

เอสโตรเจนิกแอกติวิตีเชิงปริมาณของกวาวเครือขาว *Pueraria mirifica*
จากแหล่งต่างๆในประเทศไทยในหนูตัวรับไข



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QUANTITATIVE ESTROGENIC ACTIVITY OF WHITE KWAO KRUA *Pueraria
mirifica* FROM VARIOUS PARTS OF THAILAND IN OVARECTOMIZED RATS



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ศึกษาเอสโตรเจนิกแอกติวิตีของกวาวเครือขาวที่เก็บจากแหล่งต่างๆ ทั่วประเทศไทยจำนวน 25 จังหวัดในหนูแรพเพศเมียตัดรังไข่ให้สารแขวนลอยกวาวเครือขาวขนาด 10, 100, 1,000 มก./กก.นน. ตัว/วัน ในน้ำกลั่น 0.7 มล. เปรียบเทียบกับกลุ่มที่ป้อนน้ำกลั่น 0.7มล./วัน และกลุ่มที่ฉีด 17β -estradiol การทดลองแบ่งเป็น 3 ระยะเวลาคือระยะก่อนการทดลอง ระยะทดลอง และระยะหลังการทดลอง ระยะละ 14 วัน และใช้การเปลี่ยนแปลงของเซลล์ที่ผนังช่องคลอดโดยการทำ vaginal smear เป็นดัชนีบ่งชี้ พบว่าวันแรกที่มีการเกิด cornified cell หลังจากให้กวาวเครือขาวขนาด 100 มก./กก./วัน และช่วงระยะเวลาการเกิด cornified cell เมื่อให้กวาวเครือขาวขนาด 1,000 มก./กก./วัน สามารถนำมาใช้เป็นดัชนีในการจำแนกเอสโตรเจนิกแอกติวิตีของกวาวเครือขาวได้ จากผลการทดลองพบว่า กวาวเครือขาวแสดงฤทธิ์เอสโตรเจนิกตามขนาดที่ให้นั้นคือ กวาวเครือขาวในขนาด 10 มก./กก./วัน ไม่ทำให้เกิดการเปลี่ยนแปลงของเซลล์ที่ผนังช่องคลอด ในขณะที่ กวาวเครือขาวในขนาด 1,000 มก./กก./วัน สามารถกระตุ้นการเจริญของเซลล์ที่ผนังช่องคลอดได้เร็วและนานกว่าขนาด 100 มก./กก./วัน และการเจริญของเซลล์ผนังช่องคลอดสัมพันธ์กับการเพิ่มขึ้นของน้ำหนักมดลูก กวาวเครือขาวจากจังหวัดกาญจนบุรีกระตุ้นการเจริญของเซลล์ที่ผนังช่องคลอดได้เร็วกว่าในเวลาที่ 4 วัน หลังให้กวาวเครือขาวขนาด 100มก./กก./วัน และคงฤทธิ์อยู่ได้นานกว่าสายพันธุ์อื่นนาน 18 วัน และฤทธิ์ดังกล่าว หลังให้กวาวเครือขาวในขนาด 1,000 มก./กก./วัน เทียบเท่ากับการให้ 17β -estradiol ขนาด 200ไมโครกรัม /100กรัม นน.ตัว/วัน และกวาวเครือขาวจากจังหวัดอุดรดิตถ์มีฤทธิ์ในเชิงเอสโตรเจนิกต่ำสุด สามารถกระตุ้นการเจริญของเซลล์ที่ผนังช่องคลอดได้ในวันที่ 8 หลังให้กวาวเครือขาวขนาด1,000 มก./กก./วัน และคงฤทธิ์อยู่ได้นานประมาณ 9 วัน และเมื่อดูในภาพรวมแล้ว กวาวเครือขาวจากภาคกลางสามารถแสดงฤทธิ์ในเชิงเอสโตรเจนิกได้สูงที่สุด เมื่อเปรียบเทียบอัตราการเจริญของหนูในแต่ละกลุ่ม พบว่า กลุ่มควบคุมมีน้ำหนักตัวเพิ่มขึ้นอย่างมีนัยสำคัญทางสถิติตลอดการทดลอง ขณะที่กลุ่มทดลองที่ได้รับกวาวเครือขาวน้ำหนักตัวจะลดลงตามขนาดของกวาวเครือที่ให้ ในการตรวจสอบทางจุลกายวิภาคศาสตร์ของตับหนูที่ได้รับกวาวเครือขาวจากจังหวัดกาญจนบุรีในขนาด1000 มก./กก./วัน ไม่พบความผิดปกติ อาจกล่าวได้ว่ากวาวเครือขาวทั้ง 25 สายพันธุ์ที่ใช้ในการทดลองนี้ไม่มีความเป็นพิษ งานวิจัยนี้สามารถเป็นแนวทางชี้้นำในการคัดเลือกวัตถุดิบที่มีคุณภาพดีของกวาวเครือขาวเพื่อใช้ในอุตสาหกรรมด้านต่างๆต่อไป

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YOSAPORN KITSAMAI: QUANTITATIVE ESTROGENIC ACTIVITY OF WHITE KWAO
KRU A *Pueraria mirifica* FROM VARIOUS PART OF THAILAND IN OVARIECTOMIZED
RATS, THESIS ADVISOR: ASSOC. PROF. WICHAI CHERDSHEWASART, D.Sc., THESIS
COADVISOR: ASSOC. PROF. SUCHINDA MALAIVICHITNOND. Ph.D,135pp.

To quantify the estrogenic activity of White Kwao Krua (WKK: *Pueraria mirifica*) collected from 25 provinces throughout Thailand, the vaginal cytology assay in ovariectomized rats was used as an indicator. Rats were fed with WKK at the doses of 10, 100, 1,000 mg/kgBW/day suspended in 0.7 ml of distilled water, and compared to rats fed with 0.7 ml distilled water only and injected with a single dose of 17β - estradiol. The treatment schedule was separated into 3 periods; pre-treatment, treatment and post-treatment. The duration for each period was 14 days. From this study, it was found that the first day of appearance of cornified cells after 100 mg/kgBW/day of WKK treatment and the durations of occurrence of cornified cell during 1,000 mg/kgBW/day of WKK treatment could be used as an indicator to rank the estrogenic activity of WKK. The estrogenic activity of WKK was a dose dependent. WKK at 10 mg/kgBW/day could not stimulate the vaginal cell and the vaginal cornification in rats treated with 1,000 mg/kgBW/day of WKK was occurred faster and longer than that of rats treated with 100 mg/kgBW/day. Changes of vaginal cells after WKK treatment were agreed with the increase of uterus weight. It was found that WKK collected from Kanchanaburi was the most potent in term of induction of vaginal cornification. The proliferation of vaginal epithelium was faster (4 days after 100 mg/kgBW/day of WKK treatment) and longest (for 18 days during 1,000 mg/kgBW/day of WKK treatment). The estrogenic activity of WKK collected from Kanchanaburi at dosage of 1,000 mg/kgBW/day was equated to that of 17β - estradiol at the dose of 200 μ g /100gBW/day. When the estrogenic activity was related to the regions, WKK collected from the central part showed the highest estrogenic activity. The body weight of rats in the control group was significantly increased throughout the study period, however, the body weight gain was decreased in rats fed with WKK, in a dose-dependent manner. The histological examination of rats liver treated with 1,000 mg/kgBW/day of WKK showed no signs of abnormality, it may conclude that WKK collected from the 25 provinces has considerably safe for human use. This study should be a practical guide to search for plant materials or set up a plantation of *P. mirifica* with high estrogenic activity to serve the market demand.

Student's signature.....Yosaporn Kitsamai.....
Field of study.....Biotechnology..... Advisor's signature.....Wichai Cherdshewasart.....
Academic year.....2004..... Co- advisor's signature.....Suchinda Malaivichitnond.....

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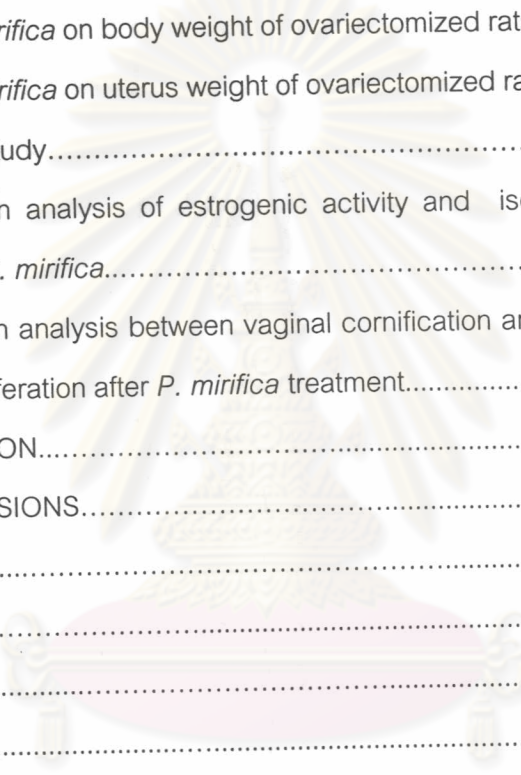
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ABBREVIATIONS

BW	Body weight
Co	Cornified cell
DW	Distilled water
Day	Day of study period
D	Day of treatment period
D'	Day of posttreatment
E ₂	17 β -estradiol
FSH	Follicle stimulating hormone
g	Gram
kg	Kilogram
l	Litre
L	Leucocyte cell
LH	Lutinizing hormone
M	Molar
mg	Milligram
ml	Millilitre
O	Nucleated cell
OVX	Ovariectomy
PM	<i>Pueraria mirifica</i>
μ g	Microgram
μ l	Microlitre
°C	Degree Celcius

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