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# ISOLATION AND IDENTIFICATION OF BACTERIAL STRAINS IN AEROSOLS SAMPLES FROM AN A IRON FOUNDRY AND STUDY OF THEIR RESISTANCE TO HEAVY METALS

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**Statement of the Problem:** Air pollution poses a significant environmental risk to health. Different investigations have shown the presence of bacteria in the atmosphere. However, few studies of air quality based on microbiological components have been carried out in Cuba. In general, investigations are focused on physical and chemical characterization of different atmospheric pollutants. The aim of this research was to isolate and identify bacterial strains present in workplace atmosphere in an iron foundry and determinate their resistance to heavy metals.

**Methodology & Theoretical Orientation:** Indoor air samples were collected from an iron foundry located in Villa Clara province, Cuba. To identify the bacteria of the pure cultures, their 16S rRNA genes were amplified and sequenced. The identification was performed with the BLAST program. To study the resistance of isolated bacteria different concentrations of Fe, Zn, Cu, Pb, Sn, Al and Mn in the form of their salts were tested using alamarBlue®

**Findings:** 11 isolated bacteria were identified. They are Pantoea agglomerans, Enterobacter cloacae, Staphylococcus aureus, Bacillus oceanisediminis, Bacillus flexus and Exiguobacterium aurantiacum. All bacterial strains showed an increase in the cell viability at high concentrations of Fe, Zn and Cu and, at low concentrations of Mn. However, all Pb concentrations conducted to an increase of the cell viability for Exiguobacterium aurantiacum whereas for Bacillus oceanisediminis this increase was observed only at high concentrations. Staphylococcus aureus, Bacillus oceanisediminis, Pantoea agglomerans, Bacillus flexus and Exiguobacterium aurantiacum showed increased cell viability at high concentrations of Sn while Pantoea agglomerans, Bacillus flexus and Exiguobacterium aurantiacum shown this increment at low concentrations.

**Conclusion & Significance:** In the iron smelting industry, identified bacterial strains can be harmful to health and even more if it is considered their resistance to tested metals.

## Biography

Daniellys Alejo Sanchez has experience in analysis of environmental samples. She completed her PhD in the of Antwerp University. This investigation was related to gaseous pollutants, their relationship with meteorological variables and adverse effects on human health. Nowadays, she is the director of the RIP project "Characterization and analysis of particulate compounds in multiple workplace atmospheres" which is developed between the University of Antwerp and the Universidad Central "Marta Abreu" de las Villas. The results showed in this presentation are being carried out in the framework of this project. They are very important because they represent one of the first studies made in workplace atmosphere in iron foundries in Cuba.

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