ABSTRACT

Heavy metal polluted soils have become more widespread around the world as geological and human processes are increased. Bioremediation is an efficient treatment strategy for heavy metal-contaminated soil-plant system. However, the effectiveness of this approach is greatly reliant on the organisms involved. The ability of bacteria to bioremediate alone and in combination with plants has been thoroughly researched and analyzed. Microorganisms such as *Klebsiella* and *Enterobacter cloacae* are enormous source of enhancing chelation effect that triggers bacterial response to stress applied according to the literature, and its positive outcomes as shown in this research. This study includes evaluating the effect of Lithium and Chromium (experimental projected stress doses were Li 50-200ppm and Cr 10ppm) in *Oryza sativa* in accordance to their concentration found in soil of Pakistan; as Chromium is 10mg/kg and Lithium of 200mg/kg. This projected study comprises analysis on soil-plant system (labelled as T1-T16 treatments) with physical and physiochemical parameters that affects the plant growth and development, which was performed in botanical garden of GCU, Lahore through pot experiment carried out for 2 months. Results of this study reflect that with increase in stress concentration (up-to 200ppm), there is subsequent decline in plant growth but those with bacterial inoculation were observed to be better in their developmental phase (Chlorophyll content up to 40, panicle numbers more than 13). This study suggests utilization of halophilic bacteria in soil to enhance plant performance, in order to boost our sustainable developmental agricultural system