CHAPTER I

INTRODUCTION

1.1 Background and Rationale

Alcohol induced liver injury is one major cause of health problem worldwide (Saravanan *et al.*, 2006; สำนักงานกองทุนสนับสนุนการสร้างเสริมสุขภาพ, 2547).

The National Statistical Office, Thailand in the year 2003 reported that alcoholic beverage consumption of Thai people aged more than 11 years was 18.61 millions people or 35.46 % of the population. Most of the consumers were working men aged 25 to 44 and women alcoholic consumption is also increased as compared with the last report. The average rate of alcoholic beverage consumption in Thai people was 58 liter/person/year, 3 times from the year 1989 (20.2 liter/person/year). In the near future, the number and the quantity of alcoholic beverage consumption of Thai people expect to be doubled in every 3 years. (ศูนย์วิชาการเพื่อป้องกันแก้ไขปัญหาสุรา, 2547; สำนักงานกองทุนสนับสนุนการสร้างเสริมสุขภาพ, 2547).

When the rate of alcoholic beverage consumption trends to increase, health problem from over alcoholic consumption will increase too, especially liver disease. Alcohol affects the liver both nutritional disturbances and damaging cells, resulting in the loss of normal structure and function of the liver which leads to liver disease. However, the most important way of the preventing health problem from alcohol is to stop drinking. Other interesting way is the use of drug or herb aiming for protection or treatment alcohol induced liver injury.

There are many herbs using in folk medicine and found to be effective in protection and treatment of several diseases. In recent years, some of herbs has been studied and claimed to be useful in protection and treatment with safe use, leading to the development of new drug (Rotblatt and Ziment, 2002).

In the absence of reliable modern hepatoprotective drugs, there are a number of traditional medicines recommended for treatment of liver diseases. Many herbs reportedly possess hepatoprotective effect such as *Silybum marianum* (Flora *et al.*, 1998), *Tridax procumbens* (Ravikumar *et al.*, 2005), *Strychnos potatorum*

(Sanmugapriya and Venkataraman, 2006), *Andrographis paniculata* (Pramyothin *et al.*, 1994), *Picrorhiza kurroa* (Saraswat *et al.*, 1999), *Aquilegia vulgaris* (Liebert *et al.*, 2005) etc.

Phyllanthus amarus Schum. et. Thonn. is one of herbs with potent protective effect against paracetamol, carbon tetrachloride and galactosamine. It enhanced hepatic recovery after ethanol induced injury. (พิศมัย เหล่าภัทรเกษม และคณะ, 2544; วันดี อุดมอักษร, 2543; Harish *et al.*, 2006; Kongstan, 2000; Prakash *et al.*, 1995; Syamasundar *et al.*, 1985; Umarani *et al.*, 1985; Venkatesan *et al.*, 2003; Walaiphachara, 1994; Wongnava *et al.*, 2543). The data of the hepatoprotective activity of *Phyllanthus amarus* in ethanol induced hepatotoxic rats in the previous study is still not clear. This study aimed to conduct a scientific experiment using the preparation of *Phyllanthus amarus* extract at different dose from previous report to assess hepatoprotective effect in ethanol induced hepatotoxic rats.

1.2 Objectives

To investigate the hepatoprotective effect and its possible mechanism of aqueous extract from *Phyllanthus amarus* Schum. et. Thonn. in ethanol induced hepatotoxic rats both acute and sub-acute toxicity studies.

1.3 Hypothesis

Aqueous extract of *Phyllanthus amarus* has hepatoprotective effect against ethanol induced hepatotoxic rats by its possible mechanism as antioxidant, inhibiting fatty liver formation and pro-inflammatory cytokines production.

1.4 Scope

Hepatoprotective effect in the present study has 2 meaning as protective and curative effects as follows:

1.) Experiment I is the study of protective effect of aqueous *P. amarus* extract: *P. amarus* extract was administered before the induction of liver injury by ethanol.

2.) Experiment II is the study of curative effect of aqueous *P. amarus* extract: *P. amarus* extract was administered after ethanol induced liver injury.

Clinical chemistry parameters and histopathological examination were used for the assessment of hepatoprotective effect. Silymarin was used as the reference hepatoprotective agent in both experiments.

1.5 Expected benefit and Application

Results from this study may act as the supportive data in the further development of *P. amarus* for its clinical study in person with habitual alcohol drinking. This will be part of quality of life improvement since alcohol abuse is one major problem of Thai community.