Phytotoxic effects of raw and treated tannery effluents on germination, growth and yield parameters of Cow pea [*V. unguiculata* (L.) Walp.]

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From National Conference on Interdisciplinary Research and Innovations in Biosciences, NATCON -2018. Post Graduate & Research Department of Biochemistry, Mohamed Sathak College of Arts & Science, Sholinganallur, Chennai-600119, India. 24th & 25th January 2018.

American J of Bio-pharm Biochem and Life Sci 2018 January, Vol. 4 (Suppl 1): **PP10**

ABSTRACT

Leather production is a major industry in India with significant foreign exchange earnings. Enormous amounts of water are discharged as effluent from leather industries. Tannery effluent (TE) is ranked as the highest pollutant among all industrial wastes. This study was carried out to characterize TE and investigate its effect on germination, growth and yield of *Vigna unguiculata,* (Cow pea), in raw (RE) and treated effluents (TTE). Effluent samples from highly polluted area of Ranipet, Vellore District, Tamilnadu, India were examined for physico-chemical properties. RE showed several fold increase in BOD and COD values along with increased level of pollution parameters compared to TTE. Several parameters are far greater than the permissible limits even in TTE. Cr, for instance, displayed a 16.6 fold decrease after treatment, but it is still 70 times higher than the permissible values. Chromium is a toxic heavy metal that causes serious life threatening damages to all organisms including plants. Exposure of seedlings to RE and TTE for 7 days exhibited significant Increase in Phytotoxicity(%) and reduction in germination%, shoot length, root length, biomass, Vigour index in RE than TTE exposed seedlings revealing the existence of variety of toxic substances especially Cr^{6+} in RE than TTE. Reduction in yield parameters such as number, size and weight of fruits also confirmed the influence of toxic substances that interfere the metabolic activities of seedlings under effluent stress. Thus, it is needed that tannery effluents should be properly treated to bring down their adverse effects within tolerable limits.

Published: February 2018.