

Abstract

The current research was carried out to determine the impacts of chromium tolerant bacteria (*Bacillus cereus*) on germination, growth, yield and physiological parameters of *Solanum lycopersicum* L. cv. Veloz to protect the plants from toxic effects of chromium. The effects of isolated bacteria (*Bacillus cereus*) were tested for germination and growth of tomato plants by treating the plants with five varying concentrations of potassium chromate stock solutions (50ppm, 100ppm, 150ppm, 200ppm and 250ppm) respectively. With increase in chromium stress, there was delay in germination, growth, yield and other physiological parameters as level of stress increased. When plants were grown without chromium resistant bacteria (*Bacillus cereus*), there was delay in germination, growth, yield and physiological parameters. The plants which were grown with chromium resistant bacteria (*Bacillus cereus*) showed increased germination, growth, yield and physiological parameters. At 250ppm, the germination percentage reduced to 43.72% as compared to control without bacterial (*Bacillus cereus*) inoculum. Similarly, all other parameters decreased with the increase in level of chromium without chromium resistant bacteria (*Bacillus cereus*). At 250ppm, the germination percentage reduced to 40.67% as compared to control with bacterial (*Bacillus cereus*) inoculum. Similarly, all other parameters increased with the increase in level of chromium with chromium resistant bacteria (*Bacillus cereus*). In case of growth, yield and physiological assessment, length of roots and shoots, fresh weight of roots and shoots, dry weight of roots and shoots, height, number of leaves, number of branches, number of flowers, number of fruits, rate of photosynthesis, transpiration rate, stomatal conductance, leaf area, fruit length, fruit weight, fruit diameter and ion contents under different concentrations of chromium decreased in plant seedlings without bacterial inoculum (*Bacillus cereus*) while increased in plants with bacterial inoculum (*Bacillus cereus*). The number of senescent leaves and heavy metal contents were increased under different chromium concentrations without bacterial inoculum (*Bacillus cereus*) while decreased with bacterial inoculum (*Bacillus cereus*). It was concluded that all studied parameters were greatly affected by increasing concentrations of chromium but their effect was ameliorated by using chromium tolerant bacteria (*Bacillus cereus*).