



## EARLY EXPERIENCES IN MINERAL BIOTECHNOLOGY IN DURANGO, MEXICO

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This research pretends to show, especially to the student community, the virtues of using biotechnology in the productive mining sector, mainly due its environmental problems, which implicate arsenic and manganese presence in concentrates as well as mineral tailings (1). Also, it is desired to discuss about the importance of how to “sell” alternatives to this mining issue through research projects that allow Research Institutes to show, with evidences, their extension capacity with productive sectors. Arsenic is found as pollutant at levels up to 10%, appearing in valuable metals concentrates such as gold, silver, zinc, and lead, among others, representing a conflict whenever such concentrates move to a melting stage, causing detriments inside the ovens’ walls, besides generating vapors containing arsenic. Manganese, which is found as pollutant at levels up to 1-1.5% in concentrates and mining tailings, forces to use more sodium cyanide in precious metals recovery. The residues end up at the tailings’ dumps as residual cyanide, reaching elimination levels of this material above 90% at lab scale as well as pilot plant scale, including experiences at mine level in a rotatory reactor for manganese. All the researches using native *Thiobacillus ferrooxidans* stains have generated human resources at masters and doctoral levels in the bioengineering area, who, mostly, are currently working in the mining industry as well as generating patents of industrial interest.

Hiram Medrano-Roldán y Col. 2004. *Biología Financiera*. Editorial Instituto Tecnológico de Durango.

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