

## Value-Added Processing of Underutilized Fruits: Treasure for India's Future

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**ARTICLE ID: 101**

### Introduction

Fruit crops play a significant role in addressing nutritional needs while also adding value and earning foreign earnings. Species that have traditionally been used for food, fibre, fodder, oil, or medicinal purposes are among the underutilized fruit crops. Those species, on the other hand, have untapped potential to provide food security, nutrition, health, income, and environmental services. Fruits such as jackfruit, bael, jamun, karonda, phalsa, custard apple, wood apple, lasora, and others that are underutilized are major sources of livelihood for the poor and help to combat malnutrition (Gajanana *et al.*, 2010). Fruit crops that are underutilized are mostly high in antioxidants and nutrients. Due to the significant level of astringency and acidic character of the fruits, these crops are not widely known. Diversification and popularization of such underutilized fruit crops are urgently needed. This can be accomplished by establishing appropriate processing and marketing methods for these minor fruits, such as transforming them into a variety of products.

### Processing

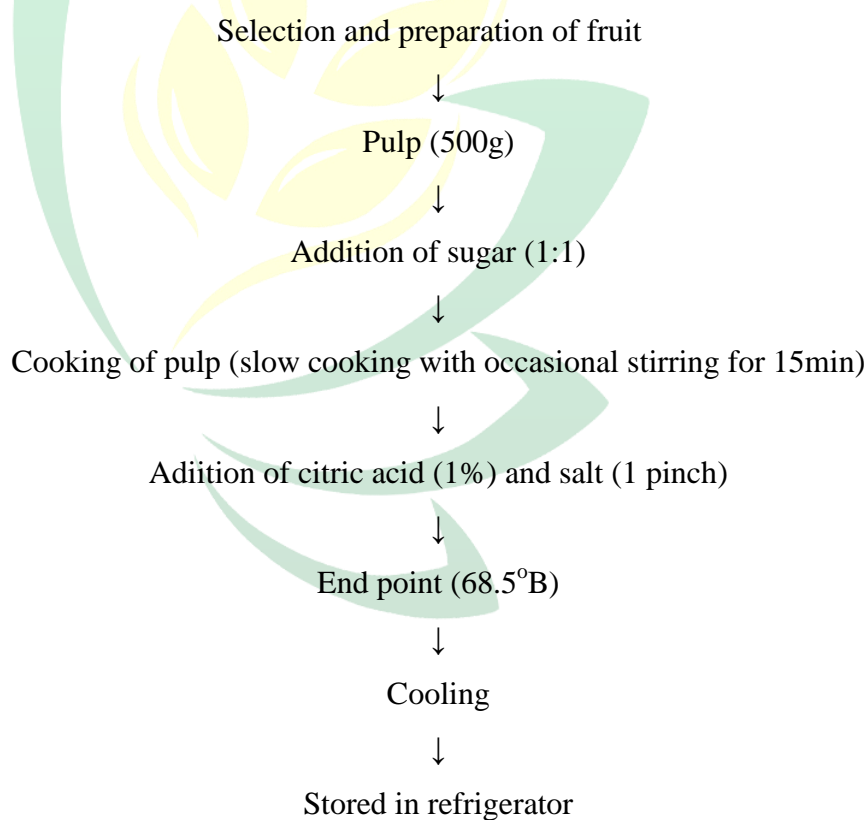
Aside from developing a business with a good return on investment for the owners, there are many reasons for processing fruits, including preventing post-harvest losses, eliminating waste, preserving quality, preserving the nutritive value of the raw materials, making seasonal horticultural produce available throughout the year, putting them in convenient form for the user, safely storing food for emergencies, and developing new products. As a result, it will benefit producers, processors, and consumers in the long run. The processing of these minor fruit crops primarily contributes to improved nutritional security and waste utilization. Processes for jackfruit (squash), karonda (jam), lasora (pickle),

and other fruits are now available. Other minor fruits, such as wood apple, phalsa, and ker, have a lot of potential in the processing sector.

### Value addition

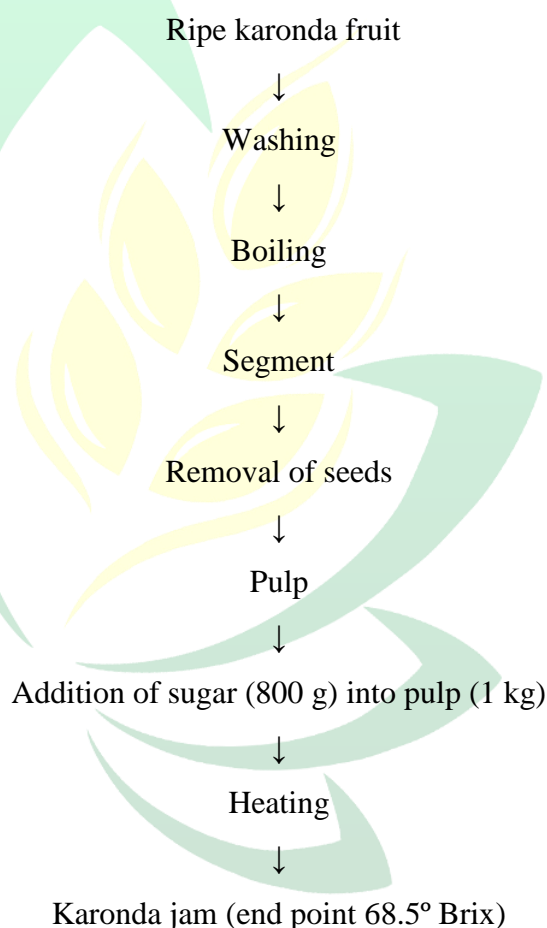
Value addition is the process of achieving a high price for the same volume of a primary commodity through processing, packing, quality improvement, or other methods. Underutilized fruits have a lot of potential for processing and value addition into products like jam, jelly, preserves, candies, confectionary, pickles, fruit drinks, and so on. Some value added products from different minor underutilized has been discussed below:

- 1. Woodapple** - Wood apple is used to make chutneys, jams, and jellies. The therapeutic value of the wood apple is very high. Every portion of the fruit, including the pulp, seed, and oil, has therapeutic properties. The fruit is widely used in India as a liver and cardiac tonic, and when unripe, as a means of preventing diarrhoea and dysentery, as well as an efficient therapy for hiccough, sore throat, and gum disease (Mondal *et al.*, 2002).



Flow chart for preparation of woodapple jam

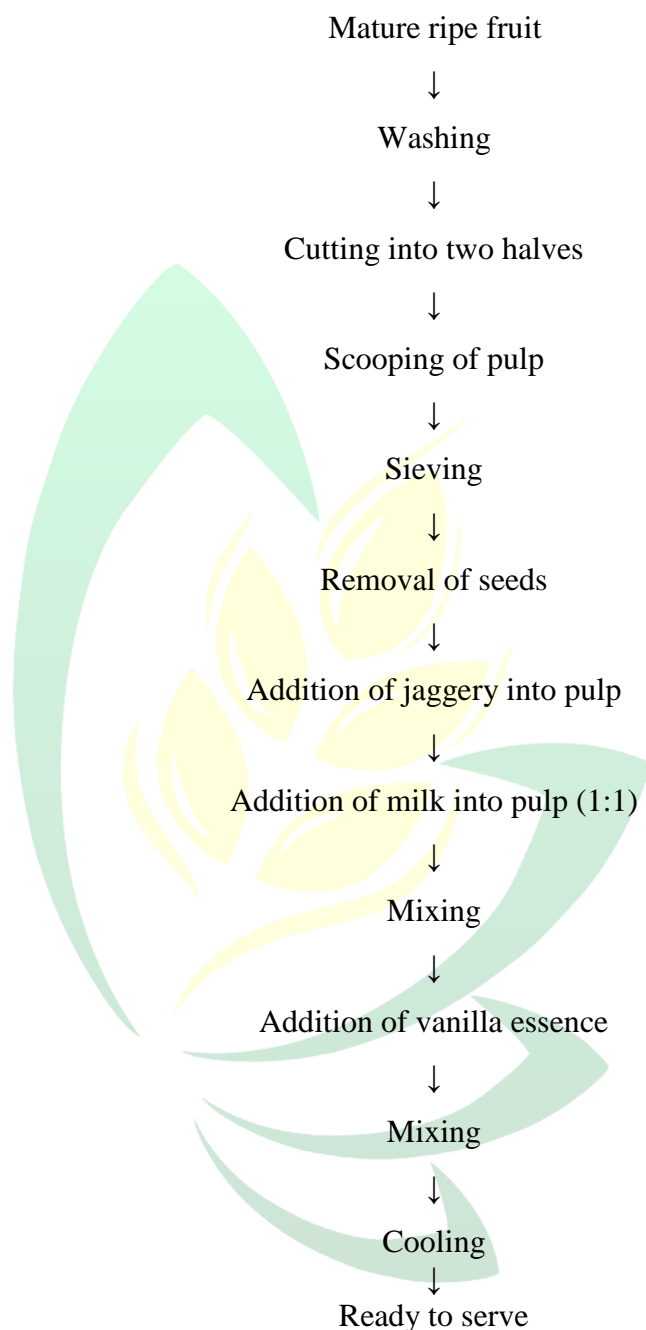
2. **Karonda** - It is one of the richest source of iron and contains a significant quantity of vitamin C, making it ideal for treating anaemia and possessing anti-ascorbic qualities. Fruits are employed as an astringent, anti-ascorbic, and biliousness treatment (Jadhav *et al.*, 2004). It is commonly utilized for medicinal purposes by tribals across India, and it is quite popular in ayurveda, unani, and homoeopathy, among other indigenous medical systems. The pectin content of ripe karonda fruits is substantial. As a result, it is used to make jelly, jam, squash, syrup, tarts, and chutney, all of which are in high demand on the international market (Wani *et al.*, 2013).



**Flow chart for preparation of Karonda jam**

3. **Custard Apple** - The fruits are primarily consumed by the lower and middle classes in India. Custard apple is perishable and cannot be kept for long periods of time. Sugar content is high in ripe fruits. Calcium, phosphorus, and iron are all abundant in

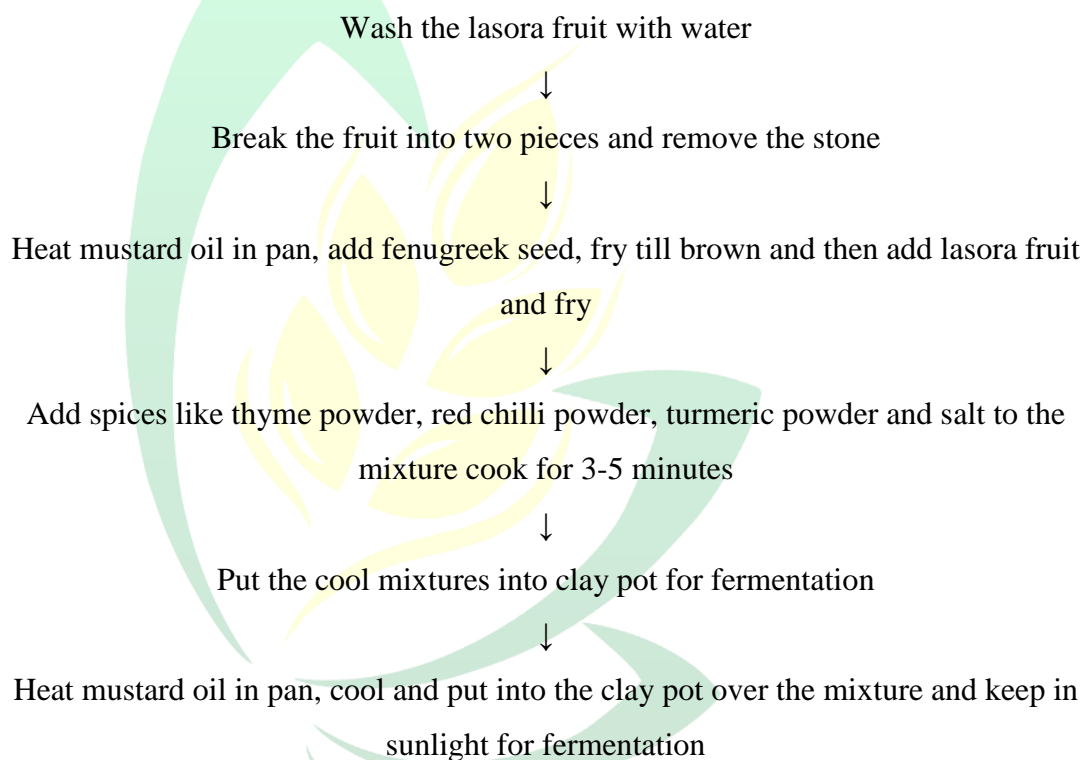
ripe fruit. Custard apple can be used in preparation of smoothies, milk shakes, and even into natural ice creams (Vishnupriya and Dhandapani, 2015).



**Flow chart for preparation of Custard apple milk shake**

- Jamun** - Since it became commercially available some decades ago, the plant has been regarded as an anti-diabetic plant. The seeds have also been proven to have anti-inflammatory and antioxidant activities. Health drinks, preserves, sherbet, syrup, squashes, jellies, and wine are all made with ripe fruits of jamun.

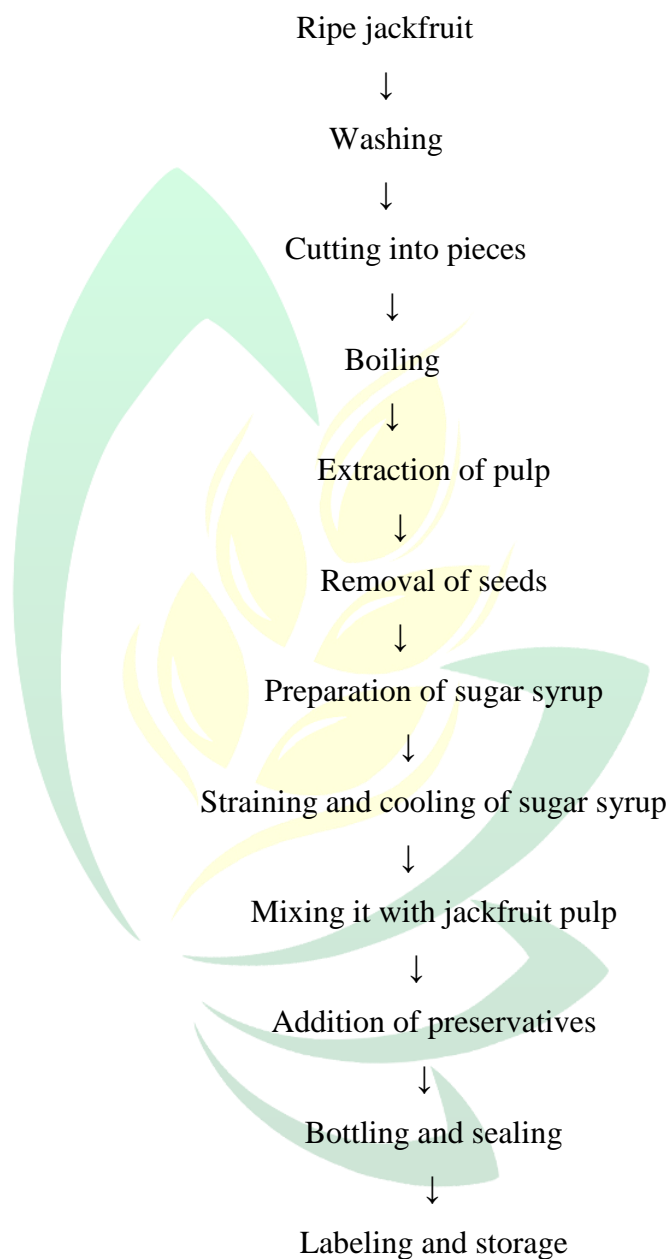
5. **Lasora** - The tree provides small fruits in bunches that are utilized in traditional vegetable and pickle preparations. It has traditionally been associated with health, nourishment, and other diverse uses in curing specific human disorders due to its versatile nature. Fruits are one of the richest natural sources of antioxidants, such as carotenoids, ascorbic acid, and phenols, among others. Fruits are rich in minerals, fibre, and vitamins, all of which are critical components for human health (Mala, 2009). Green fruits that are still immature are utilized as vegetables and pickles. Fruits are sometimes desiccated after blanching to be eaten as a vegetable during the off-season (Singh, 2001).



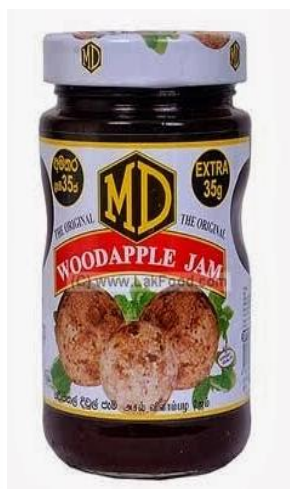
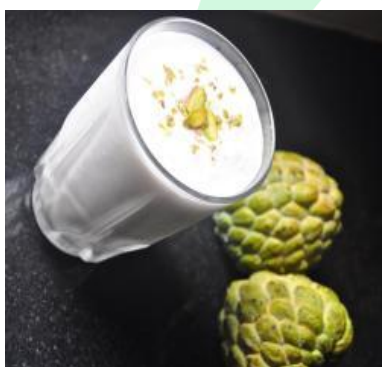
#### Flow chart for preparation of lasora pickle

6. **Jackfruit** - The jackfruit (Kathal) is an important fruit of the Indian cuisine, and it has medicinal characteristics according to Ayurveda. People ate it largely as a fruit when it was ripe, but sometimes as a vegetable when it was unripe. As a source of vitamins, minerals, and calories, the jack fruit makes a substantial contribution to the nutrition of the inhabitants of this country. Minerals and vitamins abound in both unripe and ripe fruits, as well as the seeds. Antibacterial, anti-inflammatory, anti-diabetic, antioxidant, and immune modulatory activities have been documented for

the plant. Macronutrients such as vitamins, minerals, and organic acids are also present in the ripe fruit (Tiwari and Vidhyarthi, 2012). The fruit is also used to make jam, jelly, squash, and chutney. In several north Indian states, unripe green fruit is used as a vegetable called as 'Kathal sabzi.'



**Flow chart for preparation of jackfruit squash**

**Lasora pickle****Jackfruit squash****Woodapple jam****Custard apple milk shake****Jamun Sherbet****Karonda jam**

## Conclusion

Minor fruits are the future of horticulture in the twenty-first century, since they can provide a multitude of benefits in terms of profitability, productivity, sustainability, crop quality, food safety, environmental protection, and rural economic development. A considerable section of the rural population relies on locally available fruits to supplement their nutrition. These fruit crops have a long history of use, and the locals are well aware of their nutritional and therapeutic benefits. Minor fruits can be produced without much care even in wastelands. As a result, it is worthwhile to investigate the systematic cultivation and enhancement of minor fruit crops such as jamun, wood apple, and lasora, among others, in order to maximize their consumption. The potential of processed products made from some of the country's minor underutilized fruits has yet to be realized. Various researchers, on the other hand, have worked to generate value-added products from underutilized fruits. It represents the viability of developing some varied value added goods from some of India's

minor fruit harvests in order to reduce wastage, promote these products as export items, and improve the nutritional and socio-economic condition of the country's most vulnerable communities.

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