The 21st European Congress of Herpetology

Belgrade, Serbia 5th-9th September 2022

Program & Book of Abstracts

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Institute for Biological Research “Siniša Stanković”
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Poster presentation

Craniofacial development of *Triturus* newts – a suitable model system for testing the developmental hourglass model

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In developmental biology a plethora of studies support the existence of a conserved stage during the ontogeny of vertebrates – the pharyngula. The developmental hourglass model predicts that the most conserved morphological pattern occurs in the middle of embryonic development. We explored external morphology of the craniofacial region of *Triturus* newts using 3D geometric morphometrics. The craniofacial region was selected because it experiences pleiotropic developmental constrains due to its major role in feeding, respiration and the housing of substantial parts of nervous and sensory systems. We aimed to uncover differences in variance between successive developmental stages, because it is proposed that the more constrained stages should have the lowest variance. In addition, we explored differences in the craniofacial shape between successive developmental stages. Stages included start from the moment after the completion of neurulation and span the mid-tailbud phase. The least amount of variance in shape was recorded at stage 24 (according to D'Amen and colleagues). In general, this stage is characterized by changes in overall head shape, the distinction of optical vesicles, intensive somitogenesis and formation of the tailbud which overgrows the blastopore, indicating that these processes could be highly constrained. Only significant craniofacial shape change occurred between this and successive stage. The most pronounced differences were due to growing of the head region and gill bud balancers. Optic vesicles became concave due to inductive processes preceding eye formation. These preliminary results indicate that stage 24 could be the most conserved one during early ontogeny as it is preceded and followed by stages exhibiting more variance in shape. Our results indicate that the craniofacial development represents a suitable model system for testing the hourglass model of development. Larger sample size, exploration of the entire embryonic development and ontogeny of additional newt species is needed to confirm our preliminary findings.