

Molecular and clinical role of phytoestrogens as anti-skin-ageing agents: A critical overview

Bancha Yingngam, Wandee Rungsevijitprapa*

Department of Pharmaceutical Chemistry and Technology, Faculty of Pharmaceutical Sciences, Ubon Ratchathani University, Ubon Ratchathani 34190, Thailand

*Corresponding Author: wandeeim@yahoo.com; Tel.: +66 45 353615; Fax. +66 45 353626

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Abstract

Accumulated evidence from epidemiological, clinical, and laboratory studies have supported the important role of estrogens on skin physiology. Estrogen therapy has been demonstrated as a therapy for the signs of ageing related to estrogen deficiency in menopausal women. Unlike cosmetic products, estrogens cannot be used as therapy for skin-ageing in all women due to their potencies and ability to produce undesirable side-effects. Therefore, the use of phytoestrogens as natural product remedies to alleviate skin-ageing is more common. Current literature suggests that phytoestrogens offer improvement and delay signs of skin-ageing similar to the effects of estrogens. Moreover, the lack of side-effects when using phytoestrogens points towards their safety. This review article summarizes the evidence for the potential use of phytoestrogens as an alternative method for the alleviation or prevention of the signs of skin-ageing related to estrogen loss after menopause. The classification, mechanism of action, and pharmacology by which phytoestrogens can cause changes in skin-ageing are also discussed. Additionally, gaps in information about phytoestrogens and the most promising future research are mentioned.

Keywords: Phytoestrogens; Ageing; Skin; Molecular mechanism; Benefits; Risks

Introduction

Skin is the most superficial part of the human body. Like other organs, ageing of the skin affects its structural and functional properties, and the psychology of humans. Thus, the causes of ageing and appropriate treatment and preservation approaches have attracted the interest of the already aged, young people, and cosmetic researchers. Several theories of skin ageing have been proposed. Depletion of estrogen levels (estradiol, estriol, and estrone) in blood circulation was found to be one of the major factors that influence skin ageing (Polito et al., 2012; Pontius and Smith, 2011). In normal skin, estrogens exert their effects through estrogen receptors present in the skin (Hall and Phillips, 2005). Estrogens maintain skin moisture by preserving the acid mucopolysaccharide and the hyaluronic acid (Sobel et al., 1965).