

**Application of Modern processing Technologies in the  
Manufacture of Ayurvedic Medicine.  
Honey & Garlic Mix (*Madhu Lasuna*)**

**BY**

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## DECLARATION

The work described in this project was carried out by me at the University of Sri Jayawardenepura under the supervisions of Prof. Arthur Bamunuarachchi, professor of department of Food Science and Technology, University of Sri Jayawardenepura, and Dr. K.K.D.S.Ranaweera, Coordinator; Food Science and Technology Programme and head of the department of Food Science and Technology University of Sri Jayawardenepura and this thesis has not been submitted to any University for another Degree.

20/11/2006

Date



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I, Professor Arthur Bamunuarachchi certify that the statement in the preceding page made by me the candidate is true and that this thesis is suitable for submission to the University of Sri Jayawardenepura for the purpose of evaluation.



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## **Application of Modern processing Technologies in the**

### **Manufacture of Ayurvedic Medicine.**

#### **Honey & Garlic Mix (*Madhu Lasuna*)**

**By: Pathirage Kamal Perera**

#### **ABSTRACT**

Mix of bee honey & garlic (in ayurvedic term *Madhu Lasuna*) is an Ayurvedic remedy which has cardiovascular curing effects (lipid/cholesterol, blood pressure and fibrinolytic activity); chemoprevention; antimicrobial, antifungal, antiprotozoal, antioxidant activities and immunologic activity; how ever its use as *Madhu Lasuna* has been restricted due to difficulties in preparing it and less of keeping quality. Some individuals dislike the smell of garlic and are discouraged to consume garlic cloves kept in bee honey. The compounds of *Madhu Lasuna* mix, which also containing constituent of bee honey and garlic have been found by the chemical analysis carried out. Most of the active ingredients found have been clinically tested by early works. Therefore it is of important to develop a ready to use product which can be easily commercialized. A study was conduct to prepare dehydrated bee honey & garlic mix powder using an advanced drum drying technology and the formulation of novel dosage form (capsules) using the powder.

From the medical point of view in dehydrated powder, major active substances from garlic (*Allium sativum*) play an important role in medicinal aspect. Chemical analysis of the *Madhu Lasuna* powder showed that concentrations of sulfur compounds vary enormously. The compounds were found in bee honey in the present study also plays an important major role giving health benefits to consumer. Correct dose of honey

and garlic mix capsules give medicinal benefits of garlic and bee honey. Most of the indications are clinically tested. This powder was analyzed for its moisture, protein, fat fiber and ash content. The formulation was found to contain 3.87% moisture, 0.2% protein, 0.23% fat, 0.5213% of fiber, and 0.713% ash. Garlic in bee honey dehydrated powder was capsulated in hard gelatinized capsules. The capsules sealed in air tight in cellophane pouches were not deteriorated and the quality was kept high even after ten months.

According to the dose recommended a clove with bee honey should be eaten three times a day. If the smell becomes a problem, use Bee honey & Garlic Mix capsules; take three a day as a prophylactic or two capsules three times a day when disease occurs.

# Chapter-1

## Introduction

Ayurveda is, perhaps, the oldest science of life, a system of diet, healing, and health maintenance. In the past few years this traditional natural healing system, has become popular in the world. Herbal medicines are the major remedy in Ayurveda and traditional medical system. In present herbal remedies have a great demand and it is improved by using novel technology have captured a substantial place in local and international market.

The Objective of this project was to dehydrate Ayurvedic remedy, garlic in bee honey by drum drying method and used the dehydrated powder in formation of dosage form of capsules. Garlic in bee honey has high medicinal value than nutritional value. This remedy widely used for its cardiovascular benefits. It has preventive and curative property for some acute and chronic diseases. Daily used in garlic in bee honey in correct proportion is good remedy to control; hypertension, coronary thrombosis, cerebral thrombosis, high cholesterol levels. Therefore it is very important to develop this product using novel technology.

Drum drying method is an advanced technology in dehydration. This process reduces the moisture content of garlic in bee honey to less than 5%. As a result; the keeping quality of the powder will be enhanced. During dehydration, drums will reach higher temperature. This will enhance flavour compounds to the powder. Due to less contact time with drums during the drying process the nutritional quality and active ingredients will not be affected much. Compared to other garlic in bee honey products in the local market, the proposed novel capsule thought to be of better

quality dosage form. Because it can be ingested as a single dosage without any cross contamination and also it has a good shelf life.

The ingredients in 300mg capsule contain approximately 200mg of drum dried garlic (*Allium sativum*) powder; 50mg of drum dried bee honey and 50mg of drum dried raw rice flour. According to WHO criteria, dried garlic powder 600mg-900mg (equivalent to 1.8-2.7g/day fresh garlic) should be taken as dose per day to obtain health benefits. (WHO, 1999) Drum dried garlic in bee honey remedy the main active ingredients come from garlic powder. Therefore to obtain health benefit, dose should be two capsules three times per day.

The material used to pack the drum dried product is also an important factor and must satisfy the requirement of complete protection of the dehydrated product against moisture, light, air, dust, micro flora, foreign odors and pests. Triple laminated aluminum pouches used to pack the powder once dehydration was completed and it was sealed immediately. Capsules are gelatinized capsules, therefore it is digestible.

The presented thesis described the adopted approach and the results obtained related to the use of Honey & Garlic Mix (*Madhu Lasuna*) in a series of novel technology.

## Chapter-2

### Literature survey

#### 2.1 Garlic (*Allium sativum* L.)

##### 2.1.1 Botanical description of Garlic

**Species:** *Allium sativum* L.

**Family:** Liliaceae

**Part Used:** Fresh or dried bulb

A perennial, erect bulbous herb, 30-60 cm tall, strong smelling when crushed. The underground portion consists of a compound bulb with numerous fibrous rootlets; the bulb gives rise above ground to a number of narrow, keeled, grasses like leaves. The leaf blade is linear, flat, solid, 1.0-2.5cm wide, 30-60cm long, and has an acute apex. Leaf sheaths form a pseudo stem. Inflorescences are umbellate; scape smooth, round, solid, and coiled at first, subtended by membranous, long-beaked spathe, splitting on one side and remaining attached to umbel. Small bulbils are produced in inflorescences; flowers are variable in number and some times absent, seldom open and may wither in bud flowers are on slender pedicles; consisting of perianth of 6 segments, about 4-6mm long, pinkish; stamens 6,anthers exerted; ovary superior,3-locular.fruit is a small loculicidal capsule. Seeds are seldom if ever produced.

##### 2.1.2. General appearance

Bulbus Alli Sativi consists of several outer layers of thin sheathing protective leaves which surround an inner sheath. The latter enclose the swollen storage leaves called “cloves”. Typically, the bulb possess a dozen sterile sheathing leaves within which