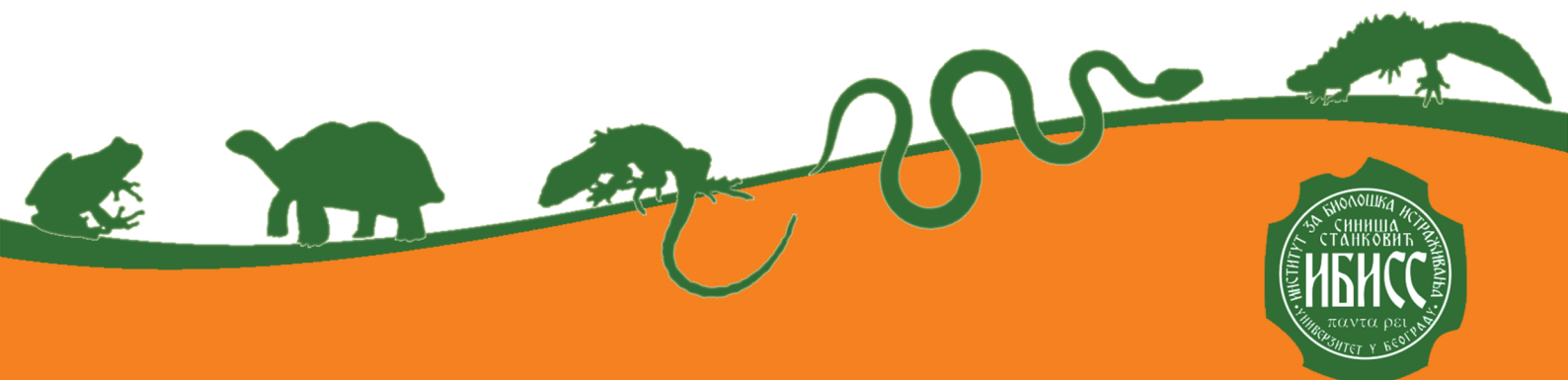




Program & Book of Abstracts

Belgrade
2022



Ecophysiology

Oral presentation

Food for thought: Venom composition of *Vipera ammodytes* from the island and mainland population is likely related with diet

Lakušić M.^{1,2,3,*}, Damm M.⁴, Bjelica V.⁵, Anđelković M.⁶, Tomović Lj.⁵, Bonnet X.⁷, Süssmuth R.D.⁴, Calvete J.J.⁸, Martínez-Freiría F.^{1,3}

¹CIBIO, Centro de Investigação em Biodiversidade e Recursos Genéticos, InBIO Laboratório Associado, Universidade do Porto, Vairão, Portugal

²Departamento de Biologia, Faculdade de Ciências, Universidade do Porto, Porto, Portugal

³BIOPOLIS Program in Genomics, Biodiversity and Land Planning, CIBIO, Vairão, Portugal

⁴Department of Chemistry, Technische Universität Berlin, Berlin, Germany

⁵Faculty of Biology, University of Belgrade, Belgrade, Serbia

⁶Institute for Biological Research “Siniša Stanković” – National Institute of Republic of Serbia, University of Belgrade, Belgrade, Serbia

⁷CEBC, UMR-7372, CNRS Université de La Rochelle, Villiers en Bois, France

⁸Laboratorio de Venómica Evolutiva y Traslacional, Instituto de Biomedicina de Valencia, CSIC, Valencia, Spain

*Corresponding author (e-mail): Margareta Lakušić (margareta.lakusic@gmail.com)

Snake venom is a complex secretion of proteins, peptides and small compounds. Being closely related to feeding, this important ecological trait is highly variable. The resulting variations are notably characterised by the abundance of different toxins, both at inter- and intraspecific levels. Here we addressed variation in venom composition of two populations of *Vipera ammodytes* from North Macedonia. One population inhabits Golem Grad Island (Prespa Lake) where vipers feed mainly on ectotherms, and the other is from the nearby mainland (Konjsko village) where endotherms are included in the diet. Using the bottom-up protocol for venom proteome analysis, five pools (insular juveniles, subadults, adult males and adult females, and adults from the mainland) were analysed, from a total of 50 individuals (46 from the island and four from the mainland). The venom profiles of the insular and mainland population differed, likely reflecting prey divergence between the sites. At the population level, in Golem Grad, venom composition showed an ontogenetic shift in the relative occurrence of different toxin families. This change is probably due to the shift in the diet; juveniles feed mainly on centipedes and small lizards, while adults essentially consume lizards. On the contrary, there was negligible variation in venom profiles of island adult males and females, likely due to their similar diet. Our results reveal fine-tuned and rapid (ontogenetic) parallel shifts in diet and venom composition and highlight the need to consider species' ecology in any causal model of venom variability.