

ANALIZA NAJVAŽNIJIH SEKUNDARNIH METABOLITA KORIJENA JAGORČEVINE

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Sažetak. Jagorčevina (*Primula veris* Huds.) je višegodišnja zeljasta biljka koja raste u zapadnoj i južnoj Evropi, sjeverozapadnoj Africi i dijelovima jugozapadne Azije. Ona spada u porodicu Primulaceae. Polovina svih vrsta iz ove porodice pripada rodu *Primula*. Jagorčevina je niska biljka koja raste u visinu do 20 cm i cvjeta tokom ranog proljeća. Ona ima važnu ulogu u fitoterapiji. U tradicionalnoj medicini korijen jagorčevine je korišten za razrjeđenje gustog bronhijalnog sekreta i olakšavanje iskašljavanja. Sekundarni metaboliti izolovani iz korijena jagorčevine imaju naglašen biološki i farmakološki potencijal. Za utvrđivanje terapijskog efekta potrebno je definisati sadržaj aktivnih jedinjenja i pratiti njihov sadržaj u ljekovitim proizvodima dobijenim iz korijena jagorčevine. Cilj ovog rada odnosi se na pregled trenutog stanja znanja o analitičkim metodama za detekciju i određivanje sadržaja sekundarnih metabolita dobijenih iz korijena jagorčevine. Ovaj pregled pruža detaljnu analizu trenutne primjene savremenih metoda u identifikaciji i određivanju sekundarnih metabolita korijena jagorčevine, a na osnovu podataka prikupljenih iz recenziranih radova refereisanih u bazama Science Direct, Scopus, Medline i Google Scholar. Pretraživanje je izvršeno na osnovu sljedećih ključnih riječi: „Primrose (*Primula veris*)”, „Flavonoids”, „Primrose (*Primula veris*) and Flavonoids”, „Phytomedicine”, „*Primula veris* and Phytomedicine”, „*Primula veris* and Flavonoids and Phytomedicine”. U analiziranim radovima kao jedinjenja sa najizraženijim fiziološkim djelovanjem navedeni su: triterpenski saponini i fenolna jedinjenja, uključujući flavonoide, fenolne kiseline i fenolne glikozide. Za identifikaciju i utvrđivanje sadržaja ovih jedinjenja u radovima su korištene različite analitičke metode: spektrofotometrijske metode (procjena kapaciteta antioksidativne aktivnosti pomoću DPPH, CUPRAC test, FRAP test), tankoslojna hromatografija, tečna hromatografija visokih preformansi (HPLC), detekcija evaporativnog raspršenja svjetlosti, masena spektrometrija (GC/MS), Fourier-transformska infracrvena spektroskopija (FTIR), nuklearna magnetna rezonancija (NMR). Najzastupljenija korištena metoda bila je HPLC. U ovom preglednom radu naglašena je važnost sekundarnih metabolita i drugih aktivnih komponenti iz korijena jagorčevine, te potreba za primjenom adekvatnih analitičkih metoda za brzu identifikaciju i tačno određivanje pojedinih sastojaka. Pored toga, prikazani su uslovi tokom određivanja sadržaja triterpenskih saponina i fenolnih jedinjenja. Rezultati prikazani u ovom radu služe kao važan izvor informacija za stručnjake u laboratorijama, farmaceutske i medicinske stručnjake.

Ključne riječi: primula, saponini, flavonoidi, tečna hromatografija visokih performansi

ANALYSIS OF THE MOST IMPORTANT SECONDARY METABOLITES OF PRIMROSE ROOTS

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Abstract. Primrose (*Primula veris* Huds.) is a perennial herbaceous plant which grows in Western and Southern Europe, Northwestern Africa, and most of Southwestern Asia. It belongs to the Primulaceae family. Half of all species from this family belong to the genus *Primula*. Primrose is a low plant that grows up to 20 cm in height and flowers during early spring. It has an important role in phytotherapy. In traditional medicine, primrose root is used to thin thick bronchial secretions and to facilitate expectoration. The secondary metabolites isolated from the roots of primrose have a pronounced biological and pharmacological potential. In order to determine the therapeutic effect, it is necessary to define the content of active compounds and monitor their content in the medicinal products obtained from the root of primrose. The aim of this paper is to review the current state of knowledge about analytical methods for the detection and determination of the content of secondary metabolites obtained from the roots of primrose. This review provides a detailed analysis of the current application of modern methods in the identification and determination of secondary metabolites of primrose root, based on data collected from peer-reviewed papers referenced in Science Direct, Scopus, Medline and Google Scholar databases. The search was performed based on the following keywords: " Primrose (*Primula veris*)", "Flavonoids", " Primrose (*Primula veris*) and Flavonoids", "Phytomedicine", "Primula veris and Phytomedicine", "Primula veris and Flavonoids and Phytomedicine". In the analyzed papers, the compounds with the most pronounced physiological effects were listed as: triterpene saponins and phenolic compounds, including flavonoids, phenolic acids and phenolic glycosides. Various analytical methods were used in the works to identify and determine the content of these compounds: spectrophotometric methods (estimation of antioxidant capacity using DPPH, CUPRAC test, FRAP test), thin-layer chromatography, high-performance liquid chromatography (HPLC), detection of evaporative light scattering, mass spectrometry (GC/MS), Fourier-transform infrared spectroscopy (FTIR), nuclear magnetic resonance (NMR). The most common method used was HPLC. In this review paper, the importance of secondary metabolites and other active components from the root of primrose is emphasized, as well as the need to apply adequate analytical methods for quick identification and accurate determination of individual ingredients. In addition, the conditions during the determination of the content of triterpene saponins and phenolic compounds are presented. The results presented in this paper serve as an important source of information for laboratory, pharmaceutical and medical professionals.

Key words: primula, saponins, flavonoids, high-performance liquid chromatography