Thesis Title Protective Effect of Elephant Garlic (*Allium Ampeloprasum*) Extracts on Carbon Tetrachloride Induced Hepatotoxicity in Rats

Name Penpark Roongkamnertwongsa

Degree Master of Science (Pathobiology)

Thesis Supervisory Committee

Subhkij Angsubhakorn D.V.M., M.S.

Apichart Suksamrarn Ph.D.

Somphong Sahaphong M.D., Ph.D.

Suda Riengrojpitak Ph.D.

Date of Graduation 22 March B.E.2536 (1993)

## ABSTRACT

Protective effect of three different elephant garlic extracts, garlic volatile oil (GVO), petroleum ether extract (PeE) and ethanol extract (EtE), against carbon tetrachloride($CCl_4$) induced hepatotoxicity was studied in male Wistar rats. The animals were treated with GVO, PeE and EtE prior to $CCl_4$ via stomach tube. The results demonstrated that GVO can protect liver damage induced by $CCl_4$ more than PeE do. Serum transaminase activities of GVO pretreated rats decreased to 39%, for SGOT, and 45%, for SGPT, of $CCl_4$ group, while those of PeE pretreated rats decreased to 75% and 65% of $CCl_4$, respectively. For EtE pretreatment, the decrease of serum transaminase activities was not significant from $CCl_4$ treated rats. Microscopically, the centrilobular necrosis of hepatic tissue in GVO pretreated rats was much reduced when compared to the other extracts.

The toxicity of elephant GVO was determined by a single oral $LD_{50}$ in male Wistar rats. By probit method, the oral $LD_{50}$ value was 1,202 $\pm$ 55 mg/kg bw. Histopathologic changes of the treated rats consisted of degeneration and necrosis of hepatocytes, tubular epithelial cell degeneration, the seminiferous tubules in the testes showed the decrease of spermatocytes and the spleens showed the increase of hemosiderin laden macrophages in the red pulp.

Furthermore, the dose response of elephant GVO on $CCl_4$ was also studied. The animals were treated with GVO 100, 200, 300 and 400 mg/kg bw prior to $CCl_4$. It was found that the higher doses of GVO pretreatment can protect liver injury produced by $CCl_4$ more than the lower doses, by means of the gradually decrease of SGOT and SGPT activities. Microscopically, the higher doses of GVO pretreatment also showed much reduce of the hepatic necrosis. These findings suggest that pretreatment with elephant GVO can protect liver injury induced by $CCl_4$ in a dose dependence.