

## OIL EXTRACTS OF WILD APPLE FRUIT AS SOURCE OF BIOACTIVE SUBSTANCES IN COSMETIC PRODUCTS FOR SKIN HYDRATION

**Dragana Stojiljković<sup>1\*</sup>, Ivana Nešić<sup>2</sup>, Vanja Tadić<sup>3</sup>**

<sup>1</sup>Pharmacy Institution "Dr.Max", Belgrade, Serbia

<sup>2</sup>University of Niš – Faculty of Medicine, Department of Pharmacy, Niš, Serbia

<sup>3</sup>Institute for Medicinal Plant Research „Dr. Josif Pančić“, Belgrade, Serbia

\*s.dragana1983@gmail.com

Wild apple fruit represents a good source of bioactive hydrating substances (polyphenols-PP and fruit acids-FA). Application of cosmetic products with oil extracts of wild apple fruit might show favorable hydrating effects. The aim of study was the preparation of oil extracts of wild apple fruit (*Malus sylvestris fructus* (L.) Mill., Rosaceae), originated from Serbia, preparation of cosmetic cream with oil extract, investigation of PP and FA content, and *in vivo* investigation of efficacy of cream containing oil extract after skin application. Liquid oil extracts were prepared in the drug:extract ratio 1:5 (m:m) with sunflower oil as solvent and maceration-EM and digestion-ED as extraction methods, while ED was incorporated into the cream o/w type, stabilized by biodegradable mixed emulsifiers. Content of PP and FA was determined by HPLC analysis. *In vivo* efficacy included investigation of skin hydration potential of the cream, transepidermal water loss-TEWL and skin pH after 14 and 28 days of cream application on healthy volunteers' skin. Content of identified bioactive substances was better in extract EM (PP content: 7000.71mg/100gED and 27.14mg/100gEM and FA content: 2618.76mg/100gED and 281.25mg/100gEM). *In vivo* study revealed an increase of skin hydration ( $\Delta EC$  was  $14.98 \pm 6.58$  after 14 days and  $10.12 \pm 5.86$  after 28 days), with unchanged TEWL and skin pH values. Obtained results indicate that oil extracts of wild apple fruit represent a valuable source of bioactive substances with good hydrating effects of the cream on human skin, so it might potential used in cosmetic products for skin hydration.

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## ULJANI EKSTRAKTI PLODA DIVLJE JABUKE KAO IZVOR BIOAKTIVNIH SUPSTANCI U KOZMETIČKIM PROIZVODIMA ZA HIDRATACIJU KOŽE

**Dragana Stojiljković<sup>1\*</sup>, Ivana Nešić<sup>2</sup>, Vanja Tadić<sup>3</sup>**

<sup>1</sup>Apotekarska Ustanova "Dr.Max", Beograd, Srbija

<sup>2</sup>Univerzitet u Nišu – Medicinski fakultet, Katedra Farmacija, Niš, Srbija

<sup>3</sup>Institut za proučavanje lekovitog bilja „Dr Josif Pančić“, Beograd, Srbija

\*s.dragana1983@gmail.com

Plod divlje jabuke predstavlja dobar izvor bioaktivnih hidratantnih supstanci (polifenoli-PF i voćne kiseline-VK). Primena kozmetičkih proizvoda sa uljanim ekstraktima ploda divlje jabuke može pokazati povoljne hidratacione efekte nakon primene na kožu. Cilj našeg rada bio je priprema uljanih ekstrakata ploda divlje jabuke (*Malus sylvestris fructus* (L.) Mill., Rosaceae), poreklom iz Srbije, izrada kozmetičkog krema sa uljanim ekstraktom, ispitivanje sadržaja PF i VK, kao i in vivo ispitivanje efikasnosti krema sa uljanim ekstraktom nakon primene na kožu. Tečni uljani ekstrakti su pripremljeni u droga:ekstrakt odnosu 1:5 (m:m) sa suncokretovim uljem kao ekstragensom i primenom maceracije (ekstrakt EM) i digestije (ekstrakt ED) kao ekstrakcionih metoda, dok je u krem u/v tipa inkorporiran ekstrakt ED i stabilizovan je biodegradabilnim mešanim emulgatorima. Sadržaj PF i VK je određen HPLC analizom, a in vivo efikasnost je podrazumevala ispitivanje hidratacionog potencijala krema, transepidermalnog gubitka vode (TEGV) i pH kože nakon 14 i 28 dana primene krema na koži zdravih dobrovoljaca. Sadržaj identifikovanih bioaktivnih supstanci je bio bolji u ekstrakt EM (sadržaj PF: 7000,71mg/100gED i 27,14mg/100gEM i sadržaj VK: 2618,76mg/100gED i 281,25mg/100gEM). In vivo ispitivanje je pokazalo povećanje hidratacije kože ( $\Delta EC$  je nakon 14 dana bio  $14,98 \pm 6,58$ , a nakon 28 dana  $10,12 \pm 5,86$ ) sa nepromenjenim vrednostima TEGV i pH kože. Dobijeni rezultati ukazuju da uljani ekstrakti ploda divlje jabuke predstavljaju značajan izvor bioaktivnih supstanci sa dobrim hidratacionim efektima krema na humanoj koži, pa se mogu potencijalno koristiti u kozmetičkim proizvodima namenjenim za hidrataciju kože.

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