

# Value Addition of Some Minor Fruits of NE India-A Strategy for doubling farmer's income. (A review)

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**Abstract-** The north Eastern Region of India is rich in diversity of indigenous minor fruits. Minor fruits are known to play vital role in food and nutritional supplement of rural community from time immemorial. Many of the minor fruits are found in Assam which grows wild and found also in homestead garden. Minor fruits are hardy and can be grown in adverse condition and are also known for therapeutic, medicinal and nutritive value and can fulfill the demands of health conscious present generation. Many of minor fruits remained unexploited due to lack of awareness of market demand and knowledge of value addition. There are immense potentialities of preparation of high nutritive value products from these crops through processing and value addition such as jam, jelly, squashes, dried fruits, pulp etc.. Among the different indigenous minor fruits viz., Kordoi (*Averrhoa carambola* Linn.) Amlakhi (*Phyllanthus emblica* Linn.) and Bael (*Aegle marmelos* Correa) have high potential for value addition. Thus, value addition in minor fruits could be one of the appropriate options to enhance farmer's income.

**Index Terms-** Minor, Indigenous, Fruit, Income

## I. INTRODUCTION

The north eastern region of India is rich in diversity of minor fruits. Minor fruits play a vital role in rural areas by providing nutritional supplement and generating additional income to the poor people. Indigenous fruits are rich source of mineral, vitamins, fibers which provides health benefits to rural people. Minor fruits also have cultural importance (Arora, 1998). Minor fruits are not extensively cultivated and their consumption and trade is limited. These fruits to some extent help in fulfilling the demand of natural, nutritious, delicately flavored food of high medicinal value. In present day situation consumers are becoming more conscious about the health and nutritional aspect of the food and have tendency to avoid chemical and synthetic foods. The minor fruits like aonla, bael, carambola etc. provide livelihood to the poor people and play vital role in defeating malnutrition (Gajanana *et al*, 2010).

In NE India, minor fruits have a very big role in overall fruit production. There are various number of edible species of minor fruits are available in NE India. These fruits are mainly wild in nature though some fruits are recommended for commercial cultivation. The land holding pattern of NE India in general reveals that nearly 90% of the farmers are small and marginal;

hence, the minor crops are ideal for cultivation because of their low input requirement, less production cost, higher nutritive value and high yield

Fruit processing for value addition helps to ensure better economic condition of the growers. It can help to generate self employment for small and poor farmers and could be easiest and promising alternatives. Generally fruits are perishable in nature and there is huge post harvest losses occurred in their season time in case of minor fruits. Processing of these fruits is the main pathway through which these losses can be minimized. There is great scope for processing and value addition to the minor fruits into various products like jam, jelly, preserve, candy, confectionery, pickle, fruit drinks, dried products etc.

## II. {PROSPECT OF PROCESSING FOR VALUE ADDITION:

Minor fruits are rich in vitamins, minerals and dietary fibre and therefore, are essential ingredients of healthy diet. These fruits also have very good medicinal properties. NE India has a very long list of minor fruits having high potentiality of processing to high nutritive value products. Growers can get fair returns through value addition and it helps them to improve their economic condition and can solve the problem of unemployment during off season of agricultural sector. So, there is huge prospect of processing of minor fruits of the region to value added product like jam, jelly, squash, pickle, candy etc. Processing methods developed by some author for a few minor fruits of NE India are explained below.

### 2.1. Kordoi (*Averrhoa carambola* Linn.):

The fruit of **Kordoi** (*Averrhoa carambola* Linn.) is a rich source of reducing sugars, ascorbic acid, oxalic acids and minerals such as K, Ca, Mg and P. The star sections of the fruits are used in salads and on cakes. They are also used for preparing juice, preserves, jam, jelly and pickles. The juice of carambola fruit has good medicinal property against jaundice disease (Singh *et al*.2006). Carambola fruits are packed with many nutrients which are essential for the daily upkeep of the body, nevertheless, they are only available when they are in season and because of ripening can get spoiled quickly (Joy & Abraham, 2013).

#### 2.1.1 Kordoi Product:

**Kordoi** (*Averrhoa carambola* Linn.) fruits are highly perishable items which need processing to make it durable. The

shelf life of kordoi is one week depending on temperature and humidity. Once ripe it should be eaten within two or three days (Bastin, 2004).

Kordoi fruits are processed into numbers of food products like Jam, jelly, nectar, Squash etc. (shinde VP 2016, Darkwar I *et.al.* 2016). Process flow chart of various carambola products are given in Fig: 1 & Fig: 2

## 2.2 Amlakhi (*Phyllanthus emblica* Linn.) :

Amlakhi or aonla fruit is highly nutritive with a great medicinal use and the richest source of [vitamin C](#). Chauhan *et.al.* stated that 100 gm pulp of amlakhi contains 500-1500 mg of [ascorbic acid](#). This is much more than the [vitamin C](#) content of guava, citrus and tomato fruits. The fruit juice contains nearly 20 times as much [vitamin C](#) as in orange juice (Shankar 1969). Its other constituents are phenols and tannins containing gallic acid, elegiac acid and glucose which prevent oxidation of [vitamin C](#). Fresh aonla juice is used for the treatment of several ailments like tuberculosis of lungs, asthma, bronchitis, scurvy, diabetes, anemia, weakness of memory, cancer, tension, influenza, cold, loss and grayness of hair etc. The consumers do not prefer this fruit in fresh form due to high acidic and astringent nature. Various ayurvedic products like Chayvanprash, Triphala, etc. are prepared from amlakhi.

### 2.2.1 Amlakhi Product:

The post harvest losses in aonla vary from 30% to 40% due to its perishable nature, which reduces the market value (V T Kore *et.al.* 2013). Value addition through processing would be the only effective tool for economic utilization of increased production of aonla in the future. Processing not only reduces the post harvest losses but also provides higher return to the growers. A number of products such as preserve, jam, jelly, candy, pickle RTS beverage, dried powder etc (Tandon *et.al.* 2003, Bhattacharyya *et.al.* 2011). Process flow chart of aonla products are given in Fig:3 and Fig: 4

## 2.3 Bael (*Aegle marmelos* Correa):

Bael fruit is an indigenous fruit of India belonging to the Rutaceae family. This is generally considered as a sacred tree by the Hindus. Bael fruit is truly popular to combat constipation. Its medicinal properties have been described in the ancient medical treatises in Sanskrit. The unripe bael fruit are used for pharmaceutical use (Hema and Lalitha Kumara, 1999, Patnayak and Mahapatra, 2008). The ripe fruit is good for treatment of dyspepsia (Parichha, 2004, Chowdhury *et.al.* 2008).

### 2.3.1 Bael fruit products:

Bael fruit can be processed to value added product like squash, fruit pulp, RTS juice, Fruit powder, Jam, Toffee etc. (Singh A.K. and Chaurasia A.K. 2014). Process flow chart of bael product given in Fig: 5 & Fig:6



*Fig1: Flow chart of carambola jam production.  
Source:Darkwar et. Al. 2016*

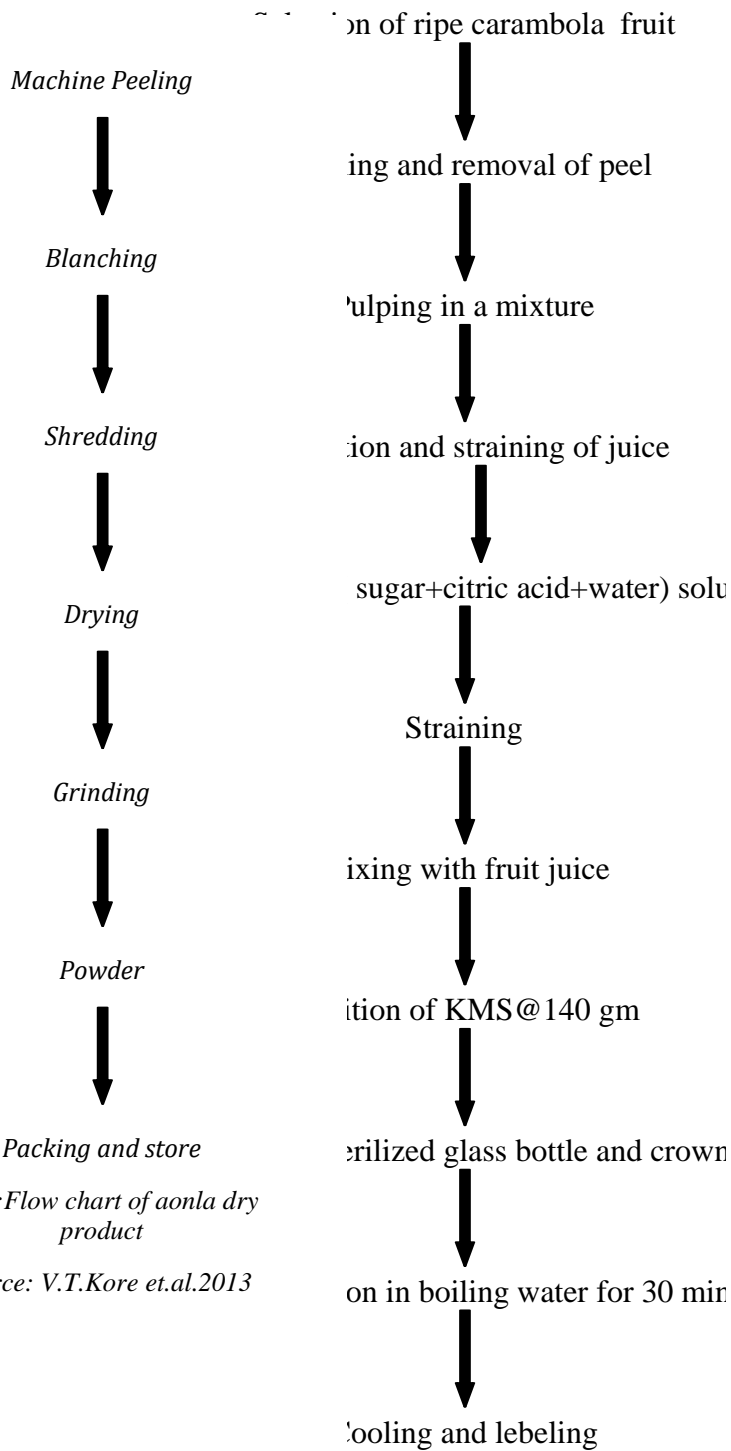


Fig3:Flow chart of aonla dry product

Source: V.T.Kore et.al.2013

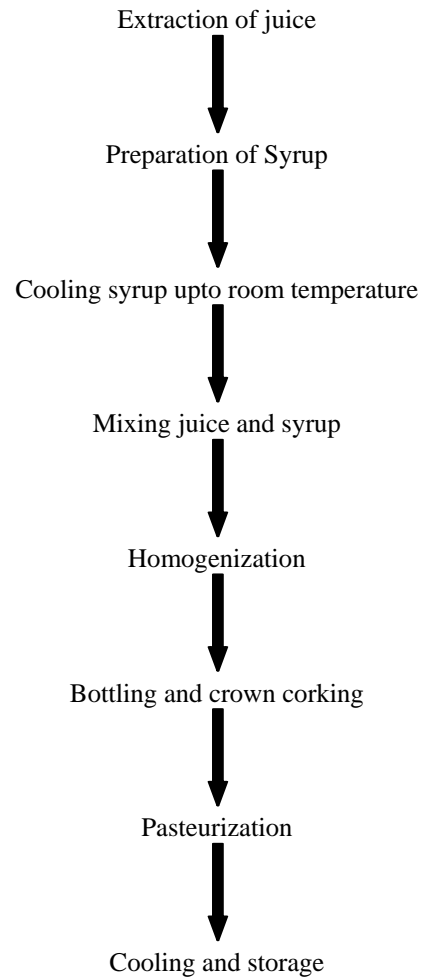


Fig4: Flow chart of RTS aonla Juice

Source: V.T.Kore et.al.2013

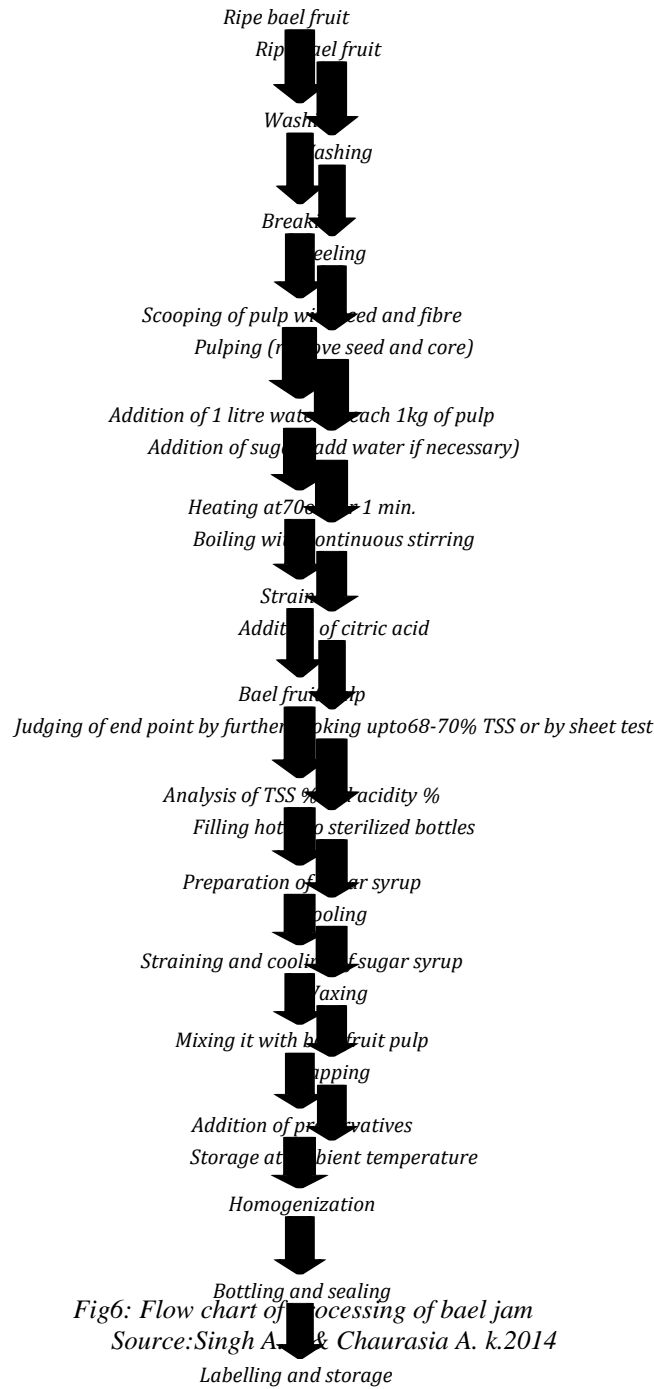


Fig5: Flow chart of processing of bael squash  
Source: Singh A.K. & Chaurasia A. K. 2014

### III. CONCLUSION

Minor fruits has vital role in the nutrition of people in rural and tribal communities. Minor fruits are excellent source of vitamins, carbohydrate, protein, fibers and minerals and enriched with medicinal value. Minor fruits can be cultivated in wastelands with very less care. Therefore, it is important to recommend for commercial cultivation of minor fruits like aonla, carambolla, bael, etc. to maximize their utilization. Now a day, the demand from new generation for nutritious, delicious and attractive food product is at peak. The potentialities of value added products through processing from some minor fruits are not exploited in the NE India. Excessive production of fruits produced during a season result in glut in the markets and leads to huge post harvest losses. However, various efforts have been made by some researcher in the globe for the development of processing technology for value addition of minor fruits. It will reduces the post harvest losses during the season and farming community will be able to get more income as it minimizes the wastage and due to higher price of value added products in present scenario.

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