Studies on evaluation of recipe for preparation of quality aonla products

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Abstract: Aonla fruits used for experiments were harvested at maturity and collected in polythene bag from Main Experimental Station, Horticulture. The investigation comprised of four experiments. One kg mature fruit of each cultivars as Banarasi and Krishna were replicated three times, taken for assessing the recipes for the preparation of different aonla products (Syrup, Jam, Candy and Preserve) to evaluate the organoleptic quality of each cvs. The recipe No. 3 was adjudged to be the best for jam, however recipe No. 4 was best for syrup, whereas the recipe No. 5 was judged for both candy and preserve in both the years (2004-05 & 2005-06).

Key words: Gooseberry, TSS, Acidity, Pulp, Syrup, Jam, Candy and Preserve

Introduction

The Indian gooseberry (Emblica officinalis Gaertn.) is an important indigenous and minor fruit, belongs to the family Euphorbiaceae and sub family Phyllathoidae. Naturally growing aonla has been reported from Cylon, Cuba, Puerto Rico, Hawaii, Florida, Iran, Iraq, Java, West Indies, Trinidad, Pakistan, Malaya and China (Benthal, 1946). Aonla is the second richest source of Vitamin-C (600 mg/100 g pulp) among the fruits, after Barbados cherry and a few fruit can be the daily requirement of vitmain ‘C’ (Shankar, 1969). It contains 788 mg of ascorbic acid per 100g of pulp (Singh et al., 1994). This is much more than vitamin C content of guava, citrus and tomato fruits. The fruit juice contains nearly 20 times as much vitamin C as in organic juice. The importance of this fruit is also due to its high content of tannin i.e. gallotanic acid which on hydrolysis yields gallic acid. The gallic acid present in aonla fruit has antioxidant property. The stability or retention of vitamin C in aonla products due to these gallic acid or polyphenol is a matter of great concern for processors. Fruit is also a fair source of carbohydrates, carotene, thiamin, riboflavin and minerals. Aonla may be an important fruit of 21th century due to its high medicinal and nutritional value, high productivity per unit area, suitability to various kinds of wasteland and potentiality for processing in to quality products, which has tremendous potential for export to different countries. Aonla product is expected to rise phenomenon in the future providing exciting opportunities for the processing sector.

It can be grown under wider edapho-climatic situations; well drained fertile loamy and moderately alkaline soils are the best for its cultivation. The commercial cultivation of aonla is expanded from the ‘Home Land’ of Uttar Pradesh to almost all the states of India, including Maharashtra, Gujarat, Rajasthan, Madhya Pradesh, Jharkhand, Chhattisgarh, Andhra Pradesh, Karnataka, Haryana, Punjab and Himanchal Pradesh. In Uttar Pradesh, Pratapgarh has been declared as aonla fruit belt and Agri-export zone. Fruit pulp of Indian gooseberry is an important ingredient of Chyawanprash and Triphala powder. Despite high nutritional profile of aonla, it has very limited table value. The high degree of astringency of fruit pulp leaves little scope for its fresh consumption. Hence, it is processed in to various products viz. Preserve (Murabba), pickle, chutney, which is most important conventional processed products. Besides, technologies for juice, segment in syrup, candy supari, freeze dried aonla and churan need to be developed. Some work in this direction has been reported by Tandon and Kumar (2005).

Materials and Methods

The present investigation was carried out in laboratory of post harvest technology of department of horticulture, C.S. Azad University of Agriculture and Technology, Kanpur and Government Community Fruit Preservation and Canning Centre, Kanpur during the year 2004-05 and 2005-06. Aonla fruits used for experiments were harvested at maturity and collected in polythene bag from Main Experimental Station, Horticulture. The investigation comprised of four experiments. One kg mature fruit of each cultivars replicated three times were taken for assessing the recipe for the preparation of aonla products. The following recipes of Syrup, Jam, Candy and Preserve were prepared and evaluated for organoleptic quality in both the years (2004-05 & 2005-06). The statistical analysis of variance of data was carried out by the method described by Raghuramula et al. (1983).

Results and Discussion

Jam: Data were presented in table-1 shows that effect of recipe on organoleptic quality of Jam prepared from two cultivars was found to be significant. Aonla Jam was prepared by taking 45 per cent pulp, with varying levels of TSS and acidity. Among them recipe No.3 containing 45 per cent pulp, 68 per cent TSS and 0.50 per cent acidity was adjusted to be the best for Banarasi and Krishna cvs. Jam contained at least 45 per cent acidity and inversion should not be more than 41 per cent (F.P.O. 1955). Recipe No. 2 was found with minimum organoleptic score. Bhat et al. (1982) reported at least 68 per cent total soluble solids for Jam, Lal et al. (1986) and Singh (1999) suggested one kg pulp, 750g sugar, 100ml. water and 2g citric acid, while 1 kg pulp 700 g sugar, 3g citric acid and 100 ml water was suggested by Dhawan and Gupta (1989) for preparation of...
papaya Jam. Pathak et al. (2005) reported recipe for aonla jam preparation as 1 kg pulp, 750g sugar and 2 g citric acid. Prasad and Moli (2006) reported preparation of Jam with at least T.S.S. 68°Brix and 0.75% acidity with a pH of 3.08 in Ber.

**Syrup:** Aonla syrup of both the varieties - Krishna and Banarasi was prepared by mixing pulp, sugar and acid. Among various recipes No. 4 with 25 per cent juice, 65 per cent TSS and 1.3 per cent acidity was adjudged to be the best which might have been due to proper or suitable TSS/acid ratio in the recipe of aonla syrup. Anonymous (1957) reported that jamun, phalsa, pomegranate and grape can be utilized for making of thick syrup. Approximately 64 per cent total soluble solids were suggested by Tressler and Joslyn (1971) for cherry syrup. Ambadan (1973) reported the composition of phalsa syrup, which contains 1 litter juice, 1 kg sugar, 10g citric acid and 1.5g sodium benzoate. Jagtiani (1980) reported the formulation of aonla syrup. Among various recipes the recipe No.4 with 25 per cent juice, 65 per cent TSS and 1.3 per cent acidity was adjudged to be the best which might have been due to proper or suitable TSS/acid ratio in the recipe of aonla syrup. Further, Ashraf (1987) reported recipe for syrup of Jamun.

**Candy:** Aonla candy is prepared by mixture of pulp, sugar and glucose and subsequently drained and dried is candied fruit. Among various recipes the recipe No.5 containing 55 per cent sugar syrup, 68 per cent TSS and 0.2 per cent acidity was found to be best for candy preparation of both the varieties, which may be due to the balanced ingredients in the preparation of aonla candy. Recipes for making aonla candy have been suggested by Singh (1984) in aonla. The fig, ber and ginger are ideally suited for making of candy. Candy contained, approximately 70 per cent soluble solids (F.P.O 1955), while 75 per cent total soluble solids was reported by Arya and Rastogi (1984), Lal et al. (1986) and Kumar (1990). Bhat et al. (1982) described the techniques for preparation of petha candy. The recipe contained 1 kg peeled slices, 1.25 kg sugar, 1.25 liter water, 60 g lime, 1 to 2 g citric acid and sufficient amount of colour. Singh and Pathak (1987) reported aonla fruit can be utilized for making excellent quality of candy or intermediate moisture food (IMF). Pathak (1988) described the technology for preparation of aonla candy. The recipe contained 1kg aonla fruit, 1 kg sugar and 1.5 liter water.

**Preserve:** Among various recipe used in the present study, the recipe No. 5 containing 55 per cent sugar syrup and 68 per cent TSS was noted with best sensory score for making preserve of both the aonla cultivars. Preserve approximately, 1 kg of fruit, 1 liter of water, 1 sugar and a little quality of citric acid is added during the preparation to prevent crystallization of the sugar syrup (F.P.O 1955). Damame et al. (2002) reported that aonla preserve appeared as a source of vitamin C. All the dehydrated and preserve products received acceptable sensory scores.

### Table-1: Organoleptic quality of different recipes of aonla Jams

<table>
<thead>
<tr>
<th>Recipe No.</th>
<th>Pulp (%)</th>
<th>TSS (%)</th>
<th>Acidity (%)</th>
<th>2004-05</th>
<th>2005-06</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Score</td>
<td>Rating</td>
<td>Score</td>
<td>Rating</td>
<td>Score</td>
</tr>
<tr>
<td>1</td>
<td>7.19</td>
<td>LM</td>
<td>7.80</td>
<td>LM</td>
<td>7.40</td>
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<tr>
<td>2</td>
<td>6.80</td>
<td>LS</td>
<td>6.90</td>
<td>LS</td>
<td>8.20</td>
</tr>
<tr>
<td>3</td>
<td>8.40</td>
<td>LVM</td>
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<td>LVM</td>
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</tr>
<tr>
<td>4</td>
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<td>LVM</td>
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</tr>
<tr>
<td>5</td>
<td>7.90</td>
<td>LM</td>
<td>7.90</td>
<td>LM</td>
<td>8.00</td>
</tr>
<tr>
<td>6</td>
<td>7.60</td>
<td>LM</td>
<td>7.60</td>
<td>LM</td>
<td>7.60</td>
</tr>
<tr>
<td>CD at 5%</td>
<td>0.847</td>
<td>1.46</td>
<td>0.478</td>
<td>0.828</td>
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</tr>
</tbody>
</table>

### Table-2: Organoleptic quality of different recipes of aonla Syrup

<table>
<thead>
<tr>
<th>Recipe No.</th>
<th>Pulp (%)</th>
<th>TSS (%)</th>
<th>Acidity (%)</th>
<th>2004-05</th>
<th>2005-06</th>
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</thead>
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<td>Score</td>
<td>Rating</td>
<td>Score</td>
<td>Rating</td>
<td>Score</td>
</tr>
<tr>
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<td>7.80</td>
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<td>LM</td>
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</tr>
<tr>
<td>3</td>
<td>6.90</td>
<td>LS</td>
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<td>LS</td>
<td>6.80</td>
</tr>
<tr>
<td>4</td>
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<td>LVM</td>
<td>8.20</td>
<td>LVM</td>
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<tr>
<td>5</td>
<td>7.90</td>
<td>LM</td>
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<td>7.60</td>
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<td>6</td>
<td>7.60</td>
<td>LM</td>
<td>7.40</td>
<td>LM</td>
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</tr>
<tr>
<td>CD at 5%</td>
<td>0.571</td>
<td>0.989</td>
<td>0.208</td>
<td>0.360</td>
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</tr>
</tbody>
</table>

LM- Like Moderately; LS- Like Slightly; LVM- Like Very Much; NLND- Neither Like nor Dislike
It can be concluded that the recipe and technique for preparation of value added products viz., Jam, Syrup, Candy and Preserve were standardized to utilize the fruit for processing. In general TSS, acidity and browning increased while ascorbic acid and organoleptic quality score decreased in varying degree in different aonla products during storage. The cultivar Banarasi proved superior to Krishna irrespective of the value added products made.

Acknowledgement

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References