

COMPETITIVE OVERGROWTH AND POST-PALEOZOIC MACROEVOLUTION OF MARINE BRYOZOA

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The Lower Ordovician through Upper Jurassic record of the phylum Bryozoa consists almost entirely of the class Stenolaemata, excepting a very few Gymnolaemata (ichnofossils of the order Ctenostomata and, in the uppermost Upper Jurassic, *Pyriporopsis*, which is the oldest known Cheilostomata). Along with the decline to eventual extinction of most Paleozoic stenolaemates beginning with the end-Permian crisis, the stenolaemate order Cyclostomata radiated in Late Triassic and Jurassic to include the diversity of growth forms and locally the abundance common for Paleozoic bryozoan faunas. By late Cretaceous, however, cheilostomes had diversified and had come to dominate in bryozoan faunas; they have continued to dominate to the present.

In the abundant and diverse bryozoan fauna of the northern Adriatic Sea, cheilostomes are four to five times as diverse and are orders of magnitude more abundant than are cyclostomes. Within this fauna, encrusting sheet-like cheilostomes consistently overgrow adjacent encrusting cyclostomes. Different ontogenetic patterns of skeleton and organs, as well as larger zooid sizes at colony margins, produce patterns of feeding currents that allow cheilostomes to deliver their filtered water to and to overtop competing cyclostomes at interacting margins. These Bauplan differences apparently constitute a key evolutionary innovation characterizing the Cheilostomata. Along with higher growth rates in most cheilostomes, this key evolutionary innovation should have given cheilostomes a competitive edge since the origin of multiserial colonies within the clade in Early Cretaceous. It is hypothesized that superior overgrowth capability of cheilostomes has been an important factor in their success and the relative decline of cyclostomes.