Chapter I

Introduction

Among the popular Thai herbal plants, Kwao Krua plants are the most interesting ones. This group of plants comprising of white Kwao Krua *(Pueraria mirifica* Airy Shaw & Suvatabandhu), red Kwao Krua (*Butea superba* Roxb.) and black Kwao Krua (*Mucuna collettii* Lace). The plants have long-time been used in folklore medicines. *Pueraria mirifica* are used for improving human physical appearance such as enlarging breasts, re-growing hair, promote black hair and improving body complexion. It was believed to rejuvenate and prolong life after orally taking the crude drug with *P. mirifica* and honey. *B. superba* and *M. collettii* have been consumed among Thai males for potency purposes (Suntara, 1931).

Human diet contains several plant-derived compounds as phytoestrogens, non-steroidal weakly estrogenic compounds (Murkies *et. al.*, 1998), mainly found in soybean. Phytoestrogens interact with ER and establish estrogenic effects in a number of *in vitro* and *in vivo* models (Sathyamoorthy and Wang, 1997, Kim *et al.*, 2003). Phytoestrogens act as weak estrogenic and antiestrogenic actions. (Murkies *et al.*, 1998). For breast tumor cells *in vitro*, phytoestrogens could compete with 17B-estradiol for binding with ER protein, induce activity of estrogen-responsive reporter gene constructs in the presence of ER protein (Tamir *et. al.*, 2000 and So *et. al.*,1997).

The cultured cells could act as model of physiological function *in vivo*. The estrogen dependency of human breast cancer has been used to study the role of estrogenic organic compounds from plants. MCF-7 is an estrogen receptor alpha-positive human breast cancer cell line. Several studies have shown that low concentrations of phytoestrogens could induce proliferation of MCF-7 cells. Conversely, high concentrations of phytoestrogens could inhibit proliferation of human breast carcinoma cells (Ju *et. al.*, 2000, Peterson *et. al.*, 1998 and Pagliacci *et.al.*, 1994)

At presents, plant-derived products are rapidly developed into dietary supplements and cosmetic products for both domestic consumption and exportation. The basal data should be rapidly and fully established to support the product development. Our study will focus on evaluation of proliferative and antiproliferative of the 3 plant extracts to MCF-7 cells. The data should establish the possibility to screen for plants with high proliferative effect and monitor it as a phytoestrogen source. The plants with high antiproliferative effects are also interesting as they might be good sources of materials to be developed into anti-breast cancer drugs.

Aims of the study are as followed:

Comparison of proliferative and antiproliferative effects of various collected *P. mirifica, B. superba,* and *M. collettii* extracts on the growth of human mammary carcinoma (MCF-7) cells