

# Abstract

Calcified teeth comprise the hardest vertebrate tissues (enamel and dentine) and they undoubtedly represent a key evolutionary advantage for their users. Nevertheless, teeth have been lost many times and they were often replaced by keratinised structures, such as rhamphotecca of birds or of turtle beaks, or labial tooth structures and scratching laminae of many aquatic vertebrates. This thesis is intended to analyse levels of similarities among keratinised teeth and structures of three phylogenetically distinct lineages of amniotes and to compare them to morphogenesis of true teeth. Detailed developmental and structural characteristics of oral apparatus possessing keratinous teeth of lampreys, Loricarid catfishes and frog tadpoles were identified and distinguished. Keratinous structures of catfishes include only horny projections from single cell surface (unculi), whereas in frog tadpoles both horny jaw sheet and unicellular labial teeth composed by cell columns were found; the lamprey oral apparatus consists of multicellular teeth and laminae instead. Disparate phenotypes of these keratinous structures can, however, developmentally derive from a general process of keratinization: morphological disparities arise by distinct gradual accretion of keratinous layers and columns during development. My analysis also revealed that all these so called epidermal structures develop in a close proximity to mesenchyme condensations, what surprisingly reminds morphogenesis of odontode-based structures like teeth. Among keratinous structures studied, lamprey teeth undoubtedly possess the most similarities to true teeth. They have similar histo- and morphogenesis and their formation also includes mesenchymal papilla. Moreover, teeth of lamprey oral disc were found interconnected by distinct epithelial lamina, what represents another striking similarity to vertebrate teeth, which are commonly organised into dentition by the so-called dental lamina.

**Key words:** horny structures, teeth, lamprey, tadpole, catfish, dental lamina, mesenchymal papilla