

**STUDY ON MANUFACTURE OF SPRAY DRIED WOOD
APPLE (*Feronia limonia*) AND BAEL (*Aegal marmelose*)
FRUIT PULPS AND THEIR POSSIBLE
USES IN THE INDUSTRY**

BY

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DECLARATION

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**A DEDICATION TO
RESPECT
MY
EVER LOVING
MOTHER & FATHER**

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LIST OF ABBREVIATIONS

1. AA - Ascorbic Acid
2. MPA - Meta Phosphoric Acid
3. 2,6-DCP - 2,6- Dichlorophenol indophenol
4. Sec. - Seconds
5. Mins. - Minutes
6. Fig. - Figure
7. App. - Appendix

1.1 Introduction

The main objective of fruit processing is to supply wholesome, safe, nutritious and acceptable food to consumers and to minimize the post harvest losses. Development of processing, storage, transportation and marketing programs are very important to make efficient use of fruits and other farm products. Fruit processing projects also aim to replace imported products like squash, cordials, jams, syrups, beverages, pickles, etc.

Wood apple and bael are seasonal hard fruits belong to family *Rutaceae*. Both are native and common in the wild in dry plains of India and Sri Lanka. The therapeutic properties of wood apple and bael have been well documented¹⁴. These fruits are rich in vitamins and minerals, and can contribute significantly to the daily nutrient needs of the individual³¹. Both trees are cultivated on a limited scale in Sri Lanka in domestic orchards. There is a considerable post harvest loss in both commodities in the chain of harvest to the final consumer. Nevertheless, processed products in the form of jam, squash and ready to serve beverages are available. However there is a need to diversify the product range to minimize post harvest losses.

Fruit juices have their best taste, aroma and colour when they are freshly extracted or expressed. All subsequent efforts to preserve them adversely affect their quality to varying degrees, depending upon the method of preservation employed⁷. In the current investigations an attempt has made to process wood apple and bael fruit to a fine reconstitutable powder. The processing conditions in spray drying technology are known to retain physical and chemical properties of processing material to a high degree.

Spray drying technology originally developed to dehydrate milk and milk based products is currently being applied to process a broad spectrum of products beside dairy. Spray drying is a method for drying food liquids and some slurry in which the feed is mixed with heated air in a drying chamber. Rapid drying takes place and a dry powder is formed. Spray drying can be accomplished with little loss in nutrients. Milk powders retain Vitamin A, Niacin, riboflavin and other vitamins well⁹. Processing of products made from natural ingredients it is desirable to retain the natural properties and qualities in the final powder form. This is possible for some products, while others involve a recipe containing additional carriers, antioxidants, pH-stabilizers and so forth.

There have been successful applications of spray drying technology to dehydrate fruit juices by spray drying in India, China and the products are available to consumers. Though the products are available, published data in respect to processing technologies are not available. Potential exists in Sri Lanka to evaluate possibilities of the application of spray drying technology to manufacture reconstitutable fruit juice powders in Sri Lanka.

1.2 Objectives of the study

1. Manufacture of spray dried powder from wood apple and bael with specific physical, chemical and functional properties.
2. Establishment of product identity reflecting the major chemical constituents and assessment of reconstitutability and organoleptic properties.
3. Studies on moisture sorption properties to predict the packaging needs.

CHAPTER -2

LITERATURE REVIEW