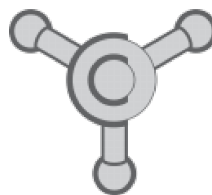


Srpsko hemijsko društvo  
Serbian Chemical Society

Klub mladih hemičara Srbije  
Serbian Young Chemists' Club



# 51. SAVETOVANJE SRPSKOG HEMIJSKOG DRUŠTVA

2. KONFERENCIJA MLADIH HEMIČARA SRBIJE

## PROGRAM

# KRATKI IZVODI RADOVA

51<sup>st</sup> Meeting of the Serbian Chemical Society

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Program  
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## Book of Abstracts

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## Biohemija / Biochemistry

BH O 01

### Soj *Streptomyces* sp. NP10 biosintetiše velike količine *n*- i razgranatih slobodnih masnih kiselina kao odgovor na prisustvo kratkolančanih masnih kiselina

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Bakterije roda *Streptomyces* biosintetišu više od polovine od 10.000 poznatih biološki aktivnih jedinjenja, pa su preko 50 godina u žiži interesovanja naučnika i industrije. Nova vrsta roda *Streptomyces*, označena kao NP10, je izolovana iz uzorka zemljišta sela Čumić, kod Kragujevca. Ova vrsta, gajena pod različitim uslovima (vreme inkubacije, hranljiva podloga, temperatura, itd.) je biosintetisala velike količine slobodnih dugolančanih masnih kiselina (C<sub>7</sub>-C<sub>31</sub>). Detaljna analiza lipidnog profila ovog soja, koja je usledila (hromatografska razdvajanja, derivatizacija, hemijske transformacije i GC-MS ko-injekcija sa standardima), je omogućila identifikaciju preko 50 masnih kiselina *n*-, *iso*- i *anteiso*-niza uključujući zasićene, nezasićene i ciklopropane kiseline. Najzastupljenije, kako slobodne, tako i vezane, su bile 12-metiltetradekanska, 14-metilpentadekanska, heksadekanska i oktadekanska kiselina. U prisustvu (u hranljivoj podlozi ili atmosferi) izomernih butanskih i pentanskih kiselina dolazi do hiperprodukcije pomenutih slobodnih masnih kiselina. Ovakva prirodna adaptacija može da predstavlja odbrambeni mehanizam protiv drugih mikroorganizama u zemljištu koji proizvode ove kratkolančane masne kiseline.

### ***Streptomyces* sp. NP10 produces a large amount of *n*- and branched free fatty acids as a response to the presence of short-chain fatty acids**

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Representatives of *Streptomyces* genus, producers of more than half of the 10,000 documented bioactive compounds, are attracting interest of both industry and academia for more than 50 years. A new *Streptomyces* sp. isolate designated as NP10 was discovered in soil sampled from the village Čumić, near Kragujevac. Under varying cultivation conditions (incubation time, nutritive medium, temperature, etc.) the species was found to accumulate considerably large amounts of free long-chain fatty acids (C<sub>7</sub>-C<sub>31</sub>). A detailed lipidomics study (chromatographic isolation, derivatization, chemical transformations and GC-MS co-injections) that followed enabled identification of over 50 different fatty acids of *n*-, *iso*- and *anteiso*- chains including both saturated, unsaturated and cyclopropyl acids. The free and bound lipid profile of *Streptomyces* sp. NP10 was dominated by 12-methyltetradecanoic, 14-methylpentadecanoic, hexadecanoic and octadecanoic acids. Interestingly, the presence (in both nutritive medium and headspace) of isomeric butanoic and pentanoic acids caused a hyperproduction of the mentioned free fatty acids by this bacterium. This environmental adaptation might be a defense mechanism against other soil microorganisms that produce these short-chain acids.

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