

# **New Crops and Uses: Their role in a rapidly changing world**

Edited by **J. Smartt and N. Haq**

**5<sup>th</sup> International Symposium on New Crops and Uses: Their role in a rapidly changing world  
3-4 September 2007, Southampton, UK**

**SPONSORS: University of Southampton, International Science Foundation, ECUC Trust  
National Non-food Crops Centre & Tropical Agriculture Association**

## **Contents:**

### **THE NEED FOR UNDERUTILISED CROPS IN A CHANGING WORLD**

Small scale processing and marketing of underutilised fruits: case study of Amla in India  
*T. Gajanana, I.N.D. Gowda and B.M.C. Reddy*

**Published in 2008 by Centre for Underutilised Crops University of Southampton, Southampton, SO17 1BJ, UK**

All rights reserved. No part of this book may be reprinted or reproduced, or utilised in any form or by any electronic, medicinal or other means, now known or hereafter invented, including photocopying and recording, or in any information storage and retrieval system, without permission in writing from the publisher.

-----  
British Library Cataloguing in Publication Data

-----  
New Crops and Uses: Their role in a rapidly changing world  
Smartt, J.; Haq, N.  
ISBN 9 78 085432 89 18  
-----

# **Small scale processing and marketing of underutilised fruits: case study of Amla in India**

***T. Gajanana, I.N.D. Gowda and B.M.C. Reddy***

The Indian Institute of Horticultural Research, Bangalore, India, under the aegis of the International Centre for Underutilised Crops (ICUC), trained the officials of Bharathiya Agro-Industries Foundation (BAIF), a non-government organization (NGO), on small scale processing and marketing of underutilised fruits in August 2004. As a result, small scale processing units had been established at the village level in Karnata Maharashtra and Gujarat in India for processing underutilised fruits like amla, tamarind and jackfruit into different products. A survey was undertaken after six months of training to evaluate the processing and marketing of underutilised fruit products. The results revealed that small scale processing of amla into raw pickle was found profitable with a net profit of Rs.8/kg of raw pickle. The cost of processing of amla into hot pickle worked out to Rs.50.04/kg of pickle produced. With a price of Rs.60/kg, the processors could realise a net profit of Rs.9.96/kg by preparing amla pickle. The processor's margin was observed to be 19.92 per cent. The cost of producing one bottle (500 ml) of amla squash worked out to Rs.15.01 and with a price of Rs.40/bottle, a bottle of squash could realise a profit of Rs.24.99.

The market survey in Hassan district markets (Karnataka state) indicated that underutilised fruit products like amla pickle were sold by retailers in small quantities. While wholesaling of these products was not found feasible, some retailers expressed their willingness to sell with some conditions: samples to be given, payment after sales, margin of 20-25 per cent and small sized packets. There are conditions which need to be fulfilled to have markets for the products of small scale processing units. The market survey in Pune markets in Maharashtra state indicated that underutilised fruit products like amla pickle, amla squash and amla supari (digestive amla) were already there in the markets though their share was very small. Retailers were willing to market the products of the units with the conditions: samples to be given, good sales after consumer reaction; good quality with reasonable price; small sized packets (200-250 g) with a profit margin of 25-35 per cent. The market survey in Valsad district in Gujarat state indicated the presence of underutilised fruit products like pachan amla (digestive amla), ber powder, salted ber and tamarind candy under different brand names (Oswal, Khelkar, frootlet etc). These accounted for 6-10 per cent of wholesale trade and 11-20 per cent of retail trade indicating thereby the existence of markets for underutilised fruit products. Despite this small share, these products had made their presence felt in the market.

The consumer survey in Pune and Valsad markets indicated that by and large, consumers accepted the quality and price of underutilised fruit products. They preferred amla supari in small sized (10-15 g) sachets in a 100g polythene pouch. However, there was a need to improve labeling. The consumers believed that the label should list the 102 contents, ingredients, best before date, manufacturing date and medicinal value of the product along with the price.

## INTRODUCTION

India enjoys a prominent position in the pomological map of the world. The range of weather conditions in this country provide suitable conditions for growing of a variety of fruits. These fruits are available in abundance and also in different seasons. This has resulted in limited scope for expansion of other minor fruits though they are nutritious, and are the main source of livelihood for the poor. Most of the underutilised fruit of the tropics are often available only in local markets and practically unknown in other parts of the world. A large number of these fruits have the ability to grow under adverse conditions and are also known for their therapeutic and nutritive value. There is a constant market demand all over the world for nutritious and also delicately flavoured new food products. Consumers today are becoming increasingly conscious of the health and nutritional aspects of their food. The tendency is to avoid chemical additives and synthetic foods and obtain therapeutic effects and nutrition from natural resources. Underutilised tropical fruits have an important role to play in satisfying these demands. Many of these fruits are highly perishable and difficult to store in the fresh form. Some of them are not easy to eat out of the hand. A few are not acceptable as a fresh fruit, because of high acidity and/or a strong astringent taste. However, all these fruits have unlimited potential in the world trade in their processed form. This will provide an opportunity for consumers all over the world to enjoy these tropical fruits in the form of processed products. Apart from processing, market potential and energetic campaigning it is necessary to create awareness and consciousness among producers and consumers of the demand for underutilised tropical fruits. Hence, there is a need to concentrate on research efforts on diversification and popularisation of such underutilised fruit crops. In order to achieve this goal, there is a need to create a demand for such fruit crops in domestic and international markets. This, to some extent, can be facilitated through developing suitable processing and marketing of underutilised fruits.

Keeping the above in view, market research has been initiated in three resource centres of Bharathiya Agro-Industries Foundation (BAIF), a non-government organization, located in three different states namely, BIRD\_K, Tiptur, Karnataka, Central Research Station (CRS), BAIF, Urali Kanchan, Pune, Maharashtra and DHRUVA-BAIF, Kaparada, Gujarat. Training of the officials of BAIF from these centres had been organised under the aegis of the International Centre for Underutilised Crops (ICUC), UK, Indian Institute of Horticultural Research (IIHR) and BAIF at IIHR Bangalore during August 3-6, 2004 on *small scale processing and marketing of underutilised fruits*. These officials had in turn trained the women self-help groups (SHG) in their respective centres and community processing units have also been established in different villages. In addition to production of underutilised fruit products, markets for these products had to be identified and linkages with potential markets had to be established. The specific objectives of market research are:

- Identify the marketable products from underutilised fruit species like amla;
- Identify the existing marketing channels for amla products;
- Identify the potential markets and market related problems for amla products;
- Work out the economics of small scale processing of amla.

## DATA AND METHODOLOGY

The data on equipment used for processing, cost of raw material, cost of ingredients used in processing amla products were collected from the respective community level processing units. Using the amortisation technique, monthly establishment cost was worked out. Based on the quantity sold and the price realised, gross returns and net returns were estimated. A market survey was conducted in the local and district markets in the vicinity of the community level processing units in the respective resource centres. For BIRD-K, Hassan district market was selected for the market survey. For CRS, Pune, Pune market was selected. Kaparada, Dharmapur local markets and Valsad district market were selected for the DHRUVA resource centre. The products sold by the wholesalers and retailers were enumerated and the share of the different underutilised fruit products like pickles, jams, squash, chunda, chutney etc in the respective markets was estimated. Similarly, the share of different brands in respective markets was also estimated. A consumer survey of underutilised fruit products produced by the respective community level processing units was conducted by resource centres in the local markets.

## RESULTS

### Resource Centre, BIRD-K, Tiptur

#### *Small scale processing of amla*

After undergoing training on small scale processing of underutilised fruits at IIHR, Bangalore (jointly organised by ICUC, IIHR and BAIF), six officials of BIRD-K have, in turn, trained women SHG members in the area and have been able to establish a community village level fruit processing unit in Balehalli. The processing unit has so far produced two amla products namely, Amla Hot Pickle and Amla Raw Pickle besides one tamarind product, Tamarind Tokku (Chutney) and of late, the processing unit has also started processing jack fruit as chips and papad.

#### *Market survey for underutilised fruit products*

Pickles market: Among pickles, citron (32%), mixed (29%), mango (25%) lemon (9%), amla (4%) and karvanda (0.5%) were found to be popular in the retail market (Table 1).

Table 1. Share of different types in the retail pickle market, Hassan

SI NO	Types	Share (%)
1	Amla pickle	3.90
2	Karvanda	0.43
3	Citron	32.39
4	Mango	25.35
5	Lemon	9.21
6	Mixed	28.71
	Total	100 (72.29)

Note: Figures in parentheses indicate total quantity sold in a month in kg.

Retailer's margin: On an average, the retailers sold about 72.29 kg of different brands of pickles in a month. The retailers' margin ranged from 10 to 13 per cent for Mother's and MNP, 16 per cent for Priya. The retailers' margin for locally popular brands of Krupa and LMP was 60 to 70 per cent. The margin was around 48 per cent for the A-1 brand of pickles.

#### *Consumer attitudes with regard to product brands*

- A pet jar of 300 g was preferred by urban consumers while villagers preferred small packets of 100-250 g;
- There is a preference for good quality and reasonable price by village consumers;
- Local brands Krupa and LMP were preferred by the latter;
- Urban consumers preferred branded and relatively costly pickles like Priya and Mother's.

#### *Conditions for selling new brands/products – Amla pickle*

- Samples to be given to test the consumer preference;
- Payment after sales of the products;
- A margin of more than 16 per cent is required;
- Pickles should be cheaper as the target group is mainly of villagers.

Consumer survey: Regarding pickles, most consumers stated that they buy mango and lime pickles from the market. However, pickles of underutilised fruits like citron, amla, karvanda and amtekai (ambada – pickle is prepared when the fruit is tender) are prepared in their home during the season and hence are the market.

#### **Resource Centre, CRS, BAIF, Uralikanchan,**

##### *Small scale processing of amla*

Amla is available at CRS, BAIF, and Urali Kanchan was the main source of raw material for community processing of amla at the village level. However, in order to supplement raw material, about 500 kg of amla was procured from Rajasthan. Amla was processed into six products namely Amla Candy, Amla Squash, Amla Murabba, Amla Pickle, Amla Supari and Amla Mukhshudhi (Mouth Fresheners).

##### *Marketing of Amla products*

Marketing channels: CRS, BAIF has facilitated the marketing of amla products produced by community processing units through a cooperative of Women SHG namely Sankalpa Streewadi Sahakari Sanstha (SANKALPA) and the products are sold under the brand name of **SANKALPA**. In addition, other cooperative retail outlets such as **Vrindavan** and **Savithri** have also been used for marketing amla products. The marketing channels used by the Producers (Processors) of amla are as below:

1. *Producer (Processor) → Village SHGs*
2. *Producer (Processor) → Sankalpa (Coop) → Consumers*
3. *Producer (Processor) → Sankalpa (Coop) → Retailer \_ Consumers*
  - 3.1 *Producer (Processor) → Sankalpa (Coop) → Vrindavan Outlet (Retailer) → Consumers*
  - 3.2 *Producer (Processor) → Sankalpa (Coop) → Savithri Outlet (Retailer) → Consumers*

Sankalpa: Sankalpa Streewadi Sahakari Sanstha (Sankalpa Women Cooperative Society) is a cooperative of women SHGs. Naturally processed herbal and other products – Herbal Tea Powder, Nirgundi oil, face pack, hair oil, body pack, tulsi powder; food products - papad semiya malt, chivda, chutneys and masalas; allied products like white phenyl, incense sticks, liquid soap, scent, room fresheners, broom and chalk sticks produced by SHG women are sold through this cooperative. Of late, processed underutilised fruit products like amla candy, amla pickle, amla squash, amla murabba, amla supari and amla Mukhshudhi (mouth freshener) are also sold through this outlet under the brand name 'SANKALPA'. Sankalpa charges a commission of 15 per cent on the products sold through its outlet.

Vrindavan: It is an outlet of BAIF, Pune. The products of Vasundhara in Gujarat and Rajasthan and those of Sankalpa are sold through this outlet. An agreement has been reached between Sankalpa and Vrindavan according to which the Vrindavan outlet charges a commission of 7.5 per cent for the products of Sankalpa.

Savitri: It is an outlet of Savitri Mahila Audyogik Sahakari Sanstha (women entrepreneurs' Cooperative Society) which sells the products of all women associations. Sankalpa being the cooperative of women SHGs, its products are also sold through this outlet and Savitri charges a commission of 5 per cent on all the products sold.

*Other channels being explored*

**Producer (Processor) → Sankalpa → Private Retailers (Bakeries/provision stores/Tea Or Sugar Depots) → Consumers**

*Market survey for underutilised fruit products in Pune*

A survey was undertaken in Urali Kanchan and Pune city to ascertain the potential market for underutilised fruit products in general and for amla and tamarind products in particular. Both wholesalers and retailers were contacted for the survey. However, pickles, murabba, candy and juice were sold mostly on a retail basis only and thus, a total of 12 retailers dealing in pickles, squash, murabba, candy and concentrates were interviewed in Pune town with the help of a questionnaire. Bakeries, tea/sugar depots and provision stores were retailers of these items in the survey area.

*Pickle market*

Popular brands: Pravin, Kamadhenu, K-Pra, Sankalpa, Maharaja, Nisarga, Bedekar, Mother's recipe, Savitri and Vrindavan are the popular brands of pickles producing mango, lime, amla, chillies, karvanda, bitter gourd and mixed pickles.

The share of different brands of pickle in the retail market: On an average, 96.95 kg of pickle was sold in a month by retailers. Pravin was the preferred brand (52.99%) followed by Kamdhenu (16.50%), Maharaja (10.83%), Vrindavan (4.53%) and Bedekar (4%). Other brands in the market are K Pra, Mother's recipe, Nisarga, Savitri and Kasthuri (Table 2a).

Table 2a. Share of different brands in the retail pickle market (%), Pune

SI No	Brands	Share (%)
1	Maharaja	10.83
2	Pravin	52.99
3	Kamadhenu	16.50
4	Bedekar	4.00
5	Mother's recipe	2.32
6	Nisarga	1.93
7	K Pra	3.22
8	Sankalpa	1.55
9	Vrindavan	4.53
10	Savitri	1.18
11	Kasthuri	0.97
	<b>Total</b>	<b>100.00 (96.95 kg/m)</b>

The share of different types of pickles in the retail market: Mango leads the pickle market with more than 63 per cent of the market. Mixed pickle (mango, lime, and chillies) ranks second with around 16 per cent followed by amla pickle (13.02%), Chillies (2.57%) and Karvanda (1.60%) (Table 2b). With regards to packing, a 200g standee pouch was the preferred packaging used by the retailers.

Table 2b. Share of different types in the retail pickle market (%), Pune

SI	Types	Share (%)
1	Mango	63.02
2	Lime	2.95
3	Chillies	2.57
4	Amla	13.02
5	Karvanda	1.60
6	Mixed	15.86
	<b>Total</b>	<b>100.00 (96.95 kg/m)</b>

Retailers' margin: Retailers' margin varied across the type of retailers as well as the products sold. The margin ranged from 5per cent to 15 per cent in the case of cooperative retail outlets such as the Sankalpa, Vrindavan and Savitri outlets. The margin of private retailers was 15-20 per cent for Pravin brand products (pickles), 25 percent for Maharaja Brand products (amla and tamarind) and 20% for Kamadhenu brand pickles. The margin was up to 30 per cent in the case of some retailers irrespective of the brand or products sold. Pickles are sold in 200 g, 250 g and 350 g plastic packets. Larger quantities of 500g and 1kg were sold in plastic containers by retailers.

#### *Squash market*

Amla, pineapple and orange squash are sold in the market. Sankalpa and Maharaja were the popular brands of amla squash sold by the retailers. Amla squash is sold in 500 ml and 650 ml bottles and pineapple and orange squash are sold in 700 ml bottles.

#### *Other underutilised fruit products markets*

Other underutilised fruit products like amla candy, amla murabba, supari, mouth freshener and tamarind products e.g. tamarind concentrate, tamarind panipuri masala

are being produced by women SHG of Sankalpa and Maharaja (Narmada Food Products) and the Sankalpa products are sold only through Sankalpa, Vrindavan and Savitri outlets. Some retailers are selling very small quantity of tamarind products.

Consumers' attitude about the products: Consumers buying from retailers held the view that packaging and sealing should be improved. The standee pouch was observed to be good for pickles and amla candy while a plastic bottle was preferred for murabba and squash.

Conditions for sale of new brand/product: For new products like amla pickle, murabba, squash and tamarind products like concentrate, private retailers offered to sell these products under the following conditions:

- Samples to be given first;
- Payment after the sale of the products;
- Quality should be good and the price should be reasonable, Size of packet should be small (200 - 250 g);
- A margin of 25% - 35% should be given on each new product;
- Weekly supply is better and a minimum of 10 kg/week should be supplied.

### *Consumers' survey*

A consumer survey was undertaken in Urali Kanchan and Pune market. The results of the survey are presented below:

Amla pickle: The product is sold in 200 g and 1 kg packets which were liked by the consumers. The quality observed to range from good to excellent. Nearness to the house, preference for small sized packets and shop having all the consumable items are some of the attributes for marketing amla pickle through the Sankalpa Out let in Uralikanchan.

Amla Supari: The consumption of supari was popular on journeys and in summer. Small packets of 50-100 g were preferred by consumers. Availability of the product close to home, good quality, good taste and crispness were important attributes for marketing amla supari. It is interesting to note that consumers were willing to pay 5 per cent more for amla supari which speaks of the good demand for it.

Amla murabba (jam): Consumers attributed the medicinal property of amla and excellent quality in terms of taste, colour and thickness as reasons for preferring amla murabba. However, non-awareness, non-availability of amla supari in nearby shops may pose problems in marketing it. Amla murabba sold in 250 g bottles appeared to be accepted by the consumers.

Amla candy: Excellent quality in terms of taste and small packets of 100g, 5 piece packets, and nearness to home were the attributes for successful marketing of amla candy.

Amla squash: Good quality in terms of sweetness, thickness, bright colour, right price and packaging in 500 ml bottles enhanced consumption of amla squash. However, the colour of the label was observed to be too dull, while the license No. needed to be put on the label.



## DHRUVA- BAIF, Kaprada, Gujarat

### *Market survey in Dharampur and Valsad markets*

Three wholesalers and six retailers were contacted in the Dharampur market. In Valsad district market, four wholesalers and seven retailers were contacted and the required information was collected. It is interesting to know that underutilised fruit products like Pachan amla (Amla Supari) – Shankar and Oswal brands, Swadist Imli (Tamarind Candy) - Sonali and Sagar brands, Bore Koot (Ber Powder) - Rukso and Oswal brands are also sold by retailers and wholesalers of Dharampur along with pickles, jams, syrup etc. indicating thereby a potential market for underutilised crop products of the Community Processing Facility at Panas. These products can be used for comparisons with the output of the facility. The market survey in Valsad district market showed that Salted Ber, Bore Koot (Ber Powder), Imli Candy (Tamarind Candy) mixed pickles, jams and juices were the products marketed by wholesalers and retailers in the market.

### *Dharampur and Kaparada Taluka market*

The wholesale market: The underutilised fruit products market: Amla products like whole amla in brine, Pachan amla, amla supari and tamarind products like Imli sauce, Swadist Imli (Imli candy), and Bore koot (ber powder) were sold by wholesalers. Underutilised fruit products accounted for 5.94 per cent of the wholesaler's trade in Dharampur market (Table 3a).

Table 3a. Share of different types in the wholesale market, Dharampur (%)

SI NO	Types	Share (%)
1	Pickles	94.06
2	Underutilised fruit products	5.94
	<b>Total</b>	<b>100.00 (179.32kg)</b>

Popular brands of underutilised fruit products: Oswal, Shankar and Rukso brands of pachan amla, Ahar brand of imli sauce, Tarun and Kelkar brands of bore koot (ber powder) were the popular brands of wholesalers.

Wholesaler's margin: Wholesaler's margin ranged from 9 per cent for the Rasraj brand to 18 per cent – 20 per cent for Vrindavan pickles, and 20 per cent for other brands.

### *The retail market*

A total of six retailers dealing in pickles, squash, murabba, candy and concentrates were interviewed in Dharampur town with the help of a questionnaire. Bakeries and provision stores were the retailers of these items in the survey area.

Underutilised fruit products market: Katti mitti imli (Tamarind candy), karvanda/kerda pickle, pachan amla (amla supari), bore koot (ber powder) are the major underutilised fruit products sold by the retailers. The underutilised fruit products accounted for 20.51 per cent of the retailers' trade in Dharampur market (Table 3b).

Table 3b. Share of different types in the retail market, Dharampur (%)

SI No	Types	Share (%)
1	Pickles	79.49
2	Underutilised fruit products	20.51
		100(119.23kg)

Popular brands of underutilised fruit products market: Frootlet (Trimoorthy foods), Rasraj kerda pickle, Shankar pachan amla, Kelkar bore koot are the major brands traded by the retailers.

**Retailers' margin:** Retailers' margin varied across the type of retailers as well as the products sold. The margin ranged from 5% - 6% for cashew kernels, 15% to 25% for amla products, 20%-30% for pickles in case of cooperative Vrindavan retail outlets. The margin of the private retailers was 15-20% for Vrindavan brand pickles, 15% for Rasraj pickles, 10%-15% for Nilon's pickles. For underutilised products like pachan amla, ber powder and imli sauce the margin was up to 20 per cent.

**Consumers' attitude to the products:** Consumers buying from the retailers believed that the standee pouch was good for pickles and a plastic bottle was preferred for amla chunda and syrup.

**Conditions for sale of new brand/product:** For new products like amla pickle, murabba, squash and tamarind products like concentrate, private wholesalers and retailers offered to sell these products with the following conditions:

- Samples to be given first;
- Small sized packs preferred;
- Payment after sale of the products;
- Quality should be good and the price should be reasonable, Size of packet should be small (200 - 250 g);
- A margin of 20% - 25% should be given on each new product;
- Weekly supply is better and a minimum of 10 kg/week should be supplied.

### **Valsad district market**

#### *Retailers*

Seven retailers dealing in pickles, jams, amla, ber and tamarind products in the retail market of Valsad city were interviewed for the market survey.

Underutilised fruit products market: Amla morabba (Darthi brand), karvanda pickle, Swadist Imli (Sagar brand), salted ber (HR), ber powder (Kaka), pachan amla (Oswal brand) are the underutilised fruit products traded by retailers. Underutilised fruit products accounted for 11.38 per cent of the retail trade in the Valsad district market (Table 4).

Table 4. Share of different types in the retail market, Valsad (%)

<b>SI No</b>	<b>Types</b>	<b>Share (%)</b>
1	Pickles	88.72
2	Underutilised fruit products	11.38
	Total	100 (42.89kg)

**Retailers' margin:** In the pickle market, the margin ranged from 20-21 percent, for Mother's, 18-28 per cent for Vrindavan, 20-22 per cent for Pasand, Pravin, 18-20 per cent for Rasraj and 25-30 per cent for Nilon's. In the jam market, the margin was 9-10 percent for Kissan, 10-15 per cent for Noble. For pachan amla, salted ber and imli candy, the margin was in the range of 25-30 per cent.

#### *Conditions for sale of new underutilised fruit products*

- Samples to be given;
- Sale after consumers' favourable response;
- Credit sale;
- Quality should be good;
- Minimum 20% - 25% margin;

- A small sized packet (100 g) is preferred.

### *Consumer survey*

Amla supari: DHRUVA sold amla supari in 10-15 g sachets which consumers preferred. Colour and taste were found to be good. However, the 10-15 g sachet needed to be in 100g polythene pouch. There was a need for improved labeling. Consumers believed that the label should list the contents, ingredients, best before date, manufacturing date and medicinal value of the product along with the price.

### *Economics of small scale processing and marketing of underutilised fruits at the community village level*

After undergoing training on small scale processing of underutilised fruits at IIHR, Bangalore jointly organised by ICUC, IIHR and BAIF, officials of BAIF have, in turn, trained women SHG members in the area and have been able to establish community village level fruit processing units in several villages. Processing units had produced amla products in addition to those tamarind and jack fruit. Economic feasibility of small scale processing of amla products was assessed and the results are presented in Table 5.

Economics of small scale processing of Amla into Raw Pickle: It may be observed from the table that the processor has to invest Rs.35.11 to produce a kg of raw pickle. The net profit was Rs.7.89/kg with a price of Rs.43/kg and the profit margin of the processor was 22.5 per cent.

Economics of small scale processing of Amla into Pickle (Hot): On average about 25 kg of amla was processed into pickle every day. As may be seen from the table, the cost of processing of amla worked out as Rs.50.04/kg of pickle produced. With a price of Rs.60/kg, the processors could realise a net profit of Rs.9.96/kg by preparing amla pickle. The processor's margin was observed to be 19.92 per cent.

Economics of small scale processing of Amla into squash: On an average, 25 kg of amla was processed into squash per day. From the data collected from processors, economics of squash preparation was worked out and the results of the analysis are presented in Table 5. It may be noted from the table that the cost of producing one bottle (500 ml) of squash worked out to Rs.15.01 and with a price of Rs.40/bottle, a bottle of squash could realise a profit of Rs.24.99.

Table 5. Economics of small scale processing of amla into different products at Community Village level

Particulars	Underutilised fruit products		
	Amla pickle(Raw)	Amla pickle (Hot)	Amla squash
Total quantity Prepared (kg/bottles)	208.00	500.00	5000.00
Gross returns(300kg @ Rs. 40/kg)	8944.00	36000.00	200000.00
Cost of processing (Rs)	7303.60	30024.00	75064.18
Net return (Rs)	1640.40	5975.82	124935.82
Cost of Production (Rs/kg/Rs/bottle)	35.11	50.04	15.01
Price realised (Rs/kg)/(Rs/bottle)	43.00	60.00	40.00
Net profit (RS)	7.89	9.96	24.99

## **CONCLUSIONS AND RECOMMENDATIONS**

### **BIRD-K, Tiptur, Karnataka**

Processing of amla was found to be profitable. However, at present products are marketed through BAIF and other channels ought to be explored.

The market survey indicated that a market does not exist for underutilised fruit products in the local Tiptur market. However, in the Hassan district market, underutilised fruit products like citron pickles, amla pickle, tamarind paste and jack fruit chips are sold by retailers in small quantities. In both the markets, wholesaling of underutilised fruit products was not found feasible but some retailers expressed their willingness to sell under conditions such as samples to be given, payment promptly after sales, a margin of 20-25 per cent and small sized packets. Accordingly, conditions have to be fulfilled for developing a market for the products of small scale processing units.

Consumer surveys have indicated that underutilised fruit products are acceptable. However, the 'Gramasiri' brand label is not attractive and hence needs to be redesigned and the label should contain details on manufacturing date, 'consume by' date, ingredients, license No. and price.

### **CRS, Pune, Maharashtra**

At present, underutilised fruit products produced by community village level small scale processing unit are sold through Sankalpa cooperative society under the brand name of 'SANKALPA'. However, once the capacity of the processing unit is expanded and greater quantities of the products are produced, Sankalpa may not be able to market the entire production. Hence, alternate market channels have to be explored.

The market survey of underutilised fruit products in Pune indicated that underutilised fruit products like amla pickle, amla squash, amla supari and tamarind products like concentrate, pani puri masala are already offered in the Pune market though their share is very small. Maharaja (Narmada Food Products) appears to be the major competitor for the products of the community level processing unit.

Retailers are willing to market products of the unit with the following conditions:

- Samples to be given and after consumer response, the products should be salable;
- Good quality and reasonable price;
- Small sized packets of 200-250 g with a margin of 25-35 per cent.

The above conditions should be met for marketing of products through the retailers like bakeries and tea depots.

By and large, the consumers accepted the quality and price of underutilised fruit products produced by the small scale processing units. However, the label was observed to be dull and needs improvement to be made attractive.

### **DHRUVA-BAIF, Kaparada, Gujarat**

The underutilised fruit products of the community processing unit are sold through the well established brand of 'VRINDAVAN' of Vasundhara Cooperative Society located in Lachhakadi, Vansda which has been in existence for the past 15 years.

The market survey in Dharmapur taluk and Valsad district indicated that underutilised fruit products like pachan amla (digestive amla), ber powder, salted ber and tamarind candy are already in the market under different brand names like Oswal,

Khelkar, and Frootlet etc. These account for 6-10 per cent of the wholesale trade and 11-20 per cent of the retail trade in Dharampur and Valsad markets respectively indicating thereby the existence of the market for underutilised fruit products from amla. Hence, Vrindavan branded products have to compete with Oswal and Shankar brands of pachan amla, Ahar and Frootlet brands of tamarind sauce and candy, Tarun and Khelkar brands of ber powder. The share of the underutilised fruit products is small but these products have made their presence felt in the market. If Vrindavan branded products are to be sold through the retailers, the following conditions need to be fulfilled:

- Samples to given to assess the consumer response;
- Small sized packets are preferred;
- Credit sale to be allowed;
- Good quality and reasonable price with a margin of 20-25 per cent.

The quality of the products should meet the Food Products Order (FPO) licensed quality specifications. DHRUVA-BAIF should ensure this. The consumer survey indicated that amla supari prepared by the community processing unit appeared to be good but depending upon the requirement the packaging needed to be improved, the label should be attractive and it should list ingredients, best before date, medicinal value of the product and the price. Small sized packing especially in small sachets of 10-15g packed in 100-200 g polythene pouches is preferred by the consumers.

### **Acknowledgements**

The authors wish to thank Dr Nazmul Haq, Former Director, ICUC, UK; The Director, IIHR, Bangalore; Dr J.N. Daniel, Chief Scientist, BAIF; Mrs.Jayalakshmi, Ms.Poornima, Ramesh, BIRD-K, Tiptur, Karnataka; Dr P.K. Kulakarni, Ms.Surekha Labade, Sri.Shivatara, CRS, BAIF,Uralikanchan, Maharashtra; Sri.Rakesh Tandel, Sunil Savade, Keyur, Manoj, BAIF-DHURVA, Kaparada, Gujarat for their help and cooperation during the project period.