

Staphylococcus edaphicus KCB02A11 incorporated with natural adsorbents: first report on its tolerance and removal of hexavalent chromium [Cr(VI)]

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Abstract

Deteriorating the quality of different parts of the ecosystem due to toxic metals is a serious global issue. Hexavalent chromium is a metal that can cause adverse effects on all living beings, including plants, animals, and microorganisms, on exposure to high concentrations for prolonged periods. Removing hexavalent chromium from various types of wastes is challenging; hence the present study investigated the use of bacteria incorporated with selected natural substrates in removing hexavalent chromium from water. Isolated *Staphylococcus edaphicus* KCB02A11 has shown higher removal efficiency with a wide hexavalent chromium range (0.025-8.5 mg/L) within 96 h. Incorporating the isolated strain with natural substrates commonly found in the environment (hay and wood husk) showed high removal potential [100% removal with 8.5 mg/L of Cr(VI)], even within less than 72 h, with the formation of biofilms on the used substrates applied for metal removal on a large scale for prolonged periods. This study is the first report investigating hexavalent chromium tolerance and removal by *Staphylococcus edaphicus* KCB02A11.

Citation

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