohanbhog |
|-----------------------------|------------------------------|------------------------------|------------------------------|------------------------|
| Fruit weight | | | | |
| Range (g) | 250-1290 | 390-1495 | 250-480 | 250-510 |
| Mean (g) | 718.61 | 969.42 | 386.67 | 351.67 |
| SE | 23.07 | 37.87 | 24.68 | 43.94 |
| Fruit length | | | | |
| Range (cm) | 10.0-20.5 | 12.6-21.0 | 9.2-13.0 | 7.9-10.4 |
| Mean (cm) | 15.50 | 17.17 | 11.15 | 8.90 |
| SE | 0.13 | 0.29 | 0.34 | 0.42 |
| Fruit breadth | | | | |
| Range (cm) | 7.4-12.4 | 8.0-11.7 | 7.1-8.4 | 7.1-9.0 |
| Mean (cm) | 9.68 | 10.35 | 7.76 | 7.73 |
| SE | 0.08 | 0.14 | 0.12 | 0.33 |
| Fruit thickness | | | | |
| Range (cm) | 5.8-9.8 | 6.9-11.5 | 6.1-7.9 | 6.7-7.9 |
| Mean (cm) | 8.07 | 9.13 | 6.85 | 7.30 |
| SE | 0.09 | 0.14 | 0.14 | 0.21 |
| Total soluble solids | | | | |
| Range (%) | 13.2-21.0 | 9.4-19.6 | 14.0-22.0 | 16.0-20.0 |
| Mean (%) | 16.39 | 15.28 | 18.33 | 17.33 |
| SE | 0.15 | 0.32 | 0.70 | 0.68 |
| Skin weight | | | | |
| Range (g) | 30-200 | 55-200 | 50-90 | 40-100 |
| Mean (g) | 94.20 | 118.49 | 65.83 | 55.00 |
| SE | 3.41 | 6.06 | 4.99 | 9.61 |
| Stone weight | | | | |
| Range (g) | 20-110 | 40-115 | 30-90 | 30-60 |
| Mean (g) | 55.68 | 84.65 | 63.33 | 48.33 |
| SE | 1.58 | 2.80 | 4.66 | 5.44 |
| Pulp weight | | | | |
| Range (g) | 195-1010 | 295-1185 | 150-330 | 180-350 |
| Mean (g) | 562.10 | 764.15 | 257.50 | 248.33 |
| SE | 18.44 | 30.74 | 18.20 | 31.25 |
| Edible portion | | | | |
| Range (%) | 72.9-84.2 | 70.1-84.7 | 60.0-70.2 | 65.6-73.9 |
| Mean (%) | 78.82 | 78.72 | 66.26 | 70.63 |
| SE | 0.29 | 0.49 | 0.88 | 1.28 |
| Consistency of juice | | | | |
| | Light medium and thick | Light medium and thick | Light medium and thick | Light and medium |
| Fibrousness | | | | |
| | Scanty to medium | Scanty | Scanty | Scanty |

Table 1. Contd.

| Character | Ashwina | Fazli | Kuapahari | Mohanbhog |
|-------------------|---|------------------------------|-----------------------------|---|
| Skin colour | Green to dark green | Green to yellowish green | Greenish yellow | Yellow |
| Fruit shape | Obliquely oval to ovate oblique | Oblique to oblong oblique | Oblong oblique | Ovate to ovate oblique |
| Pulp colour | Yellow to yellowish orange | Orange yellow to deep yellow | Yellowish | Yellowish |
| Taste and flavour | Less tasty and comparatively less agreeable | Sweet with pleasant flavour | Sweet with pleasant flavour | Mildly sweet with less pleasant flavour |

Ashwina, 6.9-11.5 in Fazli, 6.1-7.9 in Kuapahari and 6.7-7.9 cm in Mohanbhog. The mean thickness were 8.07, 9.13, 6.85 and 7.30 cm in them.

Fruits with similar thickness were studied by Bhuyan and Islam (1986).

Total soluble solids

The percentage of total soluble solids which is an important character showed great variation within the varieties under study. It ranged from 13.2-21.0, 9.4-19.6, 14.0-22.0 and 16.0-20.0 per cent in Ashwina, Fazli, Kuapahari and Mohanbhog and means were 16.39, 15.28, 18.33 and 17.33 per cent, respectively. In respect of TSS content the fruits studied by Bhuyan and Islam (1986) were similar but those of Samad *et al.* (1975) were inferior.

Skin weight

Skin is a non-edible waste of the fruit. The less the quantity of skin the better will be the quality of the fruit. Large variation among the fruits belonging to each variety was observed in

respect of their skin content. The range of variation in the varieties were 30-200, 55-200, 50-90 and 40-100 g in Ashwina, Fazli, Kuapahari and Mohanbhog respectively and their mean weights were 94.20, 118.49, 65.83 and 55.00 g. The skin weight of the present study differed with those studied in the past (Ahmad, 1974; Hossain and Talukder, 1974 and Samad and Faruque, 1976).

Stone weight

If the potential of seed and its kernel is ignored then the stone is another non-edible waste. Biggest stones were found in Fazli weighing 115 g and it was smallest in Ashwina weighing 20 g only. The biggest stones in Ashwina, Fazli, Kuapahari and Mohanbhog were 110, 115, 90 and 60 g while smallest stones were 30 g each in Kuapahari and Mohanbhog, 20g in Ashwina and 40 g in Fazli variety.

Mangoes studied by Ahmad (1974) contained stones bigger than the present ones but conversely Hossain and Talukder (1974) got smaller seeds. While Samad and Faruque

(1976) recorded bigger seeds in Ashwina and Mohanbhog and smaller ones in Fazli and Kuapahari.

Pulp wieght

The fruits collected from different plants under the same variety showed large variation in their pulp content. The range of variations in Ashwina, Fazli, Kuapahari and Mohanbhog were 195-1010, 295-1185, 150-330 and 180-350 g respectively. This means that the ratios of lowest to highest pulp content were 1 : 5.2, 1 : 4.0, 1 : 2.2 and 1 : 1.9. Fruit of these varieties studied in the past contained smaller quantity of pulp (Hossain and Talukder, 1974; Samad and Faruque, 1976).

Edible portion

A considerable variation was also observed in the edible portion of fruits belonging to the varieties under study. It varied from 72.9-84.2, 70.1-84.7, 60.0-70.0 and 65.6-73.9 per cent in Ashwina, Fazli, Kuapahari and Mohanbhog respectively. Their mean edible portions were 78.82, 78.72, 66.26 and 70.63 per cent. More or less similar edible portions were reported by Ahmad (1974) and Samad and Faruque (1976).

Consistency of juice

The consistency of juice of all the varieties under study were divided into three groups, light, medium and thick. The varieties Ashwina, Fazli and Kuapahari contained light, medium and thick juice while Mohanbhog contained only light and medium juice.

Fibrousness

The varieties under study were almost fibreless. Only the variety Ashwina contained little fibre while Fazli, Kuapahari and Mohanbhog varieties of mango contained little or no fibre.

Fibre content of the varieties under study is in agreement with the findings of Samad and Faruque (1976).

Skin colour

With little variation the mature fruits of Ashwina, Fazli, Kuapahari and Mohanbhog were green to dark green, green to yellowish green, greenish yellow and yellow respectively. More or less similar skin colour was recorded by other authors (Samad and Faruque, 1976).

Fruit shape

Variation in respect of fruit shape within the varieties was slight. Fruits of Ashwina, Fazli, Kuapahari and Mohanbhog were obliquely oval to ovate oblique respectively in their shapes. Hossain and Talukder (1974) recorded the fruit shapes of Ashwina, Fazli Kuapahari and Mohanbhog as ovate oblique, oblongish, oblong elliptic and round to oval which is similar to the present findings.

Pulp colour

The fruits of all the varieties under study contained yellow like pulp. Pulp colour of Ashwina was yellow to yellowish orange, while that of Fazli was orange yellow to deep yellow and in Kuapahari and Mohanbhog as yellowish. Hossain and Talukder (1974) recorded the similar pulp colour in the varieties under study.

Taste and flavour

Fruits of almost all the varieties were mild to moderate in sweetness. The taste of Ashwina was less sweet and it was comparatively less agreeable. Similarly the fruits of Mohanbhog was mildly sweet with less pleasant flavour. But Fazli and Kuapahari were sweet having pleasant flavour.

Hossain and Talukder (1974) obtained the fruits of Ashwina as aromatic and slightly sour. The fruits of Fazli were very sweet and delightful, Kuapahari were sweet and aromatic and Mohanbhog were sweet and good. Samad and Faruque (1976) also judged the fruits of Ashwina, Fazli, Kuapahari and Mohanbhog. Those were aromatic and medium sweet, very sweet and delightful, sweet and aromatic and sweet respectively.

References

- Ahmad, K. U. 1974. Review of Researches of the Division of Horticulture, Horticulture Division, BARI, 142 p.
- Anonymous, 1985 and 1987. Year book of Agricultural Statistics. Bangladesh Bureau of Statistics. Statistics Division, Ministry of Planning, Govt. of the People's Republic of Bangladesh, Dhaka, pp 325-327 and 175.
- Bhuyan, M. A. J. and M.S. Islam. 1986. Physico-chemical studies of some varieties of mango grown at Nawabganj. Bangladesh Horticulture. 14(1) : 42-44.
- Hossain, M. A. and M. R. Talukder. 1974. Characteristics of Bangladesh Mangoes grown at Rajshahi. M.Sc. (Ag). Thesis submitted to the Bangladesh Agricultural University, Mymensingh.
- Rashid, M. M.; M. A. Quadir and M.M. Hossain, 1987. Bangladesher Phal. Rashid Publishing House, BARI Campus, Joydebpur, Gazipur. 243 p.
- Samad, M. A.; A. H. M. Faruque and M. A. Malek. 1975. A study on the biochemical characteristics of fruits of some common mango varieties of Bangladesh. Bangladesh Horticulture. 3(2) : 28-32.
- Samad, M. A. and A. H. M. Faruque. 1976. A study on the physical characteristics of some common mango varieties of Bangladesh. Bangladesh Horticulture. 4(1) : 18-23.