

Summary

8. SUMMARY

- The release of industrial effluent / wastewater into the environment pollutes not only the irrigated soils but also affects the plants grown in these soils.
- Phytoremediation is the technology that uses plants to remove the contaminants from the contaminated site.
- *Crotalaria juncea* L. belonging to the family Fabaceae, is the experimental plant used in the study.
- Tannery effluent used for the study was collected from a tannery industry that uses chrome tanning process. The collected tannery effluent was used in the experiment as raw and diluted form.
- The earthworm, *Eisenia fetida*, was used for the collection of vermiwash. The collected vermiwash was applied as a foliar spray at a concentration of 10% and 20%.
- Twelve experimental setups with the combination of foliar spray (vermiwash and gibberellin) and soil drenching (water, raw tannery effluent and diluted tannery effluent) were used for the experiment.
- The present investigation has attempted to study the effect of vermiwash and growth promoter like gibberellin on different aspects of growth such as morphology, biochemistry, anatomy and genetic variations in tannery effluent-fed *C. juncea*.
- The Seed germination study shows higher seedling vigour index in T1V2 treatment (50% Tannery effluent (d) + 20% vermiwash (s)) and minimum in T2 treatment (100% Tannery effluent (d) + Deionised water (s)).

- Exo-morphological parameters such as plant height and intermodal diameter were high in G treatment (Water (sd) + 100 ppm Gibberellin (fs)) and low in T2 treatment (100% Tannery effluent (sd) + Deionised water (fs)) while number of leaves and leaf area were high in V2 treatment (Water (sd) + 20% Vermiwash (fs)) and low in T2 (100% Tannery effluent (sd) + Deionised water (fs)) and T2G (100% Tannery effluent (sd) + 100 ppm Gibberellin (fs)) respectively.
- Root growth, development of nodules, biomass and survival rate of the plants were very much affected in T2 treatment while they were not much affected in the plants subjected to V1, V2 and G treatments.
- The analysis of biochemical parameters shows higher chlorophyll content in the plants subjected to V2 treatment (Water (sd) + 20% Vermiwash (fs)) than the plants subjected to other treatments.
- The anatomical variations in stem and leaves of *C. juncea* that were fed with 100 % tannery effluent shows damage and distortion of tissues and some recovery is seen when they were subjected to foliar spray of 10% vermiwash.
- The RAPD analysis shows DNA damage in plants fed with raw tannery effluent.
- The results of growth parameters of the plants subjected to T1V1 treatment were very much like that of the control.
- By this study it can be concluded that the tannery effluent affected soil may be reclaimed by cultivation of *C. juncea* using vermiwash as a biofertilizer.
- Like flyash, the plants cultivated in the contaminated sites can be utilised for making bricks or can be utilised for making biofuel.