An effective biosorbent for the removal of Lead and Barium: A preliminary study

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Industrial effluent is a major environmental threat due to contaminant loads, especially of heavy metals. Removal of these heavy metals from the contaminated sites has been a never ending challenge as they are persistent in the environment and cause major health issues. In recent days, a biotechnological approach i.e., biosorption by microbes has gained importance over the conventional methods. Fungal organisms and agro waste materials have received increasing attention in recent days as a potential biosorbent. The cell wall components (cellulose, hemicelluloses, chitin or pectin) along with functional groups like hydroxyl, carboxyl and amino groups of these biosorbents serve as active metal binding sites. Six species of *Aspergillus*, *Penicillium* sp. and a *Trichoderma* sp., exhibited resistance to Barium up to 2000 mM by well diffusion method. A species of *Penicillium* and two species of *Aspergillus* showed resistance to Lead up to 2000 mM. An adsorbent was designed by growing *Aspergillus* or *Penicillium* sp., on a natural agro waste substance i.e., loofah sponge under shaken condition for 48 hours at 37º C in broth supplemented with nutrients. The adsorption of Barium and Lead on dried adsorbent (loofah disc with fungal mycelium) showed 95% and 99% respectively as shown by Atomic Adsorption Spectrophotometer (AAS) analysis. Adsorption capacity of the designed adsorbent was further confirmed by Fourier Transform Infrared Spectroscopy (FTIR) and X-rays Fluorescence (XRF) analysis.

Biography

Sriharsha D V has completed his Masters in Microbiology from the Department of Microbiology and Biotechnology, Bangalore University in the year 2013. He is currently pursuing his PhD in the field of Environmental Microbiology from the same department.

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