ABSTRACT

Industrial pollutants and trash collect in the soil, which functions as a sink because of their severe toxicity even at low concentration levels, heavy metal contamination in soil is one of the most important worldwide concerns of our day. Phytoremediation is more sustainable, eco-friendly and cost-effective strategy. Although phytoremediation has gained more attention among biological methods, toxicity of heavy metals affects plant growth and biomass adversely. Microbe assisted phytoremediation enhanced phytoextraction potential of plants. In this study, *Pararhizobium giardinii* sp. nov. was used. The goal of this study was to determine the remediation and phytoremediation capability of *Pararhizobium giardinii* sp. nov. and *Pisum sativum*. *P. giardinii* sp. nov. and *P. sativum* were given Cr doses of 0 mg/kg, 200 mg/kg, 400 mg/kg, 600 mg/kg, and 800 mg/kg. The experiment was conducted in the green house conditions provided in the botanical garden of Government College University, Lahore. Plant growth promoting rhizobacteria induced positive increase on plant length, leaf number, leaf surface area, root and shoot biomass. Chromium content absorbed by root in *P. sativum* was in dose dependent manner 53 mg/kg at 200 mg/kg, 75 mg/kg at 400 mg/kg, 115 mg/kg at 600 and 159 mg/kg at 800 mg/kg of chromium. The absorption of Cr content in shoot was low as 20 mg/kg, 50 mg/kg, 60 mg/kg and 73 mg/kg, at 200, 400, 600 and 800 mg/kg, respectively. While the chromium content absorbed by leaves have the value 52 mg/kg at 200 mg/kg, 101 mg/kg in 400 mg/kg, 132 mg/kg at 600 mg/kg and at the highest concentration of 800 mg/kg it was 129 mg/kg. *Pararhizobium giardinii* sp. nov. exhibited a considerable increase in percentage removal of Cr i.e., 66 % and 72% at 200 mg/kg at 15 days and 30 days of plant growth respectively. While at the concentarttion of 400, 600 and 800 mg/kg the removal ratio is 56.5%, 51.16% and 48.73%, respectively. Moreover, results indicated that *Pararhizobium giardinii* sp. nov. can effectively improve the rhizoremediation of Cr by pea plant. (Ctrl)