THE GENERATIVE PHASE AND THE FIRST RADIATION IN EVOLUTION OF THE EARLY LLANDOVERY MONOGRAPTIDS

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Glacio-eustatic regression of the late Ashgill gave rise to the drastic climatic and oceanographic changes. This resulted in a disruption of pelagic palaeoecosystems at low to middle palaeolatitudes and, consequently, in mass extinctions of the main biological components including graptolites. Elimination of both, the successfully radiating and regressively developing diplograptids resulted in the appearance of empty niches and acceleration in the emergence of the first monograptid colony in the *persculptus* Biozone. The transition from biserial to uniserial based on modification of the astogenetic pattern was the last radical change in the basic structure of graptolite colony.

The first generative phase in monograptid evolution showed neither morphological, no taxonomical variety in the colony and theca structure. An extremely long and slender rhabdosome with various degree of dorsal curvature retained the ancestral characters of thecal and sicular morphology (the *primitivus* morphotype). The present uncertainties in the reconstruction of the glyptograptid or/and parakidograptid origin of the earliest monograptids are due to the absence of transitional morphological series and the unsatisfactory preservation in the limited numbers of hithertho known localities (China, Arctic Canada, South Urals). However, other important changes in orientation of theca 2 do not seem to be always consistent with onthogenetic modificatios of the siculozooid (Lukasik & Melchin, 1994; Bjerreskov & Koren, 1995).

The first radiation event at the beginning of the *vesiculosus* Biozone is well represented in the Bornholm and South Urals sections. It resulted in a significant increase in diversity of derived thecal morphologies based on a simple atavus morphotype. This can be interpreted as a sign of an increasing trophic specialisation resulting from broadening of available ecospace which is consistent with the achievement of a global distribution of monograptids. At the same time monograptids retained general rhabdosome structure and size. The *vesiculosus* Biozone monograptids shared with contemporaneous rhaphidograptids and dimorphograptids a number of morphological tendencies, such as attenuation and elongation of proximal end. In general almost all morphological changes took place early in the astogeny and the main criteria used in the taxonomical differentiation are those characteristic for the overall structure of the extreme proximal part of the rhabdosome. The remarkable feature typical for almost all monograptids within the *vesiculosus* Biozone is the high position of the theca 1 bud at metasicula, which is also seen in the contemporaneous akido- and dimorphograptids. This can be interpreted as an important morphological novelty introduced in several lineages during the first radiation event. The late *vesiculosus* Biozone shows the first diversity maximum and geographic expansion of the post-crisis graptolites when a relative stability of pelagic ecosystems was restored.