

ABSTRACT

The present study was carried out to investigate the biological activities of Curcuma xanthorrhiza (ขมิ้นชัน) on the function of female reproductive system in rat. C. xanthorrhiza was extracted with different solvents. Four extracted components consisting of hexane, ethyl acetate, butanol and aqueous extracts, respectively, were obtained. Uterotrophic activities of various extracts of C. xanthorrhiza were investigated in bilaterally ovariectomized - immature rats. With respect to the increase uterine weight and glycogen content, the hexane extract was the most effective in inducing uterotrophic activity whereas the ethyl acetate and the butanol extracts possessed a weak uterotrophic activity and the aqueous extract had no activity. The uterotrophic activity of the hexane extract was further explored and compared to that of estradiol. The extract showed a dose dependent increase in both uterine weight and glycogen content similar to those of estradiol. The maximal dose of the hexane extract (480 mg/kg) appears to have quantitative the same effect as 10 µg/kg estradiol.

Cytological and histological examination of the vaginal and uterine mucosae indicated that the hexane extract certainly contained estrogenic activity. It had ability to induce cornification of vaginal epithelial cells, to promote growth and to induce keratinization of vaginal mucosa. It also caused a hypertrophy of uterine mucosa.

Time course of the effects of hexane extract on the increase in uterine weight and biochemical changes including DNA,

protein and glycogen contents were found to be similar to those of estradiol. These biochemicals were progressively increased with time and peaked at 24 h after administration. However, after the peak, the biochemical substances in the uterus of the normal treated with hexane extract declined to the control level by 48 h whereas those in the estradiol treated animals remained elevated at the peak level. This indicates a shorter action of the hexane extract.

To characterize the estrogenic action of the hexane extract, its effect in modifying the uterine response to estradiol was evaluated. The hexane extract enhanced the uterine response to estradiol in all cases whenever it was given prior to, simultaneously or after estradiol administration. As no inhibitory effect was observed with varying schedule of administration, the hexane extract was suggested to be a purely estrogen agonist. In addition, the hexane extract had ability to induce specific estradiol binding site in the nucleus although it was less efficient than the estradiol.

Therefore, it was suggested that the hexane extract of C. xanthorrhiza possessed a weak estrogenic activity and mediated its uterotrophic action through specific estradiol binding receptor in the cell. To our knowledge, this is the first report of the presence of phytoestrogen in C. xanthorrhiza. This finding will be a scientific evidence supporting the folkloric use of this drug as emmenagogue.