

A new genus of middle Tremadocian orthoceratoids and the Early Ordovician origin of orthoceratoid cephalopods

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The cephalopods of the subclass Orthoceratoidea, which are termed “orthoceratoids” herein, are a group that remains “the last unexplored wilderness in the Cephalopoda” (Flower 1962: 23). After 45 years this statement still holds true because phylogeny reconstructions are hindered by their morphological simplicity, numerous homeomorphies and iterative evolution. The Orthocerida, straight cephalopods that are characterised by a wide chamber spacing, a thin tubular siphuncle and a small spherical initial chamber, lacking a cicatrix (Kröger 2006) were the ancestors of bactritoids, ammonoids, and coleoids (Engeser 1996). The origin of the Orthocerida is poorly understood. The earliest unequivocal Orthocerida are known from the Floian (Early Ordovician). A number of poorly known possible Orthocerida and/or stem group Orthocerida are known from the Tremadocian. Here, I reassign the long known middle Tremadocian “*Orthoceras attavus*” to the new genus *Slemmestadoceras* belonging to a group of world-wide distributed orthoceratoids. The presence of *Slemmestadoceras* with a thin, probable tubular siphuncle and small initial chambers in the middle Tremadocian suggests that the Orthocerida may have originated already at that time. The comparison of *Slemmestadoceras* with following late Tremadocian and Floian orthoceratoids demonstrates that a higher level taxon comprising these forms, such as the subclass Orthoceratoidea may constitute a paraphylum.

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