
Rapid Decomposition of Refuse Tea Using Dilute Alkaline Solution of Humate

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Refuse tea is a byproduct of tea manufacture. Generally 4-12% of refuse tea is produced in every tea factory and this amount could be even more depending on the standard of the leaf received and the type of processing carried out, at the factory. The estimated refuse tea production in the country is about 12-36 million kg yr⁻¹ and reported incidences are available on the abuse or misuse of refuse tea for fraudulent activities.

The use of refuse tea for mulching and composting is an acceptable and known practice in Sri Lanka. Traditional composting methods are passive (unregulated) and require longer period for the decomposition of the material for it to be suitable for application to the field.

A rapid method to decompose refuse tea by treating with an alkaline media (0.025 – 0.05M NaOH, KOH or NH₄OH), containing 3% Humate was found to be effective. The alkaline media extracts the soluble organic materials such as fulvic acids, amino acids and polyphenols and increase the soluble organic carbon (C) and nitrogen (N) fraction in the soluble fraction of the product. The remaining non-soluble fraction of the alkaline treated material also contains C and N with a C/N ratio of about 30, which is ideal for further decomposition of the material by microbes and make the conditions conducive to minimize gaseous losses of N as ammonia (NH₃). The end product is devoid of any unpleasant odour and causes no phytotoxic effects owing to the detoxification of organic pollutants by humic substances. It was found that the humic like substances are formed in the product very quickly due to bio-condensation and it increased appreciably with time compared to control treatment. The cation exchange capacity (CEC) of the composted material and the humic substances in the same, was 82 and 540 meq/100 g respectively. The compost contained appreciable amount of macro and micro nutrients too.

The treated material could be applied to the field by broadcasting soon after treatment. Field trials, conducted at Raigam Estate, Bulathsinhala showed that application of refuse tea compost at the rate of 5 mt ha⁻¹ has increased the mean yield of made tea by 648 kg ha⁻¹ over the control treatment. The labour and material cost of treating refuse tea is approximately Rs 1.30/kg. However, if the price of refuse tea is assumed as Rs 7.00/kg, then the cost per kg of the composting material is Rs 3.63.