

ABSTRACT

In the present study, effect of various levels of Cr (VI) was investigated on the Wheat (*Triticum aestivum* L.) Shafiq-2006. The Wheat plants were grown for their life cycle in the pots at the Botanic Garden of Government College University, Lahore. There was one control and seven Cr (VI) treatments, called as T0, T1, T2, T3, T4, T5, T6 and T7. Chromium was applied at different rates in pots to soil i.e. 1.556 g/kg, 3.112 g/kg, 4.66 g/kg, 6.224 g/kg, 9.335 g/kg, 12.447 g/kg, 15.569 g/kg of soil in various treatments. Control plants were grown without any addition of salt and grown in normal field soil. Cr has shown severe effects on wheat germination because % germination was reduced by 85%, seedling length by 91%, Plumule and radicle length reduced by 90 and 93% respectively. Seedling vigor index was reduced by 99%, tolerance indices by 91%, fresh weight of seedlings and dry weight of seedlings reduced by 99 and 91% respectively. Treatments containing higher concentration of Cr showed reduction in growth.

Plant height was reduced by 10-76% (T1-T7), number of tillers reduced by 14-100% (T1-T7), total number of leaves per plant reduced by 30-72% (T1-T7), rate of senescence was higher in the higher Cr treated plants than control. Cr significantly reduced shoot and root fresh weight i.e. 18-72% (T1-T7) and 11-89% (T1-T7) respectively. Dry weight of shoot and root reduced by 24-79% and 38-14% (T1-T7) respectively. Cr adversely affected on the physiological parameters viz., photosynthetic rate (10-86%), transpiration rate (8-68%), stomatal conductance (0-76%). Some of the biochemical attributes like chlorophyll a, chlorophyll b, and total chlorophyll was also reduced by 17-64%, 8-50% and 17-57% respectively. Carotenoid contents was also reduced by 8-59%. In addition N, P, K and proteins was also significantly reduced by 9-91%, 2-61%, 1-64% and 9-91% respectively. Cr accumulation was extremely high in shoots and roots 37-795%, 130-1173% respectively and in seeds 50-610% in Cr treated plants than control.

In short, present investigation has reported that Cr is injurious to every aspect of wheat growth and its accumulation in various parts of wheat especially in seeds is a matter of serious concern from viewpoint of human health.