

Abstract

Polypterid fishes are considered the basal-most group of extant actinopterygians and thus may serve as a direct link for understanding the evolution of the first bony fishes. Their embryonic and larval material, however, is extremely scarce what makes it difficult to study their developmental patterns and processes. This work of mine is based on several successful breedings of the bichir *Polypterus senegalus* that allowed me to analyse development of some 70 specimens at key developmental stages. I have focused my attention to the early morphogenesis of teeth and dentition on several locations within a developmental context of oropharyngeal cavity. Oropharyngeal cavity develops quite differently when compared to other vertebrate species: it arises by means of a schizocoelic-like split of epithelial layers and, moreover, the earliest mouth cavity seems to be strongly constrained by the presence of cement (attachment) glands. Mouth opening proceeds by development of new, enigmatic structures that I have entitled the epithelial bridges (Kralovic et al., 2009) and that might represent the ectoderm-endoderm border often judged to be essential for tooth initiation and patterning. I have described a pronounced delay in initiation of pharyngeal teeth when compared to the oral teeth, probably as a direct consequence to the similar heterochronic development of skeletal elements. Enlarged dental patches developing on the fourth ceratobranchial resemble pharyngeal jaws of some Teleostei. The manner in which dentition on the fourth ceratobranchial develops parallels development of teeth on some tooth-bearing bones within oral cavity and this data are discussed in a comparative context. This Diploma work thoroughly describes some dental features of the bichir *Polypterus senegalus* and their developmental dynamics within an oropharynx, as well as discusses this data within a broad comparative context of vertebrates.