

ABSTRACT

Present study was carried out at the Botanic Garden of GC University, Lahore during 2008-rice-growth season with hexavalent chromium applied to potted rice plants (*Oryza sativa* L. cv. Basmati-Super) and by assessing its impact on growth performance, biomass, physiological & biochemical attributes. Chromium accumulation was also ascertained in shoots, roots, and seeds.

Chromium was applied at different rates to the soil in pots, e.g., 50, 100, 150, 200, 300, 400 and 500 mg/kg of soil in different treatments. Control treatment plants were grown in pots with normal field soil. Chromium has shown drastic impact on rice plants because it reduced plant height (9-47%), number of tillers (13-53%), and number of leaves (12-61%) compared to untreated plants. Senescence was found to be much higher in chromium-treated plants than that of the control ones. Chromium significantly reduced fresh weight of shoot (25-77%) and root (14-55%) with corresponding reductions in dry weights of shoot (14-71%) and roots (22-69%). Chromium severely affected physiological parameters viz., photosynthetic rate (6-56%), transpiration rate (5-58%), and stomatal conductance (21-66%). Some of the biochemical attributes like chlorophyll a, chlorophyll b, and total chlorophyll was also reduced in the range from 7-47%, 7-43%, and 77-41%, respectively. Carotenoid contents were reduced by 31-

50%. In addition, protein contents, phosphorous, and potassium was also significantly reduced by 7-47%, 7-43%, 7-41%, respectively. Chromium accumulation was extremely higher in shoots (2700-19150%), roots (208-5869%), and in seeds (21- 249%) of the treated plants as compared to control plants.

In summary, present extensive investigation has reported that chromium is injurious to every aspect of rice growth and its accumulation in above threshold concentrations in various plant parts and seeds is a matter of serious concern from viewpoint of human health.