Bacteria from the deep can clean up heavy metals

June 5 2009

A species of bacteria, isolated from sediments deep under the Pacific Ocean, could provide a powerful clean-up tool for heavy metal pollution.

Writing in the current issue of the journal, *Microbiology*, Professor Gejiao Wang and his colleagues from Huazhong Agricultural University in Wuhan, PR China describe how a particular strain of *Brachybacterium*, strain Mn32, proved to be highly effective in removing manganese from solutions, converting it into insoluble manganese oxides.

Not only did the bacterium directly oxidize the manganese but the resulting oxides themselves also absorbed the metal from the culture solution, making *Brachybacterium sp Mn32* a potentially useful candidate for use in bioremediation and cleaning up pollution.

As well as removing manganese from its environment, the *Brachybacterium* also absorbed significant amounts of zinc and nickel. All of these metals are found as pollutants in water and soils contaminated by heavy industries such as steel-making.

Manganese oxides can be manufactured chemically and are known to absorb zinc and nickel; but the oxides produced by this bacterium absorbed two- to three- times more metal. Professor Wang's team showed that the crystal structure of the bacterial manganese oxides is different to that of the chemically produced ones, with a greater surface area which enables more of the metal ions to be absorbed.

Describing the work, Professor Wang said, "The next stage of our research is to immobilize this bacterial strain into a bioreactor to test its ability to remove manganese and other heavy metals in such a system. If successful it could provide a more efficient way to clean up heavy metal pollutants."

Source: Society for General Microbiology