

CHEMICAL COMPOSITION AND ANTIMICROBIAL ACTIVITY OF ESSENTIAL OILS OF *PRANGOS TRIFIDA* S.L.

**Ljuboš Ušjak^{1*}, Dejan Stojković², Marina Soković², Marjan Niketić^{3,4},
Silvana Petrović¹**

¹University of Belgrade – Faculty of Pharmacy, Department of Pharmacognosy,
Belgrade, Serbia

²University of Belgrade, Institute for Biological Research “Siniša Stanković”,
Belgrade, Serbia

³Natural History Museum, Belgrade, Serbia

⁴Serbian Academy of Sciences and Arts, Belgrade, Serbia

*ljubos.usjak@pharmacy.bg.ac.rs

In this study composition and antimicrobial activity of essential oils of roots, leaves, stems and fruits of *Prangos trifida* (Mill.) Herrnst. & Heyn s.l. (Apiaceae) were investigated. Plant material was collected in Sićevo Gorge (Kusača) in 2020. Essential oils were isolated by hydrodistillation in Clevenger-type apparatus and analyzed by GC-FID-MS. Antimicrobial activity was tested by microdilution method against food contaminants: Gram-positive (*Staphylococcus aureus*, *Bacillus cereus* and *Listeria monocytogenes*), Gram-negative bacteria (*Escherichia coli*, *Enterobacter cloacae* and *Salmonella Typhimurium*), and molds (*Aspergillus fumigatus*, *A. niger*, *A. versicolor*, *Penicillium funiculosum*, *P. verrucosum* var. *cyclopium* and *Trichoderma harzianum*); artificial food preservatives E211 and E224 were used as controls. Dominant constituents of essential oils were monoterpenes (66.2-87.2%). Terpinolene (36.2%) and p-cymene (11.5%) prevailed in root oil, (E)- β -ocimen (23.2%) and terpinolene (18.1%) in leaf oil, p-cimen-8-ol (21.8%) and p-cimen (14.1%) in stem oil, and p-cimen (25.4%) and limonene (14.4%) in fruit oil. Essential oils showed significant antifungal activity (MIC=0.10-0.78 mg/mL; MFC=0.20-1.56 mg/mL), better compared to both tested commercial preservatives, and interesting antibacterial activity (MIC=0.20-6.25 mg/mL; MBC=0.39-12.5 mg/mL), which was in the case of root and stem oils better than activity of both preservatives against *S. aureus* and *B. cereus*. It should be noted that composition of tested oils was in accordance with composition of the oils of this plant from vicinity of Madrid (1) and from Crimea (2), while their antimicrobial activity was tested in this work for the first time. Obtained results justify further research of *P. trifida* essential oils as new natural food preservatives.

References

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HEMIJSKI SASTAV I ANTIMIKROBNA AKTIVNOST ETARSKIH ULJA *PRANGOS TRIFIDA* S.L.

**Ljuboš Ušjak^{1*}, Dejan Stojković², Marina Soković², Marjan Niketić^{3,4},
Silvana Petrović¹**

¹Univerzitet u Beogradu – Farmaceutski fakultet, Katedra za farmakognoziju,
Beograd, Srbija

²Univerzitet u Beogradu, Institut za biološka istraživanja „Siniša Stanković“,
Beograd, Srbija

³Prirodnjački muzej, Beograd, Srbija

⁴Srpska akademija nauka i umetnosti, Beograd, Srbija

*ljubos.usjak@pharmacy.bg.ac.rs

Cilj ovog rada bio je da se ispituju hemijski sastav i antimikrobna aktivnost etarskih ulja korena, listova, stabljika i plodova *Prangos trifida* (Mill.) Herrnst. & Heyn s.l. (Apiaceae). Biljni materijal je prikupljen na području Sićevečke klisure (Kusača) 2020. god. Etarska ulja su dobijena destilacijom vodenom parom u aparaturi po Klevendžeru i analizirana metodom GC-FID-MS. Antimikrobna aktivnost testirana je mikrodilucionom metodom na kontaminantima hrane: Gram-pozitivnim (*Staphylococcus aureus*, *Bacillus cereus* i *Listeria monocytogenes*), Gram-negativnim bakterijama (*Escherichia coli*, *Enterobacter cloacae* i *Salmonella Typhimurium*), i plesnima (*Aspergillus fumigatus*, *A. niger*, *A. versicolor*, *Penicillium funiculosum*, *P. verrucosum* var. *cyclopium* i *Trichoderma harzianum*); kao kontrole korišćeni su sintetski konzervansi E211 i E224. Dominantni sastojci etarskih ulja bili su monoterpeni (66,2-87,2%). Najzastupljeniji u ulju korena bili su terpinolen (36,2%) i *p*-cimen (11,5%), u ulju listova (*E*)- β -ocimen (23,2%) i terpinolen (18,1%), u ulju stabljika *p*-cimen-8-ol (21,8%) i *p*-cimen (14,1%), a u ulju plodova *p*-cimen (25,4%) i limonen (14,4%). Etarska ulja su pokazala značajnu antifungalnu aktivnost (MIK=0,10-0,78 mg/mL; MFK=0,20-1,56 mg/mL), bolju u poređenju sa oba testirana komercijalna konzervansa, i interesantnu antibakterijsku aktivnost (MIK=0,20-6,25 mg/mL; MBK=0,39-12,5 mg/mL), koja je u slučaju ulja korena i stabljika prema *S. aureus* i *B. cereus* bila bolja u odnosu na oba konzervansa. Treba istaći da je sastav ispitivanih etarskih ulja bio u skladu sa sastavom ulja ove biljke iz okoline Madrida (1) i sa Krima (2), dok je njihova antimikrobna aktivnost ispitivana u ovom radu po prvi put. Dobijeni rezultati predstavljaju dobru osnovu za dalja istraživanja etarskih ulja *P. trifida* kao novih prirodnih konzervanasa.

Literatura

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