

HEMIJSKI SASTAV I ANTIOKSIDATIVNA AKTIVNOST ETARSKOG ULJA I EKSTRAKATA KORENA ANGELIKE (*Angelica archangelica* L.)

Jelena Stanojević*, Nataša Simonović, Silvija Đorđević, Ljiljana Stanojević, Jelena Zvezdanović, Dragan Cvetković

Univerzitet u Nišu, Tehnološki fakultet, Leskovac, Srbija

*jstanojevic@tf.ni.ac.rs

Cilj ovog rada bio je poređenje hemijskog sastava i antioksidativne aktivnosti izolata (etarskog ulja, infuza, etanolnog i heksanskog ekstrakta) dobijenih iz osušenog korena angelike (*Angelicae radix; Angelica archangelica* L.). Biljni materijal je nabavljen od Instituta za proučavanje lekovitog bilja „Dr Josif Pančić“. Etarsko ulje je izolovano Clevenger hidrodestilacijom; infuz korena angelike pripremljen je prema uputstvu datom na pakovanju dok su etanolni i heksanski ekstrakt dobijeni Soxhlet ekstrakcijom. Kvalitativni i semi-kvantitativni sastav etarskog ulja određen je GC/MS metodom dok je hemijski sastav dobijenih ekstrakata određen UHPLC-DAD-ESI-MS metodom. Sadržaji ukupnih fenola i ukupnih flavonoida u ekstraktima određeni su metodom po Folin-Ciocalteu i metodom sa AlCl₃, respektivno, dok je antioksidativna aktivnost dobijenih izolata određena DPPH testom. Na osnovu rezultata GC/MS analize, najzastupljenija jedinjenja u etarskom ulju bile su masne kiseline sa palmitinskom (23,6%) i linolnom kiselinom (26,5%) kao predstavnicima i kumarini, sa ostolom (12,6%) kao dominantim jedinjenjem. UHPLC hromatografija ekstrakata korena angelike u pozitivnom jonizacionom modalitetu omogućila je identifikaciju kumarina (ostol) i furanokumarina (ksantoksin, bergapten, psoralen, angelicin). Vrednosti sadržaja ukupnih fenola i ukupnih flavonoida opadale su u nizu: etanolni ekstrakt > infuz > heksanski ekstrakt. Najbolju antioksidativnu aktivnost među izolatima pokazao je infuz korena angelike (EC₅₀ vrednost od 0,43 mg/cm³). Iako je sadržaj ukupnih fenola i ukupnih flavonoida najveći u etanolnom ekstraktu, zbog sadržaja kumarina i furanokumarina treba biti obazriv prilikom njegovog korišćenja. Na osnovu dobijenih rezultata, infuz korena angelike se preporučuje kao prirodna alternativa sintetskim antioksidansima za primenu u prehrambenoj, farmaceutskoj i kozmetičkoj industriji.

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CHEMICAL COMPOSITION AND ANTIOXIDANT ACTIVITY OF ANGELICA (*Angelica archangelica* L.) ROOT ESSENTIAL OIL AND EXTRACTS

Jelena Stanojević*, Nataša Simonović, Silvija Đorđević, Ljiljana Stanojević,
Jelena Zvezdanović, Dragan Cvetković

University of Niš, Faculty of Technology, Leskovac, Serbia

*jstanojevic@tf.ni.ac.rs

The present study aimed to compare the chemical composition and antioxidant activity of isolates (essential oil, tea infusion, ethanolic, and hexane extract) obtained from the dried angelica root (*Angelicae radix*; *Angelica archangelica* L.). The plant material was purchased from the Institute for Medicinal Plants Research "Dr. Josif Pancic". The essential oil was isolated by Clevenger hydrodistillation; the tea was prepared according to the instructions given on the package, while the ethanol and hexane extracts were obtained by Soxhlet extraction. The qualitative and semi-quantitative composition of the essential oil was determined by the GC/MS method, while the chemical composition of the obtained extracts was determined by the UHPLC-DAD-ESI-MS method. The contents of total phenols and total flavonoids in the extracts were determined by the Folin-Ciocalteu method and the $AlCl_3$ method, respectively, while the antioxidant activity of the obtained isolates was determined by the DPPH test. Based on the GC/MS results, the most abundant compounds in the essential oil were fatty acids with palmitic (23.6%) and linoleic acid (26.5%) as representatives and coumarins, with ostol (12.6%) as the dominant compound. UHPLC chromatography of angelica root extracts in positive ionization mode enabled the identification of coumarins (ostol) and furanocoumarins (xanthoxin, bergapten, psoralen, and angelicin). The values of total phenols and total flavonoids decreased in the order: ethanol extract > tea infusion > hexane extract. The tea infusion of angelica root showed the best antioxidant activity among the isolates (EC_{50} value of 0.43 mg/cm³). Although the content of total phenols and total flavonoids is the highest in the ethanol extract, due to the content of coumarins and furanocoumarins, care should be taken when using it. Based on the obtained results, angelica root tea infusion is recommended as a natural alternative to synthetic antioxidants for use in the food, pharmaceutical, and cosmetic industries.

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