IRON BACTERIA

INTRODUCTION

The term Iron Bacteria does not refer to a specific genus or species of bacteria but rather to those bacteria in which reduced iron plays an important role in their metabolism. In the water environment one becomes aware of their existence when the results of the bacterial metabolism produces large amounts of oxidized iron as evidenced by "rusty" water. It should be emphasized that not all rusty water is the result of bacterial activity and in many cases is the result of physical chemical processes.

A great variety of bacteria can be involved in this process. The "true" iron bacteria are those in which the oxidation of iron is an important source for their metabolic energy. This group is most often associated with filamentous and stalked forms that are incrusted with iron *(Leptothrix, Clonothrix and Gallionella).* These genera of bacteria are difficult or impossible to cultivate and are normally identified and/or enumerated by direct microscopy. This is generally the best that a laboratory such as BioVir can do!

There are also acidophilic iron bacteria., the prime example being the autotroph *Ferrobacillus ferroxidans*, which is able to oxidize iron in low pH environments and is most commonly found associated with acid mine waste. The acidophilic bacteria are not commonly found in drinking water supplies. These can be cultivated.

METHOD

The Standard Methods Section on Iron bacteria (9240) refers to both microscopic and cultural methods for these bacteria. In reality this does not mean that the proposed methods (particularly the cultural methods) are practical or even possible. The methods proposed can be summarized as follows:

i. The cultural methods are not designed to quantitate but rather to enrich and would give only presence or absence results.

ii. The direct microscopic exam gives only presence absence results as well.

iii. Identification using the direct microscopic method is limited to filamentous iron oxidizers.

iv. The cultural methods employed are "hit or miss" in their accuracy.

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