

Organic carbon flux controls the morphology of magnetofossils in marine sediments

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Magnetotactic bacteria produce chains of magnetite crystals within a cell. Bacterial magnetites have characteristic morphologies and sizes under strict biological control. We examined morphologies of fossil bacterial magnetites (magnetofossils) preserved in Pacific deep-sea sediments and its relation to organic carbon fluxes. Isotropic crystals dominate magnetofossils in sediments in a relatively oxidized condition and anisotropic crystals in a more reduced condition. Our finding has important implications for biomineralization processes, and demonstrates the potential of magnetofossil morphology as a paleoenvironmental indicator.