CHAPTER I

INTRODUCTION

During menopause a marked decrease in the endogenous production of estrogen occurs. This decrease in estrogen levels has been linked with an increase in the incidence of menopause symptoms such as hot flushes and drying of the vaginal epithelium. Continued low levels of estrogen after menopause can lead to other health conditions such as osteoporosis, depression and cardiovascular disease. As estrogen has been shown to were an influence on cognitive function and skin health.

Synthetic estrogen Hormone Replacement Therapy (HRT) has been the primary allopathic means of treating the symptoms of menopause, but not without its own set of problems. HRT has associated with an increased risk of endometriosis, endometrial cancer and breast cancer (Draco, 2000).

Phytoestrogens are week plant estrogens that are similar in structure and have ability to mimic the action of the female hormone estrogen . Phytoestrogens rich diet can help curb symptoms of menopause. They prevent bone disease, promote cardiovascular wellness and lower risk of certain cancer. A higher intake of food-based phytoestrogens is probably the reason why many Asian and Orientals women have an easier time and experience less hot flushes during menopause than women in western society. It is well established that the traditional Coronary Heart Disease (CHD) is the major cause of morbidity and mortality in women. The incidence of CHD in premenopause is low, but it increases dramatically after menopause. This difference suggests that endogenous estrogens are cardioprotective.

Studies on isoflavones, phytoestrogens have the ability to slow the development of atherosclerotic disease lower lipid levels and inhibit low-density lipoprotein oxidation. Maintaining a hormonal balance is a key factor preventing cardiovascular disease. Phytoestrogens lower risk of breast, endometrial and ovarian cancers by acting as estrogen police and maintaining estrogen levels in the body (AFIC, 2002).

The native plants, White Kwao Keur, *Pueraria mirifica* Airy Shaw and Suvantabandhu is one of the Thai folk medicinal plants (เต็ม สมิตินันท์ , 2523). According to Thai traditional medicine, this rejuvenating herb is recommended for both aged men and women for its efficacy to grow hair, strengthen and darken existing ones, help improve complexion, increase blood circulation , increase energy and vigor leading to more reflexive body movements (หลวงอนุสารสุนทร, 2474). The enlarge underground tuber accumulate "phytoestrogens". The compounds that make *P. mirifica* different from any other phytoestrogens containing plants are miroestrol and deoxymiroestrol, which possess highest estrogenic activity (Chansakaow *et al.*, 2000a).

However, the cardioprotective of *P. mirifica* have never been investigated. Few studies regarding the subchronic toxicity as well as the cholesterol-lowering effect of *P. mirifica* were reported (ทรงพล ชีวะพัฒน์ และ คณะ, 2543). Therefore, the objective of this study were primarily to investigate the effect of *P. mirifica* on vascular function of isolated aorta in high cholesterol-fed rats and ovariectomized rabbits. Moreover, its effect on blood clinical biochemistry parameters were also monitored at the same time.

Hypothesis

P. mirifica demonstrated a protective effect on vascular function in high cholesterol-fed rats and ovariectomized rabbits.

Benefit gained from the study

1. A preliminary data on *P. mirifica* whether it possesses endothelium-dependent and –independent vascular responses on an isolated aortic rings.
2. A preliminary subchronic toxicity data as well as the potentially lipid-lowering effect of *P. mirifica* in high cholesterol-fed rats and ovariectomized rabbits.

Study design and process

The following processes were performed :

1. Part 1 : An ex vivo study in rats.
   - 1.1 Male rats treated with high cholesterol and dosing for 90 days.
   - 1.2 Blood collecting.
   - 1.3 Analysis of blood biochemistry parameters.
   - 1.4 Determination of vascular functions.

2. Part 2 : An ex vivo study in rabbits.
   - 2.1 Ovariectomized rabbits dosing for 90 days.
   - 2.2 Blood collecting every 4 weeks.
   - 2.3 Analysis of blood biochemistry parameters.
   - 2.4 Determination of vascular functions.
   - 2.5 Examination of morphological changes in endothelial cell by scanning electron microscope.

3. Data collecting and analysis.
4. Writing a thesis.