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The Marjuman trilobite *Cedarina* Lochman: thoracic morphology, systematics, and new species from western Utah and eastern Nevada, USA

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Abstract

Cedarina schachti **n. sp.** from the Marjuman (*Cedaria* Zone) Weeks Formation of western Utah, USA, provides the first information on thoracic morphology within the genus. Its thorax is radically different from those of species of *Cedaria* Walcott, with which *Cedarina* Lochman has been classified in Cedariidae Raymond, but strikingly similar to those of plesiomorphic remopleuridoideans grouped in the paraphyletic Richardsonellinae Raymond. If *Cedarina* and the remopleuridoideans are genuinely related it follows that 1) Cedariidae as traditionally conceived is paraphyletic; 2) *Cedarina* is a plesiomorphic sister taxon of the remopleuridoideans; and 3) the remopleuridoideans are not a component of the Order Asaphida. Silicified material of a second new species, *C. clevensis* from the Marjuman (*Crepicephalus* Zone) Lincoln Peak Formation of eastern Nevada, confirms the presence of a long thoracic axial spine and provides the first information on ontogenetic development and ventral morphology within the genus.

Key words: Trilobita, Cedariidae, Remopleuridoidea, *Cedarina*, taxonomy, Cambrian

Introduction

Cedariidae Raymond, 1937, has been understood as a mainly Laurentian clade which is common in rocks of the upper Marjuman Stage. The main morphological feature used to define the group has been a "cedariform" facial suture, in which the posterior section of the facial suture curves forward toward the librigenal field, giving the posterior fixigenal projection a lobe-like appearance and with the librigenal field concomitantly reduced in length and separated from the base of the genal spine. This is an unusual morphology in trilobites, seen elsewhere only in the unrelated Ordovician-Devonian family Scharyiidae Osmólska, 1957, and there is every reason to suspect that it is a synapomorphy of a clade including the "cedariids."

New information presented herein, however, challenges the monophyly of Cedariidae. A new species of *Cedarina* Lochman, 1940, from the Weeks Formation of western Utah, reveals the first known thorax for the genus. *Cedarina* has universally been considered a cedariid, but its thoracic morphology is strikingly different from other members of the group, and very similar to that of plesiomorphic members of Remopleurididae Hawle and Corda, 1847. The goals of the present work are the description of *C. schachti* and discussion of its potential implications for trilobite systematics. Additional morphological information is provided by rare but well preserved silicified sclerites from the Lincoln Peak Formation of eastern Nevada, described below as *C. clevensis* **n. sp.**

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