RESEARCH PAPER:

Influence of organic manures on microbial population of *Amaranthus* and *Brassica* species grown with magnesite mine spoil

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SUMMARY

The present study was concluded to evaluate the microbial dynamics of magnesite mine spoil. A pot culture experiment was laid out in the Department of Environmental Science, Tamil Nadu Agricultural University, Coimbatore. Results revealed that The bacterial, fungal and actinomycetes population were the highest in *Amaranthus* sp. grown in magnesite mine spoil with FYM, vermicompost and 100% NPK (21.2×10^6, 12.4×10^3 and 6.5×10^2 CFU g^{-1}, respectively). The increased and decreased microbial population was probably due to the availability of nutrient status in the spoil by the addition of organic amendments.

Key words : Organic manure, *Amaranthus* sp., *Brassica* sp., Magnesite mine spoil.

The success of phytoremediation depends upon the selection of plant species and soil amendments that maximize the removal of heavymetals from the top layer of contaminated soil. At the same time, amendment of contaminated soils with lime, phosphate and organic acids generally reduce the bioavailability of heavy metals (Khan *et al.*, 2000). Purkayasitha and Menon (1999) reported that incorporation of organic residues in low organic soil influence the various soil biological activities leading to enhancement of plant growth. The addition of peat and manure increase Cu, Zn and Ni accumulation by wheat (Narwal and Singh, 1998) and also facilitate the plant growth in poor soils, providing a higher nutrient and water supply to the crops. Selvam and Lourduraj (1998) recorded that the organic matter influence soil productivity by influencing soil physical, chemical and biological properties.

MATERIALS AND METHODS

An experiment was laid out in the Department of Environmental Science, Tamil Nadu Agricultural University, Coimbatore to evaluate the rhizosphere microbial population of *Amaranthus* sp. and *Brassica* sp. grown with magnesite mine spoils. The treatment details are as follows.

T_1–Magnesite mine spoil + *Amaranthus* sp. + 100% NPK, T_2–Magnesite mine spoil + *Brassica* sp. + 100% NPK, T_3–Magnesite mine spoil + FYM + *Amaranthus* sp. + 100% NPK, T_4–Magnesite mine spoil + FYM + *Brassica* sp. + 100% NPK, T_5–Magnesite mine spoil + Vermicompost + *Amaranthus* sp. + 100% NPK, T_6–Magnesite mine spoil + Vermicompost + *Brassica* sp. + 100% NPK, T_7–Magnesite mine spoil + FYM + Vermicompost + *Amaranthus* sp. + 100% NPK, T_8–Magnesite mine spoil + FYM + Vermicompost + *Brassica* sp. + 100% NPK

Replication : 3; Design : Factorial Completely Randomized Block Design (FCRD)

Soil samples were collected from the pot culture experiments at different stages of crop growth *viz.*, post germination (five and four days for *Amaranthus* and *Brassica* species, respectively), 45th day and post harvest stage and used for analyzing microbial population. Soil microbial population of different treatments were enumerated by the following standard plate count method using appropriate media for bacteria, fungi and actinomycetes as given below :

Sr. No.	Organisms	Medium	References
1.	Bacteria	Nutrient glucose agar	Allen (1953)
2.	Fungi	Potato dextrose agar	Riker and Riker (1936)
3.	Actinomycetes	Ken Knight's agar	Rangaswami (1966)

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