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* Bergenhayn, 1960, are placed in synonymy with Mattheviidae and *Chelodes* Davidson & King, 1874, respectively; *Eochelodes* Marek, 1962, also is 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 dorisae* 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.