

CHAPTER I

INTRODUCTION

Nowadays, active substances derived from herbal plants have a major role in both pharmaceutical and cosmetic industries. Many products from natural substances were developed under new drug delivery technologies for added valuable cost. Since the sources of the herbal plants are commonly found, it is possible to produce a high quantity with low cost.

Garcinia mangostana Linn. or mangosteen is one of the medicinal plants that have been used for a long time for treatment of both normal and infected wounds. It was also used for diarrhea and dysentery (Fransworth and Bunyaphatsara, 1992). Phytochemical studies indicated that the fruit rinds contain various xanthenes and mangostin is the most active component. These xanthenes show many considerable pharmacological activities such as antimicrobial, anti-inflammatory, antioxidative, antihistamine, antiserotonin and antitumor activities (Wong, 2002). Previous studies showed that the extract from this plant exhibited significant antibacterial activities against *Streptococcus mutans*, bacteria causing dental caries and dental plaque and *Porphyromonas gingivalis*, bacteria that causes periodontitis and oral malodor (Tan, 2004).

Oral hygiene has primary purpose to reduce or counteract the effects of bacterial populations which cause caries, malodor, staining and periodontal diseases. Oral cleansing and breath freshening practices should be conducted repeatedly throughout the day. However, it may be inconvenient sometimes. Typical methods of oral cleansing and hygiene including brushing, flossing, gargling and tongue cleansing are well suited for the privacy of one's home (Leung, Leone, and Kumar, 2003).

As solution to these problems, a fast dissolving film with breath freshening and intraoral bacteria inhibitory benefits is a convenient delivery for oral cleansing

and freshening breath. Fast dissolving films are the dosage forms that have been developed for providing pharmaceutical and/or cosmetic benefits. Fast dissolving films refer to the thin and flexible films that can rapidly dissolve in oral cavity within a few second or minutes, without the need to drink or chew (Xu et al., 2002; Kulkarni, Kumar, and Sorg, 2003). Additionally, there are many advantages for delivery of the medicines to pediatric and geriatric patients, who have difficulty in swallowing or chewing solid dosage forms.

Now, there are many successful reports in development of the fast dissolving films released into the market. One of them is film that claims for cosmetic benefit, breath freshening and inhibitory growth of bacteria in oral cavity such as Listerine[®] PocketPak. In another published research, the fast dissolving film containing salbutamol sulphate as pharmaceutical agent was developed for treatment of acute and chronic asthma (Mashru et al., 2005). Moreover, natural antiseptic agents such as magnolia bark extract and cinnamaldehyde were delivered into the oral cavity using fast dissolving film preparation (Maxwell and Greenberg, 2004a, 2004b).

With applicable fast dissolving dosage form and application of mangosteen extract, orally fast dissolving film containing *Garcinia mangostana* extract was developed for oral hygiene products to provide antimicrobial and breath freshening effect. In this study, the investigation of appropriate polymers as film former was carried out for desirable dissolution time, mechanical properties, stability and inexpensiveness.

The purposes of this study were as follows:

1. To develop orally fast dissolving films containing *Garcinia mangostana* extract.
2. To investigate the physicochemical properties of orally fast dissolving films with and without *Garcinia mangostana* extract.
3. To investigate the chemical stability of *Garcinia mangostana* extract in orally fast dissolving films.
4. To evaluate antimicrobial activity of orally fast dissolving films containing *Garcinia mangostana* extract.