

# CHAPTER I

## INTRODUCTION

In recent years many successful medications derived from medicinal plants have received a great deal of attention. Their safety, effectiveness and various pharmacological activities led to the widely application in prevention and treatment of illness through self medication.

*Garcinia mangostana* Linn. or mangosteen in common name is one of the medicinal plants that have traditionally been used for a long time for the treatment of wounds (both normal and infectious) and diarrhoea. Phytochemical investigations indicated that its fruit rind contains various xanthenes, for instance, mangostin (most active component), grartanin, 8-deoxy gartanin and garcinones (นันทวัน บุญประภัสร์ , 2533; Wilawan Mahabusarakam, Pichaet Wiriyachitra, and Saowaluk Phongpaichit, 1986; Govindacharit et al., 1971; Sen et al., 1980). These xanthenes have demonstrated several pharmacological activities, for example, antimicrobial, antiinflammatory, anti-ulcer, antihistamine etc. (นันทวัน บุญประภัสร์ และ อรรนุช โชคชัยเจริญพร, 2542; Farnsworth and Bunyaphrathatsara, 1992)

Since aphthous ulcers are commonly found oral mucosal diseases in Thai people, from the pharmacological activities of *Garcinia mangostana* Linn., it is interesting to investigate the application of *Garcinia mangostana* Linn. extract for the treatment of the diseases. However, only a few studies have developed and evaluated the pharmaceutical dosage form of this plant.

In this study, a buccal mucoadhesive bilayered film was designed. A mucoadhesive bilayered film can enhance the residence time and permit localization at target site of action. Furthermore, the backing layer can increase the efficacy of the device by ensuring unidirectional drug release and withstanding salivary flushing for prolonged pharmacological effects (Castellanos, Zia, and Rhodes, 1993).



Recently many studies have extensively investigated the application of biodegradable mucoadhesive polymers. Chitosan is one of biopolymers that have been widely used in mucoadhesive drug delivery due to its excellent mucoadhesive performance and its favorable biological properties such as biodegradability, nontoxicity and biocompatibility (Mathiowitz, 1999). For these reasons, chitosan was selected this study in the formulation of mucoadhesive film. Then, its physical and mucoadhesive properties were evaluated in comparison with some cellulose derivative mucoadhesive polymers.

Although, the preparations of *Garcinia mangostana* cream were formulated and the clinical study with chronic ulcerated patients was performed (วัฒน์ชัย ปานจินดา, 2535), the stability study of *Garcinia mangostana* Linn. extract in the preparations has not yet been investigated before. Therefore, in this investigation, the stability of *Garcinia mangostana* Linn. extract buccal mucoadhesive film was studied under accelerated condition by the method of Cartensen (1990). Certainly, in order to accomplish the stability study, an effort to develop a reliable and reproducible quantitative analytical method for *Garcinia mangostana* Linn. extract in mucoadhesive film was performed.

ศูนย์วิจัยทรัพยากร  
จุฬาลงกรณ์มหาวิทยาลัย



The purposes of the study were as follows :

1. To prepare *Garcinia mangostana* Linn. extract mucoadhesive films using various bioadhesive polymers.
2. To investigate antimicrobial activity and minimal inhibitory concentration against some bacteria of *Garcinia mangostana* Linn. extract obtained in this study.
3. To compare and evaluate physical and pharmaceutical properties of mucoadhesive films from various bioadhesive polymers including chitosan, sodium carboxymethyl cellulose , hydroxypropyl methycellulose and carbopol 934
4. To investigate the effects of molecular weight of chitosan, type and concentration of acid used in preparation of chitosan solution on physical and mucoadhesive properties of films.
5. To characterize and evaluate the physical and mucoadhesives properties of *Garcinia mangostana* Linn. extract buccal mucoadhesive films
6. To investigate the release characteristics of mangostin from *Garcinia mangostana* Linn. extract buccal mucoadhesive films
7. To evaluate the stability of *Garcinia mangostana* Linn. buccal mucoadhesive films by quantitative analysis of mangostin under accelerated conditions.