

CHAPTER 1

INTRODUCTION

Viral infectious disease caused by herpes simplex viruses (HSV) is an important health problem since the numbers of patients are increased and the infection is not entirely cured by antiviral drugs. Herpes simplex viruses are divided into 2 types; HSV-1 and HSV-2. Both types of HSVs are characterized by their propensity of latency in sensory neural ganglia. Thus, the viruses remain in the body for the lifetime and latent viruses are reactivated from nerve ganglia leading to the main problem of disease treatment in both developed and developing countries (Serkedjieva and Ivancheva, 1998). Clinical presentations of HSV infection are ranging from asymptomatic, mucocutaneous to central nervous system infection. HSV infection is followed by rounds of lytic replication, which occurs at peripheral sites involved surfaces or squamous epithelial sites and continues until it is terminated by host immunity (Daheshia *et al.*, 1998).

HSV-1 infectious disease causes fever blisters. Vesicle lesions occur around lip, oral cavity and facial area. Infections of cutaneous, mucous and esophageal membranes and cerebrum are also occurred. HSV-2 is generally associated with genital infections transmitted through sexual activity. These pathologies may result from a primary infection or alternatively from a reactivation of a latent infection. Moreover, HSV can reactivated from latency state by stimuli such as local psychological stress, physiological stress, fever, radiation, menstruation, immune suppression and other related factors. The site of latency is the trigeminal

ganglion in HSV-1 infection and the sacral ganglion in HSV-2 infection (Brook *et al.*, 2010; Kott *et al.*, 1998).

Herpes simplex virus infection is usually managed with effective anti-viral synthetic drugs. The drugs are now available such as the nucleoside analogue, acyclovir (ACV), which is the drug of choice for HSV treatment (Tolo *et al.*, 2010). Moreover, other nucleoside derivatives, famciclovir, ganciclovir, penciclovir, valaciclovir and vidarabine have been approved for treatment HSV infection worldwide (Lipipun *et al.*, 2003). Although, synthetic drugs are generally used to reduce the severity of infection and increase wound healing time. However, these synthetic drugs have high cost, and viral resistance against antiviral drugs may emerge after receiving long-term prophylactic treatment. Virus latency also remains unsolved problem. These lead to important clinical problems that affect high dose of drug to treat the disease and ineffective therapy (Coen, 2003; Greco *et al.*, 2007; Kott *et al.*, 1998). However, the effective application of newly synthetic drugs to treat HSV infection have been approved and continuously being developed for more effective inhibitors and the most specific target for drug action on viral metabolite pathways. In Thailand, traditional medicinal plants have been widely used in folk medicine for their health benefits or treatment various infectious and non-infectious diseases for long time. Many medicinal plants are used as ingredients source of many potential beneficial bioactive compounds such as carotenoids, flavonoids, diterpenes, and stigmasterols in order to treat microbial infection (Kumar *et al.*, 2009; Murakami *et al.*, 1995). The plant are also used as anti-oxidant, anti-inflammation, anti-thrombotic, anti-cancer, immunostimulatory, hypoglycemic and hypotensive agents (Serkedjieva and Ivancheva, 1998). Thus, the knowledge of ethnopharmacology is

alternative choice for scientist to search for the effective anti-HSV from natural source and new bioactive compounds from plants as potent inhibitors on viral growth.

In this study, efficacy of some Thai medicinal plant extracts was evaluated on modes of HSV inhibition.

Objectives of the study

1. To study anti-HSV activities of some medicinal plant extracts.
2. To investigate mode of HSV inhibition of some medicinal plant extracts.
3. To characterize some plant compounds that conferred anti-HSV activity.