

Title: Sugarcane bagasse as nutrient and support material for Cr(VI)-reducing biofilm

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Abstract: The high cost of culture growth medium is one of the problems faced in the scaling-up of biological processes involved in wastewater treatment. This makes it imperative to find a useful, cheap and easily available alternative source for culture growth medium. The present work highlights the use of sugarcane bagasse (SCB) to sustain the population of Cr(VI) reducing immobilized-biofilm system in a non-sterile condition. The locally isolated Cr(VI) reducing-resistant *Acinetobacter haemolyticus* was used as primary bacteria inside the sugarcane bagasse packed flow-through column and showed 92-99% Cr(VI) reduction ability during the adaptation stage using 10-100 mg/L of Cr(VI). During the column study, around 4 h (3.0 mL/min) was required to achieve complete reduction of 25 mg/L Cr(VI). The retention time increases with the increase in Cr(VI) concentration. The morphology of the immobilized cells was slightly changed in the presence of Cr(VI) as shown from the FESEM analysis. Phylogenetic analysis of the cultured bacterium from the biofilm samples suggested the dominance of *Chitinophaga terrae*, *Laribacter hongkongensis*, *Ottowia thiooxydans*, *Rhizobium cellulosilyticum*, Candidate division OP10, *Pedobacter* sp. as well as uncultured bacterium. Overall, sugarcane bagasse may be used as an excellent alternative and cost-effective growth medium for cultivation of *A. haemolyticus* as well as support material in a packed-bed Cr(VI) reduction system.