

CHAPTER I

INTRODUCTION

Centella asiatica Linn., also known as Gotu kola and Indian pennywort, is an ethnomedical plant used in different continents by diverse ancient cultures and tribal groups. Gotu kola has a long history of use, dating back to ancient Chinese and Ayurvedic medicine. It has been widely used medicinally since 1700 AD (Brinkhaus et al., 2000). It has been used to treat leprosy in Mauritius since 1852; to treat wounds and gonorrhoea in the Philippines; and to treat fever and respiratory infection in China. In Sri Lanka, the singhaless noted that elephants often consumed the Gotu kola plants, and given the longevity of elephants, proposed that the plant may hold health benefits for humans. Gotu kola was incorporated into the Indian pharmacopoeia in the 19th century, and has been viewed as a rejuvenating herb. The French accepted it as a drug in the 1980s. The active ingredients of *Centella asiatica* were determined to be triterpenoids which include asiatic acid, asiaticoside, madecassic acid and madecassoside. Asiaticoside was first isolated and purified in 1940, and systemic clinical studies with *Centella asiatica* began in 1945 (Ulbricht and Basch, 2005). There are many therapeutic uses of *Centella asiatica* such as chronic venous insufficiency, varicose vein, wound healing and ulcerations.

Garcinia mangostana Linn., mangosteen, is a tree found in Sri Lanka and other South East Asian countries. The hull (pericarp) of the fruit of the mangosteen tree is used in Thai indigenous medicine as an inflammatory agent, astringent, wound healing agent and in the treatment of skin infections and diarrhoea (Mahabussarakum et al., 1986). The fruit hull of this plant has been reported to contain the major products, mangostin, and the minor xanthones (Paveen and Khan, 1988 and Balasubramanian and Rajagopalan, 1998).

Many pharmaceutical products are semisolids, including ointments, pastes, creams, gels and suppositories. The important physical properties of these systems can be described by various fundamental rheological parameters that define deformation and flow (elasticity and viscosity). Hydrophobic base is semisolid dosage form which composed of mineral oil and long chain aliphatic hydrocarbon polymer. Thus, the rheological properties of these preparations are somewhat important and should be evaluated. The result of these evaluations may be indicate that whether the preparations are appropriate to formulate the dosage form. Viscosity and the change of viscosity with temperature are examples of rheological parameters that have been reported by several researchers (Davis et al., 1980).

There are many synthetic and natural polymers that can be used as gelling agent. Gelling agents used in pharmaceutical products are classified in many groups according to the source of its origin such as natural polymers e.g. alginates, carrageenan, pectin and chitosan, acrylic polymers e.g. carbomer, cellulose derivatives e.g. methylcellulose and carboxymethylcellulose, colloidal disperse solids e.g. clays and surfactant e.g. poloxamer. Chitosan is natural polymer that prepared by deacetylation of chitin and can be used as one of gelling agents. Using chitosan as one of pharmaceutical excipients is very popular in the recent research because it is biocompatible and biodegradable polymer and also contain positive charge that can attach to human tissues which has negative charge.

From the clinical treatment outcomes of asiaticoside from *Centella asiatica* and mangostin from *Garcinia mangostana*, in this investigation, it was aimed to develop the suitable formulation of asiaticoside oral paste and mangostin oral paste for treatment of oral ulcers and getting the good stability by evaluating the physicochemical properties and to test the products which stored under the recommended condition followed the Thai FDA guidance.

The objectives of the present study were:

1. To develop and evaluate physicochemical properties of hydrophobic base alone and in combination with suitable gelling agents for the use in oral paste formulations containing herbal extracts.
2. To study the stability of asiaticoside and mangostin oral paste under accelerated condition compared with the ambient condition for 4 months.