EVALUATION OF ESTROGENIC ACTIVITY OF KWAO KRUA PLANTS USING YEAST ESTROGEN SCREEN (YES) METHOD

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ABSTRACT

Thai indigenous phytoestrogen rich plants, namely White (Pueraria mirifica), Red (Butea superba) and Black (Mucuna colletti) Kwao Krua, are currently of interest for use as alternative sources in estrogen replacement therapy (ERT) in menopausal women. The objectives of this study were to evaluate estrogenic activity of 3 types of Kwao Krua plant from different sources in Thailand and their different estrogenic and antiestrogenic effects on the human estrogen receptors hERα and hERβ by using a yeast estrogen screening (YES) method.

The YES-hERα/hTIF2 (YES-hERβ) and YES-hERβ/hSRC1 (YES-hERβ) systems based on yeast two-hybrid system were employed in this study. These systems contain hERα/β-ligand binding domain and hTIF2/hSRC1 coactivators. They were verified as sensitive to 17β-estradiol (E2), phytoestrogen (daidzein, genistein and puerarin) and crude extract of Pueraria lobota, a well-known phytoestrogen rich plant. Furthermore, antiestrogenic activity was evaluated by both systems. The parameters for evaluation of the estrogenic activity of Kwao Krua extract were the relative potency and relative inductive efficiency (RIE) as compared to the estrogenic activity of E2. It was demonstrated that the estrogenic activity of all Kwao Krua plant extracts evaluated by YES-hERβ was stronger than that by YES-hERα. In addition, P. mirifica and B. superba plant samples collected from the north and northeast regions, respectively, exhibited higher estrogenic activity than those from other regions by both YES systems. Both plant extracts also exerted antiestrogenic activity which was more potent in YES-hERβ than in YES-hERα. Moreover, the enhancement of estrogenic activity of both plant extracts after treatment with S-9 mix would seems to require metabolic activation in the body. Of the Kwao Krua plants tested, B. superba plant extract exhibited the highest estrogenic potency. This study could provide useful information in selection of potential Kwao Krua plant source for further development of novel health products.

KEYWORDS: S. CEREVISIAE/ YEAST ESTROGEN SCREEN/ ESTROGEN RECEPTORS/ PHYTOESTROGENS/ KWAO KRUA PLANT

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