Abstract

Heavy metal contamination has been a global concern lately. With rapid industrialization and uncontrolled urbanization, heavy metal concentrations in air, water, and soil have increased drastically. Metalloids such as Lithium are a contaminant that has the capacity to disturb plant's physiological and biochemical parameters up to dangerous levels. Chromium as a heavy metal is lethal for plants even present in a small amount. The main concern of this study was to evaluate the effects of Li (0 to 200ppm) and Cr (0 to 10 ppm) on maize (*Zea mays L.*) plants (a high-value ecological species) and the alleviation of their toxicity using metal-resistant bacterial strains (*Klebsiella variicola* and *Enterobacter cloacae*). Height, number of leaves, root and shoot weights, stomatal conductance, rate of transpiration, rate of photosynthesis, growth rate, protein content, phenolics content, and chlorophyll content were the variables used to investigate the effects of Li and Cr on this species. The concentrations of Li and Cr in the root and shoot of maize plants were also determined. In the wire house of the Botanic Garden, GCU, Lahore, pots containing three replicates of each treatment (T1 to T16) of maize were put in a pot experiment. The estimations of morphological attributes and gas exchange parameters were made every two weeks in the Botanic Garden with measuring tape, and IRGA instrument till harvesting. The concentration of lithium and chromium in roots and shoots of maize was measured using an Automatic Flame Photometer and Atomic Absorption Spectrophotometer respectively after harvesting. Roots and shoots were weighed both fresh and dry. The results revealed that as Li and Cr stress increased, all of the previously indicated physiochemical and growth parameters declined, but a significant increase was detected in treatments with bacterial inoculum. Such data can be useful for lithium and chromium remediation in crops.