

20.05 **Eocene age fossilized filamentous bacteria: New evidence suggesting a bacterial genesis of siderite in the Green River Formation, Wyoming**

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The discovery of exquisitely preserved filamentous bacteria from the Green River Formation, Green River Basin, Wyoming suggests a relationship between bacteria and the formation of the iron carbonate mineral, siderite (FeCO_3). Comparative mineralogical studies of the Green River Formation, have suggested a previously undefined controlling mechanism for siderite precipitation/distribution. Most abundant at the level of the Tipton/Wilkins Peak boundary, siderite has been characterized geochemically as part of a drying and concentrating episode of Lake Gosiute. This period in the lake's history would have had a high potential for increased alkalinity and available ionic iron leached from volcanoclastic sources. Siderite is known to precipitate from saturated solutions which are in equilibrium with CO_2 gas or contain a fixed amount of carbonate ions. Another possibility for siderite formation that has been suggested is a bacterial origin involving the reduction of iron in anaerobic sediments. Certain modern filamentous bacteria for example, *Lipothrix* and *Crenothrix*, are characterized by flocculent masses of hydrated ferric hydroxide which is collected on a bacterial sheath. As the bacteria shed their sheath and grow a new one, they leave behind an iron-rich bacterial framework which might serve as a center for siderite nucleation. New Scanning Electron Microscopic (SEM) observations have identified Eocene Age fossilized bacteriamorphs from the Tipton/Wilkins Peak boundary which bear an uncanny resemblance to their modern counterparts. These data seem to suggest validation for a bacterial genesis of siderite.