CHAPTER I

INTRODUCTION

The Thai phytoesytrogen-rich herb, *Pueraria mirifica,* with a domestic name of "White Kwao Krua", has turned the world interests into commercialized development of the plant products in various forms including dietary supplements, traditional medicines, beverages and cosmetics. One problem initiated from this phenomenon is the heavily harvest of the wild plant tubers. The plant was found to contain high amount of phytoestrogens with potent estrogenic effect (Cain, 1960; Chansakaow *et al.*, 2000[a]). The crude powder was confirmed to be an effective alternative treatment for menopausal symptoms (Muangman and Cherdshewasart, 2001) with negative results of toxicity tests in animals and humans (Cherdshewasart, 2003). In addition; the cellular action of the plant extract needed metabolic activation (Lee *et al.*, 2002) with anti-proliferation effects to HeLa cells and MCF-7 (Cherdshewasart *et al.*, 2004[a] ;Cherdshewasart *et al.*,2004 [b]).

Analysis of the plant active ingredients by HPLC is an accepted analytical method for herbal materials used in preparation of traditional medicines, dietary supplements, plant extracts as well as cosmetics. Thus this method has been adapted for studying the isoflavonoid contents of *P. mirifica* and resulted in finding of highly diversed isoflavonoid contents in *P. mirifica* population (Cherdshewasart *et al.* 2007[a]).

The plant estrogenic activity can be analyzed both *in vivo* and *in vitro*. The cell proliferation assay is one of the *in vitro* tests, usually with MCF-7—human breast cancer cell. This method has been used for studying the estrogenic activity of *P. mirifica* and correlation analysis with plant isoflavonoids (Cherdshewasart *et al.* 2007[b]).

According to a large-scale survey of the distribution and diversity of the plant since 1998, at least 28 provinces are confirmed to be the exiting habitat of the plants (Cherdshewasart *et al.* 2007[a]) with a varied degree of estrogenic activity in vaginal cornification test (Malaivijitnond *et al.*, 2006; Cherdshewasart *et al.* 2007[c]), antioxidant activities (Cherdshewasart et al., 2007[d]) and anti-proliferation effects to MCF-7 (Cherdshewasart *et al.*, 2007[b]). This study will focus on the monthly analyzed isoflavonoid contents during 1 year in relation with estrogenic activity by MCF-7 proliferation assay.

Aims of the studies are as follows;

- To evaluate isoflavonoid contents of monthly collected tubers from 2 clones of *P. mirifica* since March 2005 to February 2006 by HPLC.
- To evaluate the estrogenic activity of monthly collected tubers from 2 clones of *P. mirifica* since March 2005 to February 2006 by MCF-7 proliferation assay.
- To correlate isoflavone contents and estrogenic activity of the plant samples with temperature and rainfall amount of the field trial site.