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OCTOBER 5-6 2018

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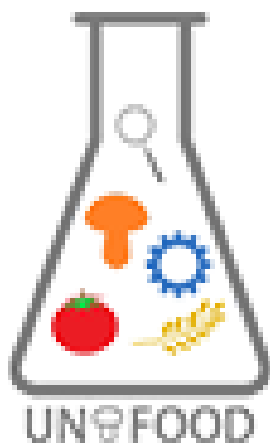
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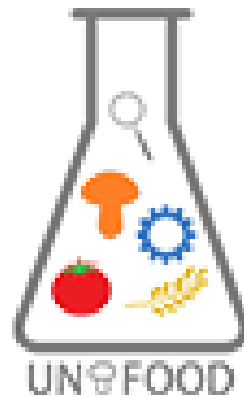


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Etarsko ulje i postdestilacioni ostatak *Juniperus communis*: antibakterijski efekat prema kontaminantima hrane i *in vitro* citotoksični potencijal na humanim ćelijama kolona

Stefana Cvetković^a, Bojana Vasilijević^a, Dragana Mitić-Ćulafić^a, Jelena Knežević-Vukčević^a, Dejan Orčić^b, Biljana Nikolić^a

^aKatedra za mikrobiologiju, Univerzitet u Beogradu-Biološki fakultet, Studentski trg 16, 11000 Beograd, Srbija

^bDepartman za hemiju, biohemiju i zaštitu životne sredine, Univerzitet u Novom Sadu-Prirodno-matematički fakultet, Trg Dositeja Obradovića 3, 21000 Novi Sad, Srbija

Prisustvo mikroorganizama u namirnicama može dovesti do kvarenja istih, ili imati ozbiljnije posledice u vidu intoksikacije ili razvoja infekcija. Usled potencijalnog štetnog efekta primene veštačkih aditiva, istraživanje prirodnih proizvoda sve više dobija na značaju. Cilj rada bio je ispitati antibakterijski efekat etarskog ulja (EO) i postdestilacionog ostatka (PDW) *Juniperus communis*. Kako bi se procenila selektivnost prema bakterijama, testirana je i citotoksičnost prema humanim ćelijama kolona (HT-29 i HCT116) i izračunate su vrednosti indeksa selektivnosti (SI).

GC-MS analiza je pokazala da je dominantna komponenta EO α -pinen (23.61%), dok je LC-MS/MS metodom utvrđeno da su rutin (12.2 mg g⁻¹) i hinska kiselina (11.1 mg g⁻¹) najzastupljeniji među identifikovanim konstituentima PDW. Rezultati MIC testa su pokazali da je efekat PDW bio jači, pri čemu je *Listeria monocytogenes* bila najosetljivija među testiranim sojevima (MIC i MBC vrednosti su iznosile 0.39 mg mL⁻¹ i 0.78 mg mL⁻¹). U daljem istraživanju, metodom šahovske table (Checkerboard test) ispitan je kombinovani efekat EO/PDW sa antibioticima (streptomycin, ampicilin, hemomicin) prema *L. monocytogenes*. Dobijeni rezultati ukazali su na postojanje svih tipova interakcija, pri čemu je sinergizam bio dominantan. Izuzetak je kombinacija EO i hemomicina, gde je pretežno dobijen indiferentan efekat. MTT testom je utvrđeno da je najveći citotoksični potencijal ostvaren primenom EO prema HT-29 ćelijskoj liniji (IC₅₀=86.9 µg mL⁻¹), dok je citotoksičnost PDW bila značajno manja.

Analiza selektivnosti ukazala je da su pozitivne SI vrednosti u odnosu na obe ćelijske linije dobijene prema *L. monocytogenes* i to nakon tretmana PDW-om. U daljem istraživanju ispitan je efekat PDW na adhezivnu sposobnost *L. monocytogenes*, pri čemu je pokazana snažna inhibicija adhezije na HT-29 i HCT116 ćelijama (28% i 62%). Dobijeni rezultati ohrabruju i stimulišu dalja ispitivanja antibakterijskog efekta PDW *J. communis*.

Juniperus communis essential oil and post-destillation waste: antibacterial effect against food contaminants and *in vitro* cytotoxicity against human colon cells

Stefana Cvetković^a, Bojana Vasilijević^a, Dragana Mitić-Ćulafić^a, Jelena Knežević-Vukčević^a, Dejan Orčić^b, Biljana Nikolić^a

^aDepartment of Microbiology, University of Belgrade - Faculty of Biology, Studentski trg 16, Belgrade, Serbia

^bDepartment of Chemistry, Biochemistry and Environmental Protection, University of Novi Sad-Faculty of Sciences, Trg Dositeja Obradovića 3, 21000 Novi Sad, Serbia

Microorganisms in foods can lead to spoilage and have serious consequences in terms of intoxication, as well as infection development. Due to potential harmful effect of synthetic additives, the investigation of natural products is encouraged. The aim of this study was to investigate the antibacterial effect of essential oil (EO) and post-destillation waste (PDW) of *Juniperus communis*. In order to estimate the selectivity against bacteria, cytotoxicity on human colon cells (HT-29 and HCT116) was determined, and the selectivity index (SI) values were calculated.

GC-MS analysis identified α -pinen (23.61%) as the dominant component of EO, while LC-MS/MS method showed that rutin (12.2 mg g⁻¹) and quinic acid (11.1 mg g⁻¹) were the most abundant among identified constituents of PDW. Results obtained in MIC assay showed that PDW was more efficient and that *Listeria monocytogenes* was the most sensitive among tested strains (MIC and MBC were 0.39 and 0.78 mg mL⁻¹, respectively). Furthermore, using the checkerboard method, the combined effect of EO/PDW with chosen antibiotics (streptomycin, ampicillin, hemomycin) was examined against the *L. monocytogenes*. Results obtained showed all types of interactions, predominantly synergism, with the exception of EO and hemomycin combination, where the indifferent effect was dominant. MTT assay indicated that the highest cytotoxic potential was obtained in the case of EO and against HT-29 cells (IC₅₀ value 86.9 µg mL⁻¹), while the effect of PDW was notably lower.

Selectivity analysis showed that the positive SI values regarding both colon cell lines were obtained only when PDW was tested against *L. monocytogenes*. According to this, in further study we monitored PDW effect on *L. monocytogenes* adhesion properties. Results showed strong inhibition of adhesion on HT-29 and HCT116 cells (28% and 62%, respectively). Obtained results are encouraging and stimulate further research of antibacterial potential of *J. communis* PDW.