CHAPTER I

INTRODUCTION

Herpes simplex viruses (HSV) are DNA viruses and cause human infections to several of body sites, which were recognized as an important public health problem over the world (1). HSV are divided into two distinct types; HSV type 1 (HSV-1, oral or non genital type) and HSV type 2 (HSV-2, genital type). Their genomes are similar in organization and show 50% sequence virus DNA homology, however, they can be distinguished by restriction enzyme analysis of viral DNA, ganglion of latentcy, buoyant density, the reaction of type specific antisera, mode of transmission and other biological properties (2,3). HSV are transmitted by contact of a susceptible person with an individual excreting virus. HSV-1 is spread by respiratory droplet or by direct contact with infected saliva, whereas HSV-2 is transmitted sexually or from a maternal genital infection to a newborn (3). HSV cause the diseases of mucous membranes such as gingivostomatitis, herpes labialis, keratoconjunctivitis (4), visceral HSV infection of the immunocompromised host, HSV encephalitis (5), Kaposi's varicella-like eruption and an association with erythema multiforme. HSV-1 was more frequently associated with non genital infection (infection above the belt), infections are usually limited to the oropharynx and HSV-2 is usually transmitted by genital route (infection below the belt), it causes genital herpes and neonatal herpes.

Most of primary HSV infections are usually mild or asymptomatic. After virus had replicated first at the site of infection then virus invaded local nerve ending and was transported to dorsal root ganglia; in latentcy state. Appropriate stimuli, include injury, fever, physical or emotional stress and exposure to ultraviolet light can reactivate virus to replicate, and cause recurrent infection (2,3,6).

In Thailand , HSV infections have frequently found in population. Antivirals for the treatment of infections such as idoxuridine, trifluridine, vidarabine are toxic and poor

efficacy, whereas acyclovir (ACV) is good efficacy but very expensive. Recently, many papers reported the resistance in treatment by ACV in many parts of the world (7-10). Trisodium phosphonoformate (PFA, foscarnet), the antiviral agent which inhibit HSV-DNA polymerase, is used to treat ACV-resistant virus, but it showed strong side effect. So, foscarnet is recommended for only severe infection treatment (11). Therefore, a new approach to the study of alternative drugs, especially developing of medicinal plants, is interesting field over the world. Many studies indicated medicinal plant extracts showed antiviral activity against HSV (12-15).

In Thailand, some Thai traditional text books claimed that HSV infections were treated by *Centella asiatica* Urban., *Cassia alata* Linn., *Annona squamosa* Linn., and *Coccinia grandis* Voigt (16-18). There are few research works show that genital herpes suspected patients were treated with cream base, developed from the extract of *Clinacanthus nutans* which was as effective as ACV (19). However, the other Thai medicinal plants were not studied and investigated to understand the efficacy of antiviral activity of medicinal plants extracts against virus.

Pengsuparp et al. (20) reported that methanol extracts of 15 plants collected in Thailand showed antiviral activity against HSV-1 strain KOS and HSV-2 strain 186. From those 15 plants, five plants that had high efficacy and could be collected simply in Chulalongkorn University were used in this study. These plants are *Cerbera odollam* Gaertn., *Clausena excavata* Burm.F., *Coleus amboinicus* Lour., *Phyla nodiflora* (L.) Greene. and *Thevetia peruviana* Schum.

Therefore, the propose of this study is to evaluate antiviral activity against HSV strain 186 and HSV-2 isolates from patients attending sexually transmitted disease clinics of ACV and extracts from *Cerbera odollam* Gaertn., *Clausena excavata* Burm.F., *Coleus amboinicus* Lour., *Phyla nodiflora* (L.) Greene. and *Thevetia peruviana* Schum. The results of this study will show in efficiency of ACV and medicinal plant extracts against HSV strain 186 and HSV-2 isolates and may lead to development of medicinal plant extracts for alternative drugs in treatment of HSV infection.