UPPER CAMBRIAN CHITONS (MOLLUSCA, POLYPLACOPHORA) FROM MISSOURI, USA

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ABSTRACT
Numerous new specimens reveal a greater presence of chitons in Upper Cambrian rocks than previously suspected. Evidence is presented showing that the chiton esthete sensory system is present in all chiton species in this study at the very beginning of the known polyplacophoran fossil record. The stratigraphic occurrences and paleobiogeography of Late Cambrian chitons are documented. The 14 previously-named families of Cambrian and Ordovician chitons are reviewed and analyzed. Aulochitonidae n. fam. is defined, based on Aulochiton n. gen.; A. sannerae n. sp. is also defined. The long misunderstood family Preacanthochitonidae and its type genus Preacanthochiton Bergenhayen, 1960, are placed in synonymy with Mattheviidae and Chelodes Davidson & King, 1874, respectively; Eochelodes Marek, 1962, is also placed in synonymy with Chelodes, and Elongata Stinchcomb & Darrough, 1995, is placed in synonymy with Hemithecella Ulrich & Bridge, 1941. At the species level, H. elongata Stinchcomb & Darrough, 1995, and Elongata perplexa Stinchcomb & Darrough, 1995, are placed in synonymy with H. eminensis Stinchcomb & Darrough, 1995. The Ordovician species H. abrupta Stinchcomb & Darrough, 1995, is transferred to the genus Chelodes as C. abrupta (Stinchcomb & Darrough, 1995). The Ordovician species Preacanthochiton baueri Hoare & Pojeta, 2006, is transferred to the genus Helminthochiton as H. baueri (Hoare & Pojeta, 2006). The Ordovician species H. marginatus Hoare & Pojeta, 2006, is transferred to the genus Litochiton as L. marginatus (Hoare & Pojeta, 2006). Matthevia walcotti Runnegar, Pojeta, Taylor, & Collins, 1979, is treated as a synonym of Hemithecella expansa Ulrich & Bridge, 1941. In addition, other multivalved Cambrian mollusks are discussed; within this group, Dycheiidae n. fam. is defined, as well as Paradycheia duriae n. gen. and n. sp. Cladistic analysis indicates a close relationship among the genera here assigned to the Mattheviidae, and between Echinochiton Pojeta, Eernisse, Hoare, & Henderson, 2003, and mattheviids. The results suggest treating these taxa as stem-lineage chitons, and do not support the hypothesis that they are aplacophorans.