Chapter I

Introduction

1.1 Herbals

Herbal products are considered safe and are widely used from the ancient time due to its medicinal qualities, flavour and aroma (Thomas, 1997). Tribal people methodically collected information on herbs and developed well-defined herbal pharmacopeia. Physical evidence of the use of herbal remedies some sixty thousand years ago has been found in a burial site of a Neanderthal man uncovered in 1960 (Solecki, 1975).

Now-a-days, people are conscious towards balanced diet in preventing diseases through herbal products (Blumenthal et al., 1998). The herbal products can be introduced into the human body through food, medicines and cosmetics. The different parts of herbal plants such as leaves, flowers, stem, bark, roots and seeds are utilized for medicinal benefits. Herbal products are administered by different way such as applying to the skin, inhaling, swallowing, drinking and eating. The medicinal benefits of chemicals present in the herbals are referred to active ingredients, and also depend upon number of factors such as plant species, the type of soil, the method of herb preparation, time and season of harvest (Bodeker et al., 2005).

Chinese traditional herbal medicines include approximately twelve thousand herbal products and have been utilized for human healings. Out of them five hundred items are commonly utilized for the treatment of several diseases from ancient times (Li, 2000; Schulz et al., 2001). Several herbal products are utilized in the Indian traditional medicine system five thousand years ago (Morgan, 2002).

The preparations of herbal drugs from the plant parts involve various processes such as harvesting, drying and storage. Standardization of herbal medicine is necessary to produce medicines of high quality. To ensure the quality, efficacy, safety and reproducibility of herbal products, it has to be produced as per the standard norms prescribed (EMEA, 1998).

The various factors to be considered to assess the quality of herbal products through macro and microscopic examination are determination of ash values, extractive
values, foreign organic matter, moisture content, qualitative chemical evaluation, crude fibre, quantitative chemical evaluation, chromatography examination and toxicological studies (WHO, 1992; WHO, 1996).

Herbal products are available in the form of tablets, capsules, powders, syrups and oils. Medicines derived from herbal plants are used as supplements to improve health of human beings, and also for other therapeutic purposes. Herbal tablets are obtained from extracts such as brahmi, trifala and ginger. Herbal oils are obtained from various sources such as wheat grass, neem and rose. Many of the famous Ayurvedic products in the markets such as chyawanprash, churna herbal powder, hair care products, cosmetics, rose gulk, pain relief balm, tulsi cough syrup, green teas and Aloe Vera syrups are herbal products.

1.2 Aloe Vera

The botanical name of Aloe Vera is *Aloe barbadensis*. It belongs to the family of *Liliaceae*. There are over 400 species of Aloe Vera plants in the Lily Family. The main compositions of Aloe Vera are anthraquinones, amino acids, sterols, hormones, vitamins, minerals, enzymes, saponins, lignin, sugars, proteins and water.

Rowe et al., (1940) has reported the utilization of Aloe Vera in the treatment of X-ray burns. Benzoin tincture a compound present in the Aloe Vera which is utilized for healing human wounds, skin burns and constipation (Robbers et al., 1996; Syed, 1996).

The various Aloe Vera products available in the markets are shampoo, gel, body wash, body lotion, tea, sun screen, soothing night cream, face cream, shaving creams, soap, juice, face wash, hair cleanser, oil and powder.

1.3 Aloe Vera as Antioxidant

Human and animals are exposed to toxic materials such as air pollution, water pollution, pesticides, herbicides and inorganic fertilizers in their day to day activities. The metabolic processes within the body also generate toxins that are reactive particles with unpaired electrons; release free radicals inside the body and damage the cells throughout the body. The liver in particular has to detoxify them, and this requires antioxidants. Aloe
Aloe Vera extract has an excellent antioxidant property as it contains vitamin A, C and E (Botes et al., 2008).

Aloe Vera can be introduced internally to our body in the form of Aloe Vera chocolate, Aloe Vera sauce and Aloe Vera jam which provide necessary benefits to the human beings as antioxidants.

1.4 Chocolate

Chocolate has become one of the most popular food types with amazing complexities and levels of flavours. Chocolate has been traded internationally for centuries from underdeveloped to the developed world. Chocolate chip cookies also become very common; and popular in most parts of the world. Chocolate is used in cold and hot beverages, to produce chocolate milk and hot chocolate. Consumption of chocolate especially dark chocolate is growing rapidly because of reported health benefits.

It is a common perception that chocolate is a mood elevator for some people, when they are sad or depressed, experienced a craving for chocolate. On eating chocolate they report that their mood is elevated and they feel better. This elevation in mood is temporary and when this effect wears off again, they revert to their previous state of mind (Drake et al., 2007).

Several types of chocolate available in the markets are dark chocolate, milk chocolate, white chocolate, bittersweet chocolate, unsweetened chocolate, semi-sweet chocolate, vanilla chocolate, strawberry chocolate, pear chocolate, raspberry chocolate, coconut chocolate, caramel chocolate and fruit punch chocolate. Today various herbal based chocolates available in the markets are mint chocolate, peppermint chocolate and ginger chocolate.

The various ingredients used in the study for Aloe Vera chocolate preparation are Aloe Vera juice, sugar, skimmed milk powder, cocoa powder, butter, flavour and essence.

1.5 Sauce

Sauces are main food ingredients today which can be added to main dishes, vegetables, fruits and desserts. Sauces are of high fat content, which are normally utilized
for other dishes as they add flavour, moisture and visual appeal. However today’s culinary professionals uses new techniques to make delicious sauces with less fat and less salt (sodium). As sauces have sweet taste, it can be easily added to other foods to improve their taste and appearance. The qualities of sauce such as rich flavour, high liquid content, and soft nature make them ideal for addition to other food materials (Batchelor et al., 2000).

Several types of sauces available in the markets are barbecue sauce, bechamel sauce, cheese sauce, chilli sauce, chocolate sauce, custard sauce, espagnole sauce, hollandaise sauce, marinara sauce, mayonnaise sauce, mint sauce, pesto sauce, sweet sauce, sour sauce, tartar sauce, tomato sauce and veloute sauce. Today various herbal based sauces available in the markets are sicilian garlic sauce, garlic butter sauce, lemon herb sauce, herbal pepper sauce, mushroom sauce, baby corn sauce and coriander leaf sauce.

The various ingredients used in the preparation of Aloe Vera sauce in this study are Aloe Vera juice, sugar, salt, chilli powder, cardamom, cinnamon, garlic cloves, ginger and onion.

1.6 Jam

Jam is one of the most attractive food products, which are liked by people of all ages due to its taste, flavour and nutritional health benefits. Jams are used in large scale by various food industries to provide flavour to food products, and also to sweeten products like bread, biscuit, cookies, yogurt and pastries (Lal et al., 1998).

Several types of jams available in the markets are strawberry jam, blueberry jam, cherry jam, mixed fruit jam, raspberry jam, blackberry jam, peach jam, orange jam, cranberry jam, mango raspberry jam, strawberry vanilla jam, apple pie jam, apricot jam, pineapple jam, plum jam, sugar free blackberry jam, gooseberry jam and rose hip jam. Today various herbal based jams are available in the market such as chyawanprash, organic herbal jam, lemon herbal jam and chilli jam.

The various ingredients used in the preparation of Aloe Vera jam in this study are Aloe Vera juice, sugar, citric acid and pectin.
1.7 Objectives of the Research

In view of the aforesaid, the objectives of the present research work are

- To extract Aloe Vera juice from Aloe Vera plant
- To produce Aloe Vera chocolate using Aloe Vera juice, sugar, cocoa powder and skimmed milk powder
- To optimize selected ingredients for production of Aloe Vera chocolate using sensory evaluation by Response Surface Methodology (RSM)
- To produce Aloe Vera sauce using Aloe Vera juice, sugar, salt and chilli powder
- To optimize selected ingredients for production of Aloe Vera sauce using sensory evaluation by RSM
- To produce Aloe Vera jam using Aloe Vera juice, sugar, pectin and citric acid
- To optimize selected ingredients for production of Aloe Vera jam using sensory evaluation by RSM
- Experimental validation of the second order polynomial model of RSM for Aloe Vera chocolate, Aloe Vera sauce and Aloe Vera jam
- To analyze the shelf life of the Aloe Vera products
- To study the drying characteristics of Aloe Vera gel under optimized conditions
1.8 Structure of the Thesis

Chapter I gives the introduction about the fortification of Aloe Vera in various processed foods. It also emphasizes on the objective of the present work. Chapter II presents literature review on properties and uses of various herbs and Aloe Vera, and also covering the various processed food products such as chocolate, sauce and jam. Chapter III describes the materials used and methods adopted in this work along with its sensory analysis. In Chapter IV the findings of this study are presented and discussed in a critical way along with the mathematical models for drying characteristics of Aloe Vera gel. In Chapter V the findings of this work are concluded and suggestions for further work are given.