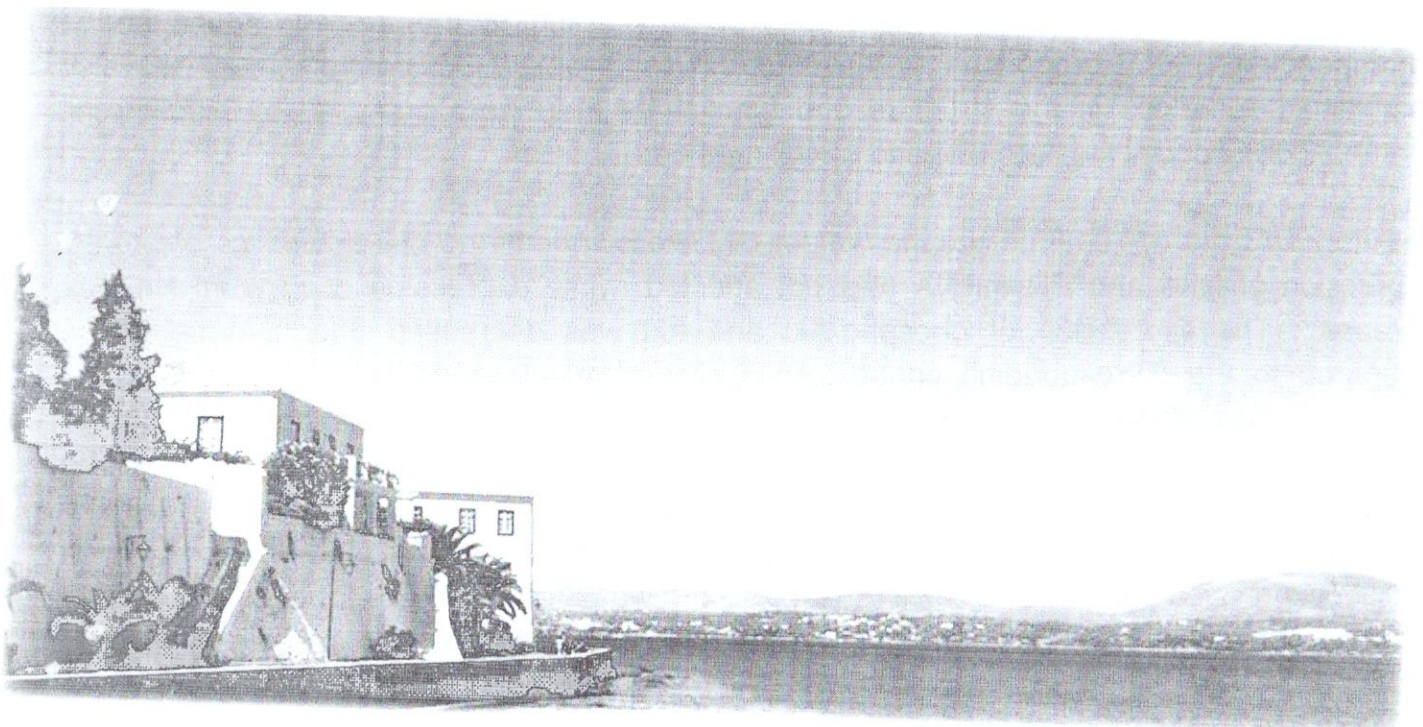


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Soy phytoestrogen daidzein affects ER β and Akt expression in middle aged rat uterus

Ivana Jarić, Jasmina Živanović, Marko Miler, Vladimir Ajdžanović, Svetlana Trifunović, Verica Milošević, Nataša Nestorović

Department of Cytology, Institute for Biological Research "Siniša Stanković", University of Belgrade, Despot Stefan Blvd. 142, 11060 Belgrade, Serbia. e-mail: ivana84@ibiss.bg.ac.rs

Background and study objective: Soy phytoestrogen daidzein (DAI) is bioactive food ingredient of the traditional East Asian diet and currently discussed as alternative to classical hormone replacement therapies and for reducing the prevalence of hormonedependent cancers. However, there is still a lack of information on the potential risks of their usage, particularly if we keep in mind the fact that phytoestrogens also may act as endocrine disruptors. In order to obtain further data useful for estimation of the safety profile of DAI, we investigated potential of DAI for improvement of uteri function and compared these effects with the effects of estradiol-dipropionate (EDP), commonly used in prevention and treatment of menopausal symptoms. Also, we investigated the expression of steroid receptor (ER α , ER β and PR) as well as Akt expression in uterus of middle aged female rats.

Methods: Middle-aged (13-months-old) female Wistar rats subcutaneously received 35 mg/kg of DAI or 0.625 mg/kg of EDP, daily for 4 weeks. Each of the treated groups had a corresponding control group due to the different dissolvent. Intact control group was also established. Changes in the structure and function of uteri were analyzed by histological, immunofluorescence, Western blot and qPCR methods.

Results: DAI did not change uterine weight or histomorphometric characteristics of uterus. Expression of ER α and PR mRNA was not affected, while expression of ER β mRNA was increased. The expression of phospho-Akt and Akt was decreased after DAI treatment, compared to the corresponding control group. These results suggest that decreased Akt expression and activity in response to DAI may be an important mechanism to protect endometrial cells from proliferation. In contrast, EDP treatment increased the absolute and relative uterine weights. This is the result of increase of endometrium, endometrial epithelium and endometrial glands. Also, EDP caused decrease of ER α mRNA and increase of PR mRNA expression, while ER β mRNA expression was not changed. The expression of phospho-Akt was decreased, whereas the expression of total Akt was increased compared to corresponding control group.

Conclusion: Compared to EDP, phytoestrogen DAI exhibited beneficial effects on the uterus of middle-aged female rats in the conducted study, rendering the compound with a more promising safety profile, therefore justifying further investigations into its efficacy to alleviate postmenopausal discomforts.