

Siliciclastic Cave-Fill Deposits within pre-Pennsylvanian Paleocaves of the Mississippian Burlington-Keokuk Limestone in Southwest Missouri

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Two siliciclastic-filled (sandstone and shale) paleocaverns within the Mississippian (Osagean) Burlington-Keokuk Limestone, which were formed in pre-Pennsylvanian (pre-Desmoinesian) time, are described from exposures in Dade County, Missouri. Petrographic and sedimentological analyses suggest that these cave-fills were derived from terrestrial deposits of the Warner formation during Early Desmoinesian (Middle Pennsylvanian) deposition. Such cave-fill deposits appear to be productive hydrocarbon reservoirs in subsurface Kansas and perhaps elsewhere.

One of the caves examined is filled primarily with coarse- to fine-grained sand. Sedimentary structures include cross-stratification, scours, flaser bedding, soft-sediment deformed layers, flame structures, and normal-graded bedding. Cave-roof collapse and associated boudinage, as well as slack water shales, separate thick sandstone layers. This paleocavern has been interpreted to have been filled by fluvio-karst processes with sediment entering primarily through sinking streams. The cave-fill in the other paleocave examined is primarily mudrock, shale, and sandy siltstone with some roof-collapse breccia. These rocks contain abundant organic matter, including wood fragments, and abundant pyrite and secondary sulfate minerals. This paleocave has been interpreted to have been filled by colluvium entering through sinkhole collapses beneath marshes or swamps and by some in-flowing, low-energy water currents.