

Penicillium and Pleurotus Fungus-like Biocatalyst of Heavy Metals in Batteries

Martinez Becerril, Elizabeth (School: Escuela Preparatoria Oficial No. 109)

Sosa Mondragon, Sarahi (School: Escuela Preparatoria Oficial No. 109)

Batteries are essential for electronic devices and contain highly toxic metals for health and the environment. When batteries are no longer useful, they are usually thrown away, ending up in the garbage dump, soil, and water. Thus, they will become a toxic waste; its chemical components will be modified in the environment, bioaccumulate in animal and plant tissues causing heavy metal poisoning. The purpose of this project was to investigate the biocatalytic reaction of the fungi *Pleurotus ostreatus* and *Penicillium digitatum* on the metals of the batteries, allowing to be dragged with acids producing salts in the form of sulfates and chlorides of Fe, Zn, and Ni. The methodology for this project was conducted in 3 stages: First, the batteries were subjected to 7 treatments by fungal biocatalysis *Penicillium digitatum* and *Pleurotus ostreatus*, using as substrate: oranges, potato dextrose agar, and wheat peeling. The results showed the efficiency of the fungus *Penicillium digitatum* on the degradation of the body of the piles. After that, the downgraded pills by the fungi were subjected to the drag of metals with H_2SO_4 , the obtained salts were white, bone, yellow. Sulfate concentrations were (18,415.25 ppm) T3 (*Penicillium digitatum*, potato dextrose agar as substrate). Finally, the remnants were subjected to the dragging of metals with concentrated HCl, the obtained salts were greenish, and the concentration of chlorides was (8,963.75 ppm) T3. The results of this investigation were that biocatalyzed treatments with fungi produced 40 to 80% more sulfates and chlorides than the control group.