

The origin of ammonoid locomotion

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Evolution of the coiled ammonoid conch from the uncoiled bactritid conch was probably coupled with changes in manoeuvrability and swimming velocity. The gradual transformation of uncoiled to coiled ammonoid conchs has essential functional consequences. The radical change in conch geometry during phylogeny but also in ontogeny of early ammonoids implies a shift of the aperture from an original roughly downward, via a downward oblique and an upward oblique to an upward orientation, presuming a neutrally buoyant condition of the ammonoid animal. Similar trends were reconstructed for the three main ammonoid lineages in the Middle Devonian, the agoniatitid, the anarcestid, and the tornoceratid lineages. This allowed an increase in manoeuvrability and in the maximum horizontal swimming speed.

Key words: Bactritida, Ammonoidea, ontogeny, phylogeny, locomotion, coiling, Devonian.

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