



Iterative Evolution in Triassic Gondolelloidea (Conodonta)

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Abstract

The phylogeny and distribution of Triassic gondolelloid conodont multi-elements reveals aspects of their natural history. In conodont phylogeny, taxonomy incorporates the morphologic riposte to temperature as well as to eustatic cycles, expressed in speciation, radiation and extinction as these are not fortuitous and evolution uses diverse strategies such as heterochrony (progenesis and neoteny) in response to stress generating events. Proteromorphosis (reappearance of ancestral morphs) and paedomorphosis (retention of juvenile traits) is a reaction to sublethal environmental stress. It is often followed by radiation of fully developed forms, in the recovery stage after extinction, timely matching transgressions. Evolutionary retrogradation (neoteny) during eustatic high stands often precedes extinction. This was the case of the Alaunian Mockina whereafter the ultimate Misikella brought no post-Rhaetian recovery.

The Late Triassic, an extremely long time span of 37 Ma represents 70 % of the total length of the period. Evolutionary rebounds after quasi extinction of subfamily Neogondolellinae, by radiation, out of the single surviving genus Paragondolella: Julian Metapolygnathus and Mazzaella, and Tuvalian-Lacian Metapolygnathus-Carnepigondolella-Ancyrogondolella. The survival of the clade throughout Alaunian and Sevatian took place by successive retrogradations (proteromorphosis) of the Alaunian Mockina and Sevatian-Rhaetian Misikella, bringing no ultimate post-Rhaetian recovery.

The cryptic gondolellid features, encoded in “neospathid” proteromorphs permitted the conodont survival throughout the entire Triassic, signaling Dienerian, Anisian, Ladinian, Carnian, and Norian crises, extreme and ultimately vain in the terminal Rhaetian.

Key words: Triassic; Conodonts; Phylogeny; Evolution; Proteromorphosis.