

**COMPARATIVE QUANTITATIVE ANALYSIS OF ACTIVE SUBSTANCES IN BLACK  
CHOKEBERRY PRODUCTS AVAILABLE ON LOCAL MARKET**

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In recent decades, black chokeberry (*Aronia melanocarpa* (Michx.) Elliot) and products derived from its fruit (berries) have increasing popularity and wide applications. On the global and domestic market, chokeberry products are available in the forms of cold-pressed juice, herbal teas, tinctures, as well as food or dietary supplements. A large number of studies have been published in the scientific literature, studying chemical composition, mechanism of action, pharmacological activity and safety of active ingredient. Possibilities for the use of chokeberry pharmaceuticals in diseases and conditions related to oxidative stress are being intensively investigated. It has been proven that polyphenolic compounds are responsible for biological activity: anthocyanins, proanthocyanidins and phenolic acids. There are no official monographs published in modern world pharmacopoeias for herbal drugs and herbal preparations, therefore no standards regarding their qualitative and quantitative composition have been established. The aim of this study was to quantify active ingredients in chokeberry products available in the local pharmacies. The study covered five commercially available products, which the producers declared as 100% organic, mother, or cold-squeezed chokeberry fruit juice. The content of anthocyanins and flavonoids in these products was determined using specific, selective HPLC-UV methods. Other quality parameters: relative density, pH, dry residue, total polyphenols, residual solvents (ethanol), were also included in this examination. The results showed that the quantitative composition of the active compounds in chokeberry products can vary significantly. For example, the content of cyanidin-3-galactoside, as the most represented anthocyanin, ranged from 0.15 g/l to 5.5 g/l.

## UPOREDNA ANALIZA KVANTITATIVNOG SASTAVA FARMAKOLOŠKI AKTIVNIH JEDINJENJA U PROIZVODIMA PLODA ARONIJE PRISUTNIM NA DOMAĆEM TRŽIŠTU

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Crna aronija (*Aronia melanocarpa* (Michx.) Elliot) i proizvodi dobijeni iz njenog ploda (bobice) poslednjih decenija imaju veliku popularnost i široku primenu, u svetu i kod nas. Na tržištu su prisutni proizvodi u obliku soka (hladno ceđeni), tinktura i biljnih čajeva, uglavnom u kategoriji hrane i dijetetskih suplemenata. U naučnoj literaturi objavljen je veliki broj studija u kojima je ispitan hemijski sastav, mehanizam delovanja aktivnih sastojaka, farmakološka aktivnost i bezbednost primene. Intenzivno se istražuju mogućnosti za primenu farmaceutskih proizvoda na bazi aronije u bolestima i stanjima vezanim za oksidativni stres. Dokazano je da su za biološku aktivnost odgovorna polifenolna jedinjenja: antocijani, proantocijanidini i fenolne kiseline. Za biljnu drogu i preparate ploda aronije, nema zvaničnih monografija objavljenih u savremenim svetskim farmakopejama, odnosno nisu ustanovljeni standardi u pogledu njihovog kvalitativnog i kvantitativnog sastava. U ovom radu prikazani su rezultati ispitivanja sadržaja aktivnih sastojaka u proizvodima aronije dostupnim na domaćem tržištu. Istraživanjem je obuhvaćeno pet komercijalno dostupnih proizvoda, koje su proizvođači deklarirali kao 100 % organski, matični ili hladno ceđeni voćni sok. U njima je određen sadržaj antocijana i flavonoida primenom specifičnih, selektivnih HPLC-UV metoda. Ispitivanjem su obuhvaćeni i drugi parametri kvaliteta: pH, relativna gustina, suvi ostatak, sadržaj ukupnih polifenola, rezidualni rastvarači (etanol). Rezultati su pokazali da se kvantitativni sastav aktivnih jedinjenja u proizvodima od ploda aronije, može značajno razlikovati. Na primer sadržaj cijanidin-3-galaktozida, kao najviše zastupljenog antocijana, kretao se od 0,15 g/l do 5,5 g/l.