

**In vitro screening test of Holy Basil and Other 3
Thai Vegetable Alcoholic Extracts on Rat
CYP3A4 Enzyme Activity**

Siraporn Sitthiram¹, Chanitsara Booncharoen¹, Pitikarn Cheabkor¹,
Suttasinee Suwannakul¹, Benjabhorn Sethabouppha^{1*}

Introduction: Vegetable has always been a part of almost every Thai dish. Since vegetable may affect on Cytochrome P450 enzyme function, food-drug interaction can possibly occur when having vegetable with certain medications. CYP3A4 is a member of cytochrome P450 enzyme taking part in metabolism of drugs such as anticancers, immunosuppressive agents and macrolides antibiotics. *Ocimum sanctum* L. (Holy basil or Ka Prao), *Coccinia grandis* (ivy gourd or Tam Leung), *Tiliacora triandra* (bamboo grass or Ya Nang) and *Sauvagesia androgynus* (star gooseberry or Pak Wan Ban) are Thai vegetables generally found in the northeastern part of Thailand. Risk determination of these vegetables to cause interaction with CYP3A4-mediated drug metabolism should be investigated for patient safety and best treatment outcome. The objective of this study was to test the effects of those 4 Thai vegetable crude alcoholic extracts on function of rat CYP3A4 enzyme in vitro. **Materials and Method:** Metabolic tests were duplicated carried out in vitro using rat liver microsome. Testosterone was used as a specific CYP3A4 probe substrate whereas positive control used was ketoconazole. The amount of 6 β -hydroxytestosterone, a metabolite of testosterone, obtained from CYP3A4-catalyzing metabolic reaction in the presence of the crude vegetable alcoholic extracts was detected by using High Performance Liquid Chromatography (HPLC) technique followed by comparing to 6 β -hydroxytestosterone detected from reaction without vegetable alcoholic extracts. **Results:** It was found that the alcoholic extracts of bamboo grass, star gooseberry, ivy gourd and holy basil affected on CYP3A4 enzyme function in wide range of inhibition (1.05, 7.56, 8.71, and 57.91 % inhibition respectively). **Conclusion:** It could be concluded that all 4 Thai vegetables inhibit CYP3A4 function in different degree. The same test using aqueous and hexane extracts of these vegetables should be done in the future.

Keywords: CYP3A4, Cytochrome P450, Herb-drug interaction, Thai Vegetable, *In Vitro*

¹Faculty of Pharmaceutical Sciences, Ubon Ratchathani University

* Corresponding author: Faculty of Pharmaceutical Sciences, Ubon Ratchathani University, Ubon Ratchathani, 34190, Thailand. Tel/Fax 66-45-288382

e-mail: benjaseth@gmail.com , phbenjse@mail2.ubu.ac.th

**Screening Test of 5 Thai Vegetable Alcohol Extracts
on Rat CYP2D6 Enzyme Activity *in-vitro*.**

Duangjai Janpirak¹, Sasitorn Leeprakon¹, Suttasinee Suwannakul¹, Benjabhorn Sethabouppha^{1*}

Introduction: Metabolism-based herbal-drug interaction now becomes high interested issue especially in tropical countries with variety of plants. CYP2D6 is a member of cytochrome P450 enzyme involved in biotransformation of many drugs such as antipsychotic drugs and opioids. Holy basil or Ka Prao (*Ocimum sanctum* L.), ivy gourd or Tam Leung (*Coccinia grandis*), Indian mulberry leaf or Bai Yoe (*Morinda citrifolia*), bamboo grass or Ya Nang (*Tiliacora triandra*) and star gooseberry or Pak Wan Ban (*Sauvagesia androgynus*) are Thai vegetables widely consumed in Thai North Eastern area. Chance of these vegetables to cause interaction with CYP2D6-mediated drugs metabolism should be investigated for patient safety and drug efficacy. The objective of this study was to preliminary test the effect of those 5 Thai vegetable crude alcohol extracts on function of rat CYP2D6 enzyme in vitro. **Materials and Method:** Metabolic tests were carried out in vitro using rat liver microsome. Dextromethorphan was used as a specific CYP2D6 probe substrate whereas positive control used was cimetidine. The amount of Dextrophan, major metabolite of Dextromethorphan, obtained from each metabolic reaction with individual crude alcohol extracts was determined by using High Performance Liquid Chromatography (HPLC). Then, the percentage of inhibition was calculated. **Results:** It was found that the alcohol extract of holy basil, bamboo grass, ivy gourd, star gooseberry and Indian mulberry affected on CYP2D6 enzyme function in different degrees of inhibition ranking from low to high (4.86, 5.48, 11.74, 22.46 and 65.65 % inhibition respectively). **Conclusion:** It could be conclude that all 5 Thai vegetables inhibit CYP2D6 function in different degrees. The aqueous and hexane extracts of these herbs should be further investigated.

Keywords: CYP2D6, Cytochrome P450, Herb-drug interaction, Thai Vegetable, *In Vitro*

¹Faculty of Pharmaceutical Sciences, Ubon Ratchathani University

* Corresponding author: Faculty of Pharmaceutical Sciences, Ubon Ratchathani University, Ubon Ratchathani, 34190, Thailand. Tel/Fax 66-45-288382

e-mail: benjaseth@gmail.com , phbenjse@mail2.ubu.ac.th