

Isolation of Magnetotactic Bacteria from a Graphite Mine in Upstate New York

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Magnetotactic bacteria have the ability to orient and migrate along geomagnetic field lines. This unique ability is due to specific intracellular organelles called magnetosomes, which are membrane bound crystals of iron oxides called magnetite oriented linearly inside the bacterial cells. The properties of magnetotactic bacteria are of increasing interest in many fields, including environmental science and biogeology, and bacterial magnetites have proven useful as tools in both biological research and medicine. A sample of water from a graphite mine in Hague, New York was analyzed for the presence of magnetotactic bacteria. Potential magnetotactic bacteria were concentrated using a neodymium magnet attached to the sample. The concentrated sample was then isolated using the streak plate method on a ferric quinate agar medium incubated at 25°C. The isolated colonies were then tested for magnetotaxis by observing the movement of bacteria in the presence of a magnetic field. A magnetotactic bacteria was isolated using this method and presumptively identified as *Aquaspirillum magnetotacticum*. The presence of magnetotactic bacteria in an area of high nonmagnetic material shows the wide environmental range of these bacteria. Previously magnetotactic bacteria had only been isolated from areas containing high amounts of magnetic materials such as pond or sea water. This research expands the range of possible habitats for *Aquaspirillum magnetotacticum*. This expanded ranges shows the ability of *Aquaspirillum magnetotacticum* to adapt to environments that do not provide large concentrations of the materials needed to maintain magnetotaxis.