
Sedimentology and Depositional History of the Riley Formation in the Northwestern Llano Uplift near Pontotoc, San Saba County, Texas

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ABSTRACT

The Upper Cambrian Riley Formation consists of the Hickory Sandstone, Cap Mountain Limestone, and Lion Mountain Sandstone. Deposition occurred on a passive margin of Laurentia during the Sauk cratonic sequence. This study will provide a detailed analysis of the Riley Formation near Pontotoc, Texas using sedimentological and petrological methods. The Hickory Sandstone consists of a medium-grained (monocrystalline, 99%; and polycrystalline, 1%) quartz arenite deposited in a beach environment that is indicated by the presence of *Thalassinoides* and *Skoliothos* trace fossils. Facies of the Hickory Sandstone include a thin-bedded sandstone of the middle Hickory, and ironstone and laminated sandstones of the upper Hickory. The Cap Mountain Limestone consists of a fine to medium grained, cross-bedded quartz arenite to quartz wacke deposited in a beach environment. Facies of the Cap Mountain Limestone consist of simple cross-bedded sandstone, massive bedded limestone, and planar cross-bedded sandstone. The Lion Mountain Sandstone consists of a glauconitic, medium grained, quartz arenite deposited in a beach environment. Paleocurrent analysis of the Riley Formation displays a bimodal pattern. Eogenesis features consisted of colophane, iron oxide, siderite, aragonite, and calcite cementation. Mesogenesis features consisted of compaction, grain deformation, dissolution of grains, and pressure dissolution. Telogenesis features consisted of calcite cementation.