

## Development of the Squamate Egg Tooth on the Basis of Grass Snake Natrix natrix Studies

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**Abstract :** The egg tooth is a crucial structure during hatching of lizards and snakes. In contrast to birds, turtles, crocodiles, and monotremes, egg tooth of squamate reptiles is a true tooth sharing common features of structure and development with all the other teeth of vertebrates. The egg tooth; however, due to its function, exhibits structural differences in relation to regular teeth. External morphology seems to be important in the context of phylogenetic relationships within Squamata but up to date, there is scarce information concerning structure and development of the egg tooth at the submicroscopical level. In presented studies detailed analysis of the egg tooth development in grass snake has been performed with the usage of light (including fluorescent), transmission and scanning electron microscopy. Grass snake embryo's heads have been used in our studies. Grass snake is common snake species occurring in most of Europe including Poland. The grass snake is characterized by the presence of single unpaired egg tooth (as in most squamates) in contrast to geckos and dibamids possessing paired egg teeth. Studies show changes occurring on the external morphology, tissue and cellular levels of differentiating egg tooth. The egg tooth during its development changes its curvature. Initially, faces directly downward and in the course of its differentiation, it gradually changes to rostro-ventral orientation. Additionally, it forms conical dentinal protrusions on the sides. Histological analysis showed that egg tooth development occurs in similar steps in relation to regular teeth. It undergoes initiation, bud, cap and bell morphological stages. Analyses focused on describing morphological changes in hard tissues (mainly dentin and pre-dentin) of egg tooth and in cells which enamel organ consists of. It included: outer enamel epithelium, stratum intermedium, inner enamel epithelium, odontoblasts, and cells of dental pulp. All specimens used in the study were captured according to the Polish regulations concerning the protection of wild species. Permission was granted by the Local Ethics Commission in Katowice (41/2010; 87/2015) and the Regional Directorate for Environmental Protection in Katowice (WPN.6401.257.2015.DC).

**Keywords :** hatching, organogenesis, reptile, Squamata

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