



Univerzitet u Beogradu  
Farmaceutski fakultet  
University of Belgrade  
Faculty of Pharmacy



**SFUS**  
Savez farmaceutskih  
udruženja Srbije



Pokrovitelj Ministarstvo zdravlja  
Republike Srbije  
Under the auspices of the Ministry of Health  
Republic of Serbia

**VIII Kongres  
farmaceuta Srbije**  
sa međunarodnim učešćem

12–15. oktobar 2022. godine  
Beograd, hotel Crowne Plaza

**PRAVO VREME ZA  
PRAVO LICE FARMACIJE**

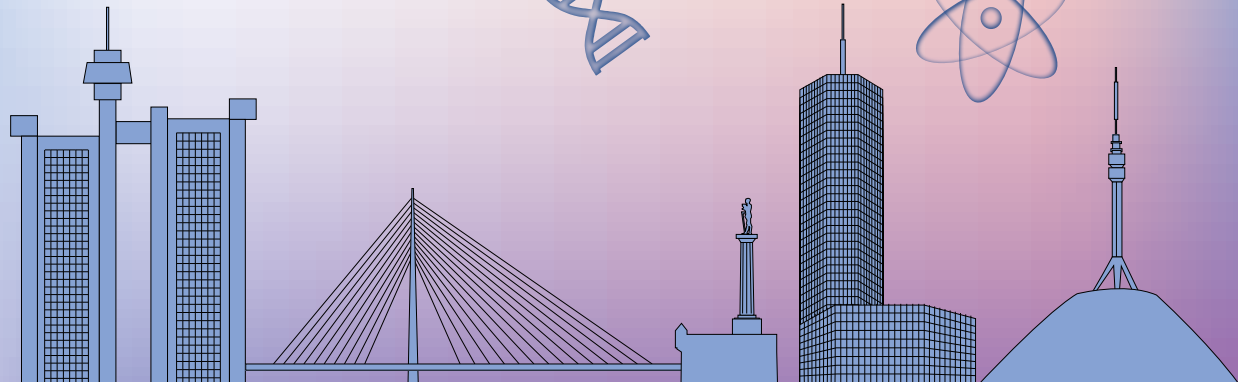
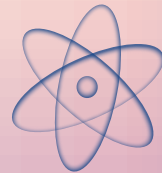
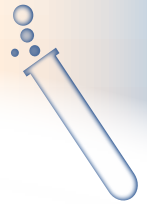
# PROGRAM

**VIII Serbian Congress  
of Pharmacy**  
with international participation

October 12-15, 2022  
Belgrade, Hotel Crowne Plaza

**THE RIGHT TIME FOR  
THE PHARMACY PULSE**

# PROGRAMME



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### **Savez farmaceutskih udruženja Srbije**

Bulevar vojvode Mišića 25, 11000 Beograd

Telefon: +381 11 26 48 385

Faks: +381 11 26 48 385

e-mail: kongres@sfus.rs • office@sfus.rs • info@sfus.rs

www.sfus.rs

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### **SMART TRAVEL PCO**

Njegoševa 72a, 11000 Beograd

Telefoni: +381 11 770 21 84, 770 25 22

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e-mail: smarttravelpco4@smarttravelpco4.rs

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**CHEMICAL COMPOSITION AND ANTIOXIDANT ACTIVITY OF NOBLE YARROW  
(*ACHILLEA NOBILIS* L. SUBSP. *NEILREICHII* (KERNER) VELEN.)**

**Katarina Radovanović<sup>1</sup>, Maja Hitl<sup>1</sup>, Biljana Božin<sup>1,2</sup>, Katarina Bijelić<sup>1</sup>,  
Blagoje Prpa<sup>1</sup>, Milica Aćimović<sup>3</sup>, Neda Gavarić<sup>1,2\*</sup>**

<sup>1</sup>University of Novi Sad – Faculty of Medicine, Department of Pharmacy, Novi Sad,  
Serbia

<sup>2</sup>Center for Medical and Pharmaceutical Investigations and Quality Control, Novi  
Sad, Serbia

<sup>3</sup>Institute of Field and Vegetable Crops, Novi Sad, Serbia

\*neda.gavaric@mf.uns.ac.rs

Species of the genus *Achillea* are well-known ancient medicinal plants. Noble yarrow is presented in eastern Serbia, Suva planina and Kosovo (around Peja). Due to the traditional use, it is important to determine the chemical composition and biological activities of these species widespread in Serbia. The aim of this study was to determine the chemical composition and antioxidant activity of noble yarrow. The content of total phenols in the prepared infusion was determined by the Folin – Ciocalteu method. Total flavonoids were determined spectrophotometrically by forming complexes with AlCl<sub>3</sub>. Chemical characterization was performed by high performance liquid chromatography. The antioxidant activity was examined spectrophotometrically by determining the "scavenger" activity of 2,2-diphenyl-1-picrylhydrazyl (DPPH), hydroxyl (OH •) radical and nitroso (NO •) radical, as well as redox potential testing by FRAP test and determination of inhibition lipid peroxidation in the Fe<sup>2+</sup> / H<sub>2</sub>O<sub>2</sub> induction system. The total phenol content in the tested infusion was 33.52 mg of gallic acid equivalent per gram of dry extract, while the content of total flavonoids was 6.79 mg of quercetin equivalent per gram of dry extract. Phenolic acids are dominantly presented in the infusion. Rosmarinic and *p*-coumaric acids are the most abundant (13.34 and 12.74 mg/g of dry extract). The infusion showed the ability to neutralize free radicals at medium high concentrations. Unlike the results of other antioxidant tests, inhibition of lipid peroxidation was not achieved. The tested plant is a good source of phenolic compounds with established antioxidant activity.

**Acknowledgements**

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**HEMIJSKI SASTAV I ANTIOKSIDANTNA AKTIVNOST ŽUČKASTOG SPORIŠA  
(*ACHILLEA NOBILIS* L. SUBSP. *NEILREICHII* (KERNER) VELEN.)**

**Katarina Radovanović<sup>1</sup>, Maja Hitl<sup>1</sup>, Biljana Božin<sup>1,2</sup>, Katarina Bijelić<sup>1</sup>,  
Blagoje Prpa<sup>1</sup>, Milica Aćimović<sup>3</sup>, Neda Gavarić<sup>1,2\*</sup>**

<sup>1</sup>Univerzitet u Novom Sadu – Medicinski fakultet, Katedra za farmaciju, Novi Sad, Srbija

<sup>2</sup> Centar za medicinsko-farmaceutska istraživanja i kontrolu kvaliteta, Novi Sad, Srbija

<sup>3</sup>Institut za ratarstvo i povrtarstvo, Novi Sad, Srbija

\* neda.gavaric@mf.uns.ac.rs

Vrste roda *Achillea* su široko rasprostranjene lekovite biljke sa poznatom tradicionalnom primenom od davnina. *Achillea nobilis* L. subsp. *neilreichii* (Kerner) Velen., u narodu poznata kao žučkasti sporiš, rasprostranjena je na teritoriji istočne Srbije, Suve planine i Kosova (okolina Peći). Zbog raširene tradicionalne primene, značajno je da se detaljno prouče hemijski sastav i biološke aktivnosti vrsta roda *Achillea* rasprostranjenih u Srbiji, pa je cilj ovog rada bio da se odrede hemijski sastav i antioksidantna aktivnost infuza žučkastog sporiša. U pripremljenom infuzu određen je sadržaj ukupnih fenola metodom po *Folin-Ciocalteu*. Ukupni flavonoidi određeni su spektrofotometrijski praćenjem formiranja kompleksa sa AlCl<sub>3</sub>. Hemijska karakterizacija izvršena je visokoefikasnom tečnom hromatografijom. Antioksidativno delovanje infuza ispitano je spektrofotometrijski određivanjem „skevindžer“ aktivnosti na 2,2-difenil-1-pikrilhidrazil (DPPH), hidroksil (OH•) radikal i nitrozo (NO•) radikal, kao i ispitivanjem redoks potencijala pomoću FRAP testa i određivanjem inhibicije lipidne peroksidacije u Fe<sup>2+</sup>/H<sub>2</sub>O<sub>2</sub> sistemu indukcije. Sadržaj ukupnih fenola u ispitivanom infuzu je 33,52 mg ekvivalenata galne kiseline po gramu suvog ekstrakta, dok je sadržaj ukupnih flavonoida 6,79 mg ekvivalenata kvercetina po gramu suvog ekstrakta. U infuzu su dominantno prisutne fenolne kiseline od kojih su najzastupljenije rozmarinska (13,34 mg/g suvog ekstrakta) i *p*-kumarna kiselina (12,74 mg/g suvog ekstrakta). Infuz je pokazao sposobnost da neutralizuje slobodne radikale pri srednje visokim koncentracijama. Za razliku od rezultata ostalih antioksidativnih testova, pomoću analiziranog infuza nije postignuta inhibicija lipidne peroksidacije. Ispitivana biljka predstavlja dobar izvor fenolnih jedinjenja sa utvrđenim antioksidantim delovanjem.

**Zahvalnica**

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