



Fresh insights into the rise of the ray-finned fishes

Sam Giles (1), Stephanie Pierce (2), Matt Friedman (1,3)

(1) University of Oxford, Oxford, UK (sam.giles@earth.ox.ac.uk), (2) Harvard University, Cambridge, USA (spierce@oeb.harvard.edu), (3) University of Michigan, Ann Arbor, USA (mfriedm@umich.edu)

Ray-finned fishes account for over half of living vertebrate diversity, with an evolutionary history stretching back nearly half a billion years. Recent reorganisation of the ray-fin tree has revised our understanding of relationships while raising major questions about the origin of the living radiations and the impact of the end-Devonian mass extinction on the group. New anatomical data obtained from computed tomography (CT) scanning has the potential to provide fresh insights into the early history of ray-finned fishes. Detailed investigation of small-bodied Late Devonian taxa reveals surprisingly derived features that are more typically associated with Carboniferous and younger taxa. Phylogenetic analysis places these small-bodied Late Devonian taxa among post-Devonian forms, with implications for patterns of divergence prior to the end-Devonian. These results have important implications for patterns of evolution early in actinopterygian history, and the impact of the Hangenberg mass extinction on ray-finned fishes.