The 21st European Congress of Herpetology

Belgrade, Serbia 5th-9th September 2022

Program & Book of Abstracts

Belgrade 2022

Institute for Biological Research “Siniša Stanković”
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EDITORS
Jelka Crnobrnja-Isailović
Tanja Vukov
Tijana Vučić
Ljiljana Tomović

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Dejan Brajović

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Tanja Vukov, Marko Mirč

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Oral presentation

Insights from the inside: 3D embryonic development of *Triturus* newts

Vučić T.[1,2,3,*], Ivanović A.[3], Cvijanović M.[4], Wielstra B.[1,2]

[1]Leiden University, Institute of Biology, Leiden, The Netherlands

[2]Naturalis Biodiversity Center, Leiden, The Netherlands

[3]University of Belgrade, Faculty of Biology, Belgrade, Serbia

[4]Institute for Biological Research "Siniša Stanković" – National Institute of Republic of Serbia, University of Belgrade, Belgrade, Serbia

*Corresponding author (e-mail): Tijana Vučić (t.vucic@biology.leidenuniv.nl)

Large-bodied newts (*Triturus* sp.) represent a good model system for evo-devo studies. Females lay relatively large eggs, which are protected by transparent jelly layer, enabling easily observation of external anatomical features throughout embryonic development – from fertilized egg to fully formed larvae. MicroCT scanning aids another, more in depth insight into the development. Virtual cross sections enable visualization of internal anatomy, while volume renderings and reconstructions of 3D models enable exploration of development of internal organs and external morphology. Throughout *Triturus* embryonic development, homozygous embryos die due to a balanced lethal system known as chromosome 1 syndrome, which involves two non-recombining types of chromosome 1 (1A and 1B). It is hypothesized that the two potential homozygous genotypes (1A1A and 1B1B) arrest at different embryonic stages and express different phenotypes. Hence, knowledge of the embryo's genotype is crucial for understanding normal embryonic development of heterozygous embryos and malformations which lead to lethality in homozygous embryos. In a pilot project, we tested and optimized a protocol for *Triturus* embryo scanning which allowed exploration of external and internal morphology while preserving the DNA. Our protocol provides an opportunity to further explore embryonic development in *Triturus* in diverse research lines: 1) normal embryonic development as a base line for further studies; 2) arrested development to uncover the basis of lethality; and 3) testing various evo-devo hypotheses.