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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Oral presentation

Vertebral regionalization vs. morphological integration in *Lissotriton* newts

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Serially homologous structures, such as the vertebral column, often undergo functional and evolutionary diversification and are a good model-system for studies of regionalization and morphological integration. We studied these topics in the vertebral column (atlas, trunk and sacral vertebrae) of the closely related taxa of small-bodied newts – *Lissotriton schmidtleri, L. vulgaris ampelensis, L. v. meridionalis* and *L. v. vulgaris*, using 3D geometric morphometrics on models that were acquired with micro-CT scanning. Two different statistical approaches were employed to test for vertebral regionalization and overall morphological integration, namely segmented linear regression (SLR) and a partial least squares method (PLS) We observed a common pattern of regionalization, with a transition point after the 5th trunk vertebra. It corresponds with the antero-posterior transition common for tetrapods. Morphological integration, accessed via PLS analysis, is strongest at the 6th and 7th trunk vertebrae, while the anterior and distal parts of the vertebral column are less integrated. The PLS analysis of the asymmetric component of shape variation revealed a weak integration, statistically significant only among subsequent trunk vertebrae. In summary, the vertebral column of the closely related *Lissotriton* newts is subtly regionalized, while being morphologically integrated overall. There is a complex relationship between regionalization and morphological integration of the vertebral column, most likely influenced by the newt's bi-phasic life cycle that instigates different functional constraints in the aquatic and terrestrial life stages.