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Convergent allometric trajectories in Devonian–Carboniferous unornamented *Polygnathus* conodonts

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The shape of feeding structures is reputed to be under functional constraints related to the processing of food particles. Their morphological variation through evolution and ontogeny may thus provide an insight into changes in occlusal dynamics and diet. The present study therefore aims at characterizing allometric trajectories of oral elements of *Polygnathus* conodonts, with a focus on caudal P1 elements that functioned in occlusion like mammalian molars. The shape of the elements, collected at the Puech de la Suque section, France, ranging from the uppermost Devonian to the lowermost Carboniferous, was quantified using a three-dimensional morphometric geometric approach, focusing on the most abundant unornamented conodonts. *Polygnathus* elements varied in size and shape along the record, leading to the definition of four successive Operational Taxonomic Units (OTUs). The pattern of bilateral asymmetry remained stable across these OTUs. In contrast, allometric trajectories displayed several reorientations, due to different juvenile morphologies but similar adult shapes. Both within and across OTUs, small-sized unornamented *Polygnathus* elements displayed a higher disparity than large-sized ones, suggesting higher constraints on the morphology of the later. These findings suggest that the constraints on adult *Polygnathus* remained important but relatively stable over

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