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Organoleptic evaluation of aonla (Murabba) for income generation through farm women

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Abstract
Aonla *(Emblica officinalis Geartn)*, the king of arid fruits, popularly known as "Indian gooseberry", is a small-sized minor subtropical fruit grown widely in North India. India ranks first in the world in aonla area and production volume. It is considered to be a "wonder fruit for health" because of its unique properties. Aonla fruit is very useful in treating many diseases such as diabetes, cough, asthma, bronchitis, headache, dyspepsia, colic, flatulence, skin diseases, leprosy, jaundice, scurvy, diarrhea and cancer, but the aonla products like candy, supari, pickle, murraba and chavanprash are very famous and have huge demand in the market because of their health benefits. Result revealed that Income generation through aonla murraba net return for Improved practice Rs 5525 per unit production higher as compare to traditional practice. Benefit cost ratio was found superior in improved practice (1.88) as compare (1.33) in traditional practice. Sensory parameters viz., color, texture, flavor, taste and overall acceptability were found superior in improved practice method as compared to the traditional method.

Keywords: Value addition, aonla, murabba, overall acceptability, sensory parameter

Introduction
Aonla, (*Emblica Officinalis* Gaertn.), the king of arid fruits belongs to family Euphorbiaceae, is popularly known as "Indian gooseberry", is a small-sized minor subtropical fruit grown widely in North India (Yadav *et al*., 2017) [9]. India ranks first in the area under production and productivity of aonla or Indian gooseberry (*Emblica officinalis Gaertn*). It belongs to genus Emblica of the family Euphorbiaceae and order Euphorbiales. It is well known Indian fruit for its medicinal and therapeutic properties from the ancient time in India. The chemical composition of fresh fruit in respect to energy 170/40 KJ/Kg, moisture (84.35%), protein (0.88%), Ascorbic acid (571.60 mg/100g), Total sugar (3.11%), Fibre (3.2 gm) Reducing sugars (2.37%), minerals has been reported by lot a of researchers (Goyal *et al*., 2008) [3]. Amalaki (*Emblica officinalis*) i.e. Aonla and its preparations can be used in any type of ill health. It is commonly used in piles, fracture, constipation, vomiting, nausea, diseases related to vision and eye, hick up, fever, jaundice, liver disease, skin disease, diabetes (Kavita, 2013) [4]. Its importance lies in its high richness of vitamin C. It is the second highest source of vitamin C among fruits next only to Barbados cherry. It is prolific and seasonal bearer. Its annual production accounts around 2 lakh metric ton in India (Goyal *et al*., 2008) [3]. It is commercially cultivated in many districts of Madhya Pradesh viz. Mandsaur, Neemach, Ratlam, Jabalpur, Jhabua, Bhopal, Betul, Dewas, Hoshangabad, Chindwara, Sheopur, Tikamgarh, Rewa, etc. Fruits of aonla are highly perishable with limited storage period. The fresh fruits are generally not consumed as it is highly acidic and astringent; therefore it is not so popular table fruit. But, it has got great potential in processed forms since, 17% or more of the produced fruit are lost during transport, storage and marketing (Singh *et al*., 1993) [8]. Therefore, modern technologies are needed to reduce the losses. A study was conducted to evaluate the impact of value addition and economics of preparation of muraba and the overall acceptability for income generation of farm women in district Mandsaur (M.P.).

Materials and Methods
The study was conducted in Mandsaur district of M.P. Two villages *i.e*. Rajakhedi and Richhalalmuha were selected for conducting the On Farm Testing and Front Line Demonstration for preparation of Aonla Murabba (Whole) product. Both the villages are situated in the periphery of 20 and 30 Kms from Krishi Vigyan Kendra, Mandsaur. Aonla growers were identified and 15 farm women were selected randomly. The selected group represented the marginal and small land holding farm women.

The interview schedule and questionnaire was developed to study demographic parameters and extensive review of the value addition training of respondent of villages. Demonstration of value added product of Aonla (Murabba) has been prepared as per norm of FPO specifications. The following equipments and other materials were used for making Aonla Murabba product. Items used are stainless steel fork for pricking of Aonla fruits. Cooking utensils, hand refractometer, measuring cylinder, weighing balance, muslin cloth, glass Jar, sugar, citric acid, alum, cordimum, salt white and chemical preservative- II Sodium Benzoate etc. Preparation of Aonla Murabba from fully mature Aonla (Narendra-7). Product was evaluated for Sensory parameters viz; taste, colour, texture, flavour overall acceptability and shelf life As per *Ranganna*, S. (1978) [6]. Data were analyzed and simple mean percentage were calculated as formula is given below

(1) BC Ratio = Total benefit in Rs / Total cost in Rs.
FP (farmer practice) -
IP (improved practice) -
BCR (Benefit Cost ratio)-
(2) Income increases (%): Output – Input/ Input × 100

$$\text{(3) Additional income (\%)} = \frac{\text{Higher income – lower income}}{\text{Lower income}} \times 100$$

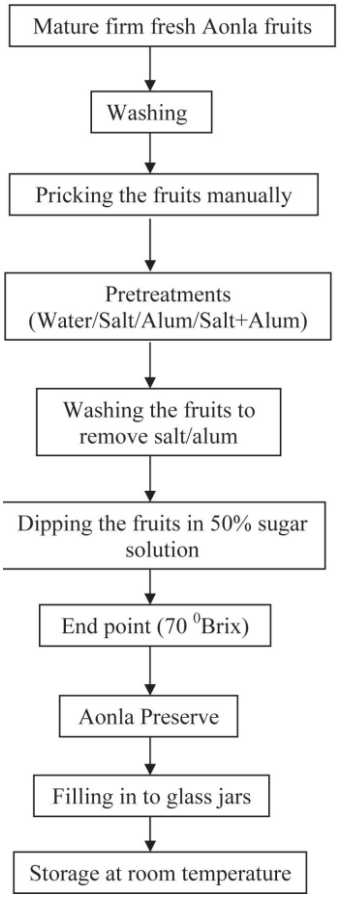

Plate 1: Flowchart for preparation of aonla murabba

Result and Discussion

Demographic Profile of family It was (Table-1) clearly evident that majority (41 %) & (43 %) respectively in both the villages of the participants had formal systems of education up to primary school and had family annual income less than Rs 10,000/-. Similar results are reported by Roy *et al.*, (2013) [7]. It was evident (Table 3) Cost of input per kg was Rs. 615 in farm women traditional practice and Rs. 6275 in improved practice. Improved practice increases production per unit 88.04 %. The net return for Improved practice Rs 5525 per unit production over traditional practice. The benefit cost ratio was found in improved practice (1.88) and (1.33) in traditional practice, The data (Table 4) revealed that sensory parameters viz., colour, texture, flavor, taste and overall acceptability were found superior in improved practice method as compared to the traditional method. Similar findings were reported by Tripathi *et al*. (1988) [10], Patel *et al*. (2014) [5] in aonla product, and Durrani and Verma (2011) [2] in honey aonla murabba.

(1) BC Ratio = Gross profit /Cost of Input
FP = 820/615 = 1.33
IP = 11800/6275 = 1.88
(2) Income increases % - (Gross Profit – Cost of Input/ Cost of Input) × 100
FP - (820-615) /615 × 100 = 33.33 %
IP - (11800-6275) /6275 × 100 = 88.04 %

Conclusion

Value added product of Aonla murraba may increase the income of farm women and it could be a start up for small scale entrepreneur for rural area. The benefit cost ratio was (1.88) found in improved practice and (1.33) in traditional practice, where additional gross profit was increased by 88.04 % compare to traditional method. Farm women earn the money by value addition of anola murraba. The processing can be helpful to control market price fluctuation and losses of aonla fruits through value addition.

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Table 1: Demographic profile of the family

S. No.	Parameters	Villages	
		Rajakhedi	Richhalalmuha
1.	No. of Household	340	507
2.	Gender	Male - 841 Female - 816 Total - 1657	Male - 1244 Female - 1228 Total - 2472
3.	Type of family		
	Nuclear	76 %	74 %
	Joint	24 %	26 %
4.	Literacy level		
	Illiterate	18 %	15 %
	Primary	41 %	43 %
	Middle	22%	26 %
	Higher secondary	19 %	18 %
	Graduate	04 %	03 %
	Post graduate and above	02 %	02 %
5.	Income of the family / month		
	Less than Rs 10000	86 %	84 %
	Rs 10000-20000	12 %	13 %
	Rs 20000-30000	02 %	03 %
	More than Rs. 30,000	01 %	02 %

Table 2: Ingredient used for preparation of Aonla Murabba.

S. No	Ingredient/Particular	Quantity
1.	Aonla (Narendra -7)	45.000 kg
2.	Sugar	67.50 kg
3.	Salt White	01.00 kg
4.	Citric acid	00.045 kg
5.	Alum	00.500 kg
6.	Cardimum	00.090 kg
7.	Sodium Benzoate @ per kg product	50.00 PPM
8.	Glass /Jar	As per need
9.	Utensils	As per need
10.	Labour	As per need
11.	Fuel	As per need
12.	Labels	As per need

Table 3: Economic parameters of processed product of Aonla Murabba.

Particular	FWP	IP
No. of trials	15.00	15.00
No. of farm family involved	15.00	15.00
Output of Production kg/day	45.00	125.00
Cost of produce/kg in (Rs.)	13.66	50.20
Gross profit in Rs.	820.00	11800.00
Net return in Rs.	205.00	5525.00
Income increase (%)	33.33	88.04
Benefit Cost Ratio (BCR)	1.33	1.88

Table 4: Sensory parameter: Organoleptic evaluation of the processed product of Aonla Murabba

Product	Sensory Attributes					
	Colour	Texture	Flavour	Taste	Overall acceptability	Shelf life (days)
(Farmers Practice)	5.40	4.80	6.20	6.00	5.80	6 months
(Improved Practice)	6.90	7.20	6.60	7.60	7.00	12 months

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