ABSTRACT

The wastewater of Sitara Chemicals Ltd. Faisalabad was alkaline with high BOD and COD values along with much higher concentrations of total settleable and suspended solids, SAR and high sodium. Effluents were examined for its chemical nature, and effects of its various dilutions were extensively investigated using newly recommended two barley cultivars by growing them in pots for their whole life cycle in the Botanic Garden of G.C. University, Lahore during 2002-2003. Percentage of germination, pigments, carbohydrate and protein contents in one-week old seedlings of both barley cultivars showed a decreasing trend with increasing effluents concentrations. Effects of effluents concentrations proved phytotoxic in case of all parameters taken into practice.

Vegetative growth parameters viz., plant height, number of leaves and number of tillers per plant were extremely reduced with the increasing levels of effluents, while plants in lower treatments did not showed severe retardation of growth as compared to their counterparts from control. Senescent rate was higher in plants from higher treatment levels of both cultivars (Haider 93 and Jou-87) compared with plants of lower treatments, which were much healthier and better developed. Productivity of barley crop was highly reduced in the present investigation due to effluents concentrations in various parameters of reproductive growth i.e., ears per plant (49%), spikelets per ear (36-40%), seeds per ear (49%), seed weight per plant (61-66%), and 1000-seed weight (49-59%) at highest pollution concentrations for both the cultivars. Biomass production was also severely decreased in both the cultivars at higher doses. Overall the results are important for both academic viewpoint and agricultural research sector.