MORPHOLOGICAL STUDIES OF UNDERUTILIZED FRUITS

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ABSTRACT

The morphological study of five selected minor fruit viz. aonla (NA-6 and NA-7), bael (NB-5 and NB-9), ber (Karaka and Umran), jackfruit (NJ-2 and NJ-3) and kaitha (K-1 and K-2) carried out in NDUAS&T Kumarganj Ayodhya. The present study further indicated that variation in shape, colour and pulp colour of minor fruit germplasms were showed from oval to round (fruit shape), light green with yellowish (fruit colour) and whitish to greenish (pulp colour) in aonla, oblong to globose (fruit shape), brownish to yellowish (fruit colour) and yellowish (pulp colour) in bael, oval to round (fruit shape), greenish yellow to yellow (fruit colour) and whitish to yellowish crispy (pulp colour) in Ber, round to oval (fruit shape), grayish to white (fruit colour) and brownish, mealy (pulp colour) in kaitha and oblong (fruit shape), greenish brown (fruit colour) and bright, yellow (pulp colour) in jackfruit.

Keywords: Colour, Flesh Colour, Shape and Underutilized fruits

INTRODUCTION

Underutilized fruit crops refer to those fruits which may be high in value but that are not widely grown. They are nutritionally important but rarely used by human. People are not aware of its nutritional importance. In a general sense, these fruits are consumable by those who are accustomed to consume underutilized fruit. These fruits are known as minor fruit crops. In India, aonla (Emblica officinalis) cultivars, i.e. Banarasi, Chakaiya, Francis, Kanchan, Krishna, NA-6, NA-7 and NA-10, harvested at full maturity. NA-7 was recorded the highest average fruit diameter (Singh et al., 2003). Physicochemical analysis of wood apple revealed that the average fruit weight ranged from 140.08 to 256.65 g, fruit length and width from 6.50 to 8.40 cm and 6.16 to 7.43 cm respectively, volume of fruit from 81.66 to 248.50 cc, specific gravity from 1.04 to 1.74, shell thickness from 0.30 to 0.20 mm and pulp weight from 60.33 to 176.00 g, number of seeds per fruit from 260.50 to 471.66, seed weight per fruit from 8.83 to 15.66 g, seed weight percentages from 86.04 to 91.76 and pulps seed ratio from 7.60:1 to 12.30:1 (Pandey et al., 2013).

MATERIALS AND METHODS

The present investigation was carried out at laboratory of Department of Biochemistry, Acharya Narendra Deva University of Agriculture and Technology Narendra Nagar Kumarganj Ayodhya (U.P.) India, conducted during 2013-14 and 2014-15. The five underutilized fruit germplasms/varieties namely Aonla (NA6 and NA7), Bael (NB5 and NB9), Ber (Karka and Umran), Jackfruit (NJ2 and NJ3) and Kaitha (K1 and K2) which had been collected from Horticulture Nursery. The samples from each fruit used to studies on morphological variability of the underutilized fruits.
1. Shape of fruits:

Five fruits from each varieties aonla (NA-6 and NA-7), bael (NB-5 and NB-9), ber (Karaka and Umran), jackfruit (NJ-2 and NJ-3) and kaitha (K-1 and K-2) were randomly selected for the measurement of fruit-shape. The shapes of these fruits were measured with the help of vernier callipers scale.

2. Colour of fruits:

The colour of fruit was recorded by visual observation by selecting five fruits randomly from each variety.

3. Colour of Flesh/Pulp:

The colour of flesh was recorded by visual observation by selecting five fruits randomly from each variety.

RESULTS AND DISCUSSION

It can be inferred from the table that the shape, colour and pulp colour of NA-6 and NA-7 was found oval to round (fruit shape), light green with yellowish (fruit colour) and whitish to greenish (pulp colour), NB-5 and NB-9 were found oblong to globose (fruit shape), brownish to yellowish (fruit colour) and yellowish (pulp colour). Ber-K and Ber-U were observed that oval to round (fruit shape), greenish yellow to yellow (fruit colour) and whitish to yellowish crispy (pulp colour). The shape, colour and pulp colour of K-1 and K-2 were showed that round to oval (fruit shape), grayish to white (fruit colour) and brownish, mealy (pulp colour). NJ-2 and NJ-3 were showed that oblong (fruit shape), greenish brown (fruit colour) and bright, yellow (pulp colour) during 2013-14 and similar result were showed in 2014-15. Similar results were witnessed by Venudevan and Srimathi (2013) in bael (Aegle marmelos L.) fruits were categorized based on the colour into three different groups as green, greenish yellow and yellow. Kenghe and Potdar (2009) found in bael fruit that fruit shape varied from flat, spherical, pear and near cylindrical in bail fruits. Yadav et al. (2005) also supported in ten Ziziphus Mauritiana cultivars, most of the mature fruits were light green, although yellowish green and dark green to green mature fruits were also observed. Ripe fruits were chocolate brown, golden yellow or greenish yellow to yellow. Bhosale et al. (2006) observed the fruit colour varied with the cultivar NA-7 appeared to be promising for most of the chemical parameters. Randhawa and Biswas (1966) reported that fruit shape in cultivar Umran was large, elliptical with golden yellow colour having round base and apex. Pandey et al. (2013) also reported that the fruit of kaitha was a hard-shelled many seeded berry with its pinkish brown. Goswami et al. (2011) found that the pulp colour of two jackfruit cultivar, Khaja fruits were whitish yellow whereas that of Ghila pulps were deep yellow.

Table 1: Shape, Colour and Flesh Colour of underutilized fruit germplasms.

<table>
<thead>
<tr>
<th>Germplasms</th>
<th>Shape of fruit</th>
<th>Colour of fruit</th>
<th>Flesh/pulp Colour of fruit</th>
<th>Shape of fruit</th>
<th>Colour of Fruit</th>
<th>Flesh/pulp Colour of fruit</th>
</tr>
</thead>
<tbody>
<tr>
<td>NA-6</td>
<td>Oval To Round</td>
<td>Light Green With Yellowish</td>
<td>Whitish To Greenish</td>
<td>Oval To Round</td>
<td>Light Green With Yellowish</td>
<td>Whitish To Greenish</td>
</tr>
<tr>
<td>NA-7</td>
<td>Oval To Round</td>
<td>Light Green With Yellowish</td>
<td>Whitish To Green</td>
<td>Oval To Round</td>
<td>Light Green With Yellowish</td>
<td>Whitish To Green</td>
</tr>
<tr>
<td>NB-5</td>
<td>Oblong To Globose</td>
<td>Brownish To Yellowish</td>
<td>Yellowish</td>
<td>Oblong To Globose</td>
<td>Brownish To Yellowish</td>
<td>Yellowish</td>
</tr>
<tr>
<td>NB-9</td>
<td>Oblong To Globose</td>
<td>Yellowish To Brownish</td>
<td>Yellowish</td>
<td>Oblong To Globose</td>
<td>Yellowish To Brownish</td>
<td>Yellowish</td>
</tr>
<tr>
<td>BER-K</td>
<td>Oval To Round</td>
<td>Greenish Yellow To Yellow</td>
<td>Whitish To Yellowish, Crispy</td>
<td>Oval To Round</td>
<td>Yellowish To Greenish</td>
<td>Whitish To Yellowish, Crispy</td>
</tr>
<tr>
<td>BER-U</td>
<td>Oval To Round</td>
<td>Greenish Yellow To Yellow</td>
<td>Whitish To Yellowish, Crispy</td>
<td>Oval To Round</td>
<td>Yellowish To Greenish</td>
<td>Whitish To Yellowish, Crispy</td>
</tr>
<tr>
<td>K-1</td>
<td>Round To Oval</td>
<td>Grayish To White</td>
<td>Brownish, Mealy</td>
<td>Round To Oval</td>
<td>Grayish To White</td>
<td>Brownish, Mealy</td>
</tr>
<tr>
<td>K-2</td>
<td>Round To Oval</td>
<td>Grayish To White</td>
<td>Brownish, Mealy</td>
<td>Round To Oval</td>
<td>Grayish To White</td>
<td>Brownish, Mealy</td>
</tr>
<tr>
<td>NJ-2</td>
<td>Oblong</td>
<td>Greenish Brown</td>
<td>Bright, Yellow</td>
<td>Oblong</td>
<td>Greenish Brown</td>
<td>Bright, Yellow</td>
</tr>
<tr>
<td>NJ-3</td>
<td>Oblong</td>
<td>Greenish Brown</td>
<td>Bright, Yellow</td>
<td>Oblong</td>
<td>Greenish Brown</td>
<td>Bright, Yellow</td>
</tr>
</tbody>
</table>
CONCLUSION

Variation in shape, colour and pulp colour of minor fruit germplasms were showed from oval to round (fruit shape), light green with yellowish (fruit colour) and whitish to greenish (pulp colour) in Aonla, oblong to globose (fruit shape), brownish to yellowish (fruit colour) and yellowish (pulp colour) in Bael, oval to round (fruit shape), greenish yellow to yellow (fruit colour) and whitish to yellowish crispy (pulp colour) in Ber, round to oval (fruit shape), grayish to white (fruit colour) and brownish, mealy (pulp colour) in Kaitha and oblong (fruit shape), greenish brown (fruit colour) and bright, yellow (pulp colour) in Jackfruit.

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REFERENCES


Arora, R.K. (1998). Genetic resources of native tropical fruits in Asia: Diversity, distribution and IPGRI's emphasis on...


