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Development and organoleptic evaluation of mixed fruit leather from bael and Aonla pulp

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Abstract

Bael and Aonla comes under the category of highly nutritious fruits with a high therapeutic value. Blending of pulp was undertaken in order to prepare a product rich in vitamins, minerals and antioxidants. Preparation of bael and aonla blended leather is low cost technique because being underutilised these fruits are cheaper in the market. Bael fruit is not used commonly so, efforts were made to prepared leather from 100% bael and Bael: Aonla combination at various ratios with the addition of 30 % sugar. The aonla pulp were added to bael in the ratio of T1 (30%), T2 (40%), T3 (50%). The leather was prepared and well dried. The resultant leather was evaluated for its sensory quality on 9 point hedonic scale to decide best quality leather. The sensory level ranked the best product at 50% level of aonla pulp and 50% of bael pulp with respect to color, flavour, texture and overall acceptability.

Keywords: Bael, Aonla, leather, organoleptic evaluation

Introduction

Fruit leathers are dehydrated sheets of fruit purees or a mixture of fruit juice concentrates and other ingredients with high nutritive value and organoleptic properties (Madasanka *et al.*, 2016) [8]. Fruit leather can be made from a wide variety of fruits, such as apple, apricot, banana, blackcurrant, cherry, grapes, peach, pear, pineapple, fig, mango, strawberry, papaya, sweet potato, chiku and jackfruit (che-man and Sin. 1997) [3].

Fruit leathers are dried sheets of fruit pulp that have a soft, rubbery texture and sweet taste. They are produced by dehydrating of fruit puree into a leathery sheet (Rab and Oehler, 1999) [12]. The edible portion of fruit is pureed, mixed with other ingredients to improve its physicochemical and sensory characteristic's, heated formed (flattened and shaped) and then dried on a flat trays until a cohesive fruit leather is obtained (Moyal, 1981) [13].

The preservation of fruit leather depends on their low moisture content (15-25%) the natural acidity of fruit and high sugar content. Major quality parameters associated with dried fruit products, in no particular order, are change of color/visual appeal, flavour, shape, texture shelf life, microbial load, retention of nutrients, porosity of bulk density, rehydration properties, water activity, chemical stability and contaminants (Parera, 2005) [14].

Bael a member of family Rutaceae and sub family aurantioidease is native to India with its abundance in Himalayan tract, Bengal, central and south India (Sharma and Chauhan 2017) [17], mostly found in tropical and sub-tropical areas. Most of the parts of the tree like root, stem, bark, leaf, flower and fruit at every have medicine related advantages at every maturing stage (Maity *et al.*, 2009) [9] and leaves, fruits and seed have hypoglycaemic, hypo lipidemic and blood pressure lowering properties (Lmbole *et al.*, 2010) [7].

The unripe bael fruit are used for pharmaceutical use, therapeutic use and preparation od jams, marmalade and syrups (ITDG, 2000) [6]. Bael is considered to be one of the richest sources of riboflavin and provides lots of minerals and vitamins to diet. Bael fruit is having anti-micro filarial activity, anti-fungal activity, anti-inflammatory, antipyretic, analgesic, anti-proliferative activity (Neeraj and Jekar, 2017) [11], also can be used for treating diarrhoea, dysentery, constipation, peptic ulcer, respiratory affections (Sampath Kumar *et al.*, 2012) [16].

Aonla (*Embalica officinalis*) also known as Indian gooseberry (Barwal *et al.*, 2009) [1] is one of the traditional fruits indigenous to India and is considered as " wonder fruit for health" (Ganachari *et al.*, 2010) [5]. Aonla, a member if family Euphorbiaceae and sub family phylanthiodae and is native to India, Ceylon, Malaya and China (Mishra *et al.*, 2010) [10]. Aonla is quite hardy, a prolific bearer and highly remunerative even without much care.

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It can be grown easily on calcareous and slightly saline as well as alkaline soils, where common fruit crops do not thrive (Pareek and Kitinoja, 2011) [15].

Aonla fruit is having antiscorblic, diuretic, laxative, and alternative antibiotic properties, used in treating jaundice and cough (Burkill, 1935) [2]. Aonla is one of the richest sources of vitamin C and of polyphenols, and these polyphenols are considered to have a high medicinal value. As a result, the fruit has acquired an important therapeutic role in the Ayurvedic and Unani systems of medicines (Tripathi et al., 1979) [18]. Murrabas, juice, jam, cheese, candy, powder, beverage, chutney are the different types of aonla products available in the market and preferred by the consumer being the richest sources of Vitamins and anti-oxidants.

Bael and Aonla comes under the category of highly nutritious fruits with a high therapeutic value. Both of these fruits are known for their therapeutic medicinal and nutritive properties. Blending of pulp was undertaken in order to prepare a product rich in vitamins, minerals and nutritive properties. Blending of bael and aonla pulp could be of great economic as well as nutritional and therapeutic value.

Materials and Methods

Materials:

The raw materials utilised during present investigation like bael fruit, aonla fruits, sugar and packaging material were procured from local market of Parbhani, Maharashtra.

Organoleptic evaluation of leather:

The prepared mixed fruit leather was evaluated for sensory characteristics like color, flavour, texture, consistency and overall acceptability by 5 semi-trained panel members comprised of academic staff members of department of food Engineering, college of Food Technology, VNMKV, Parbhani. Judgment was made through rating of products on a 9 point Hedonic scale with corresponding descriptive terms ranging from 9 'Like Extremely' to 1 'Dislike Extremely'.

Method of Preparation:

• Preparation of pulp

Mature ripened bael fruits were washed and their rinds was broken by striking them against a hard object. Pulp was extracted as per the method standardized by Roy and Singh (1979b) [18, 19]. Pulp was preserved with 500ppm KMS followed by packing in double layered polyethylene bags and stored in deep freezer at -18 °C.

• Preparation of fruit leather

Pulp of aonla were blended in different proportions and sugar added (Table 1) and pulp was dried at 60±5 °C. Pure bael and aonla leather were also prepared for comparative study.

Table 1: Treatment table

Treatments	Bael	Aonla	Sugar
T0	100%	-	30%
T1	70%	30%	30%
T2	60%	40%	30%
T3	50%	50%	30%

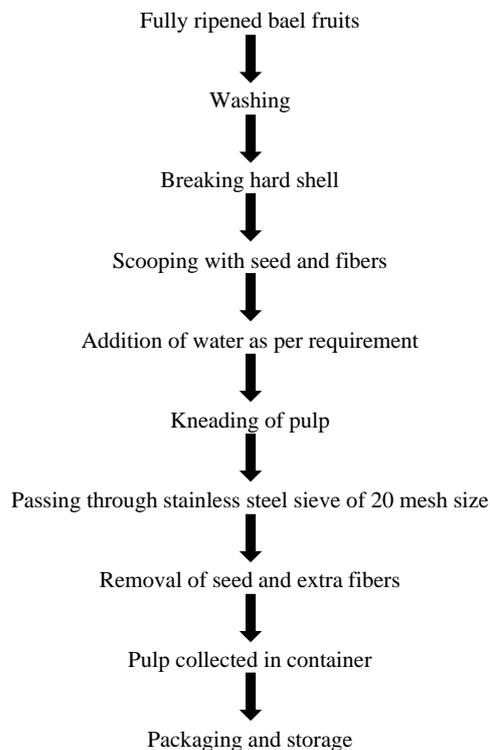


Fig 1: Flow chart for bael pulp extraction

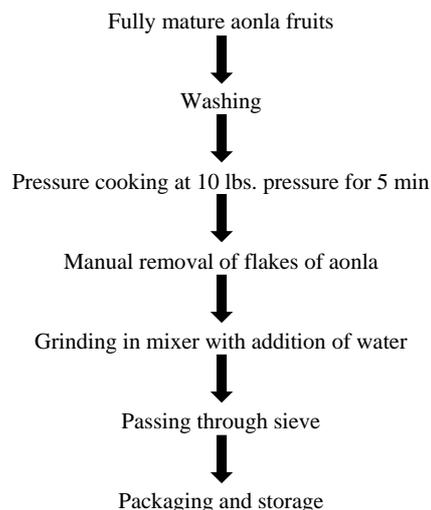


Fig 2: Flow chart for preparation of aonla pulp

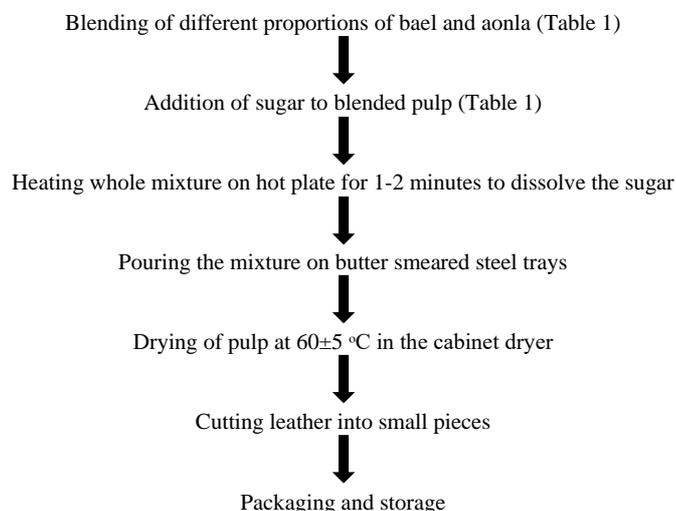


Fig 3: Flow chart for preparation of bael: aonla fruits leather

Result and Discussion

Sensory evaluation of prepared mixed fruit leather

Data pertaining to sensory evaluation of prepared mixed fruit leather with respect to color, flavour, taste, texture, mouth feel

Samples	Appearance	Color	Flavour	Taste	Texture	Overall Acceptability
T ₀ (100%)	8.7	9	8.2	8.5	8.5	8.6
T ₁ (70:30)	7.0	7.6	7.9	8.1	7.6	7.6
T ₂ (60:40)	7.5	8.0	7.6	7.2	7.5	7.5
T ₃ (50:50)	8.5	8.7	8.02	8.5	7.8	8.3
SE±	0.154	0.136	0.108	0.155	0.123	0.157
CD at 5%	0.453	0.444	0.354	0.507	0.403	0.473

Data indicated in above table: 2 showed that Sensory evaluation of prepared bael and aonla mixed fruit leather was analysed by semi trained panalist of college of food technology. Panelist scored the highest for T₃ in color (8.7), flavor (8.02) and texture (7.8) in appearance (8.5) and its taste was recorded 8.5. The least score (7) was recorded for T₁. It is revealed from organoleptic evaluation that panellist had preferred control sample in appearance and color, but they equally preferred the taste and texture of control along with that of T₃.

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were carried out. Accordingly, results obtained depicted in table 2.

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