ARSENIC REMOVAL FROM DRINKING WATER USING AGRICULTURE/FOOD-INDUSTRY SOLID WASTES AS LOW-COST SORBENTS

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FUNDED BY

GRAND CHALLENGES CANADA

The results showed that modified biosorbents removed more arsenic from natural contaminated water samples than that of natural biosorbents in groundwater samples, with arsenic levels ranging from 5–201 μg/L. The influence of competing ions (such as sulfate, nitrate, phosphate, sodium, calcium and magnesium) was also resolved and it was observed that these competing ions did not have a significant effect on arsenic adsorption except phosphate, which reduced the adsorption of arsenic by 15 to 20%. Xanthation of corn cob enhanced the arsenic adsorption capacity by 1.9 times, while charred sugarcane bagasse and iron-coated sugarcane bagasse showed 2 and 1.5 times higher adsorption capacity, respectively, compared to natural sugarcane bagasse. Akaganéite-coated water chestnut shell showed 2 times more adsorption capacity than natural water chestnut shell. The project team plans to further evaluate the developed biosorbent technology to determine its usefulness in removing multi-contaminants (e.g., heavy metals and organic contaminants) from groundwater and/or industrial wastewater. Additionally, they plan to regenerate the biosorbents by applying various desorbing agents to reuse arsenic-contaminated water and recovered arsenic, which potentially can be used in high-technology manufacturing processes. The researchers wish to apply for Phase II Transition To Scale funding to scale up the project, as they seek support from the Water and Sanitation Agency (WASA), the Faisalabad and Environmental Protection Agency of district Faisalabad, and the Punjab Government in Pakistan to implement this innovative technology.