

SESSION VII: SUSTAINABLE AGRICULTURAL PRACTICES

**BIOLOGICAL AND CHEMICAL PROPERTIES OF “VERMIWASH”,
A NATURAL PLANT GROWTH SUPPLEMENT FOR TEA, COCONUT
AND HORTICULTURAL CROPS**

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Earthworms have been well exploited in agriculture worldwide in maximizing crop production for many years. Amongst vermin-technology (Vermitech) practices, Vermiwash (Vw) has shown its field efficacy with many crops. Vw is the wash of earthworm's celomic fluid and calcareous layer and the watery extract of the bedding materials, which is known to contain ample amounts of soluble macro and micronutrients, natural growth hormones, beneficial microbes, vitamins and amino acids etc. and nematicidal properties. However, the attributes to beneficial agronomic values of Vw have not yet been scientifically validated fully although this practice is extensively being expanded in India and Sri Lanka. Therefore, the present study investigated the biological and chemical properties of eleven sources of Vw resulted from different earthworm species and raw materials in different farms in Sri Lanka. Vw was tested as a source for hydroponics for lettuce in comparison with the Albert solution. The efficacy of regular foliar and soil applications of Vw on bush bean (Variety: Top crop), tomato (Variety: Thilina), nursery tea (cultivar: TRI 4071) and coconut (Variety: DxT) was also evaluated in comparison with vermicompost and conventional chemical inputs in a series of bioassays.

The results of analyses revealed varying levels of biological and chemical properties of the test samples but within the optimal range for plant growth. Vw exhibited significantly lower levels of N, P, K but was rich in Ca, Mg, Zn, Fe and Mn; pH and CEC were also in the required ranges. Vw significantly ($p=0.05$) influenced the soil microbial biomass although individual microorganisms were not identified; microbial biomass of Vw and control were estimated as 4.95 and 3.20×10^{-3} mg CO₂/day/25g soil respectively. Vw proved as a better alternate source to Albert solution for lettuce growth under hydroponic culture. The root length, root and shoot biomass and total leaf area of bush bean were significantly ($p=0.05$) affected by Vw application compared to that of vermin-compost and synthetic

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fertilizer treatments. In nursery tea, *Vw* application lead to comparatively greater callusing of tea cuttings but the increase in root formation and shoot growth was not significant. *Vw* application boosted growth of coconut seedlings. However, no positive responses were seen with tomato.

The data suggested the potential exploitation of *Vw* in home gardening, indoor and container planting, biodynamic and organic farming etc. as a farmer friendly, culturally sensitive and economically viable natural product. Further work on attributes to plant growth such as determination of growth hormones, different doses and mass production of uniform quality *Vw* using different earthworm species and raw materials etc. would strengthen its sustainable use as an alternative growth supplement.