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SEASONAL VARIATION OF PHYSICO-CHEMICAL CHARACTERISTIC STUDIES OF THE TUTICORIN CORPORATION WASTE DUMPING SITE AGED SOIL

***Govindarajan, B.**

Department of Zoology, VHNSN College, Virudhunagar-626001

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ABSTRACT

Seasonal variations in municipal solid waste dumping site aged soil of Tuticorin were studied. Samples were collected at Tharuvaikulam compost yard 12 kms away from Tuticorin. pH, Ec(dSm-1), macronutrients (N,P,K) and micronutrients (Fe, Mn, Zn, Cu) contents were analysed in corporation solid waste dumping site aged soil samples. The present research analysis various nutrients of aged soil due to this we give the suggestion to corporation to recycle the corporation solid waste through vermin technology and save the soil fertility of agri fields.

INTRODUCTION

Corporation solid waste management is a big problem in Tuticorin. It is a big challenge all over the Tuticorin corporation area limit, for corporation. Solid waste increases the soil organic matter. Organic waste can provide nutrients for increased plant growth and such positive effect will likely encourage continued land application of these wastes (Anikwe & Nwobodo 2001). Hence, the present research is aimed to determine the physico chemical element concentration in Tharuvaikulam compost yard aged soil.

MATERIALS AND METHODS

Study Area

Tuticorin Corporation has Compost yard at Tharuvaikulam 12 kms away from Tuticorin (www.municipalities.tn.gov.in). Soil collection site named as S1, S2 and S3 (Table 1).

Soil Sampling

Sampling is the important stage in physico-chemical analysis of municipal solid waste dumping yard aged soil. The objective of aged soil sampling is to obtain a small portion of the sample that accurately represents the characteristics of the study area being sampled. Aged soil sample collection locations were fixed previously. The seasonal variation survey of aged soil was conducted around Tuticorin Corporation solid waste dumpsite area from 2011 to 2012. Three samples of aged soil were collected in each season (post-monsoon, summer, pre-monsoon and monsoon). All samples are coded. For aged soil samples the codes are given as S1 to S3. Three aged soil samples were collected in and around the compost site. Aged soils were collected from three different sites in the compost yard at Tharuvaikulam. Aged soil samples were collected from the top 15 cm layer of the sampling stations. Prior to collection, top layer soils were hand sorted and plant materials as well as litter were carefully removed from the soil. About 750 g of aged soil were taken in individual polythene bags from three sites. Each soil sample was placed in well labeled sterile polyethene bags.

Laboratory Analysis

The physico-chemical composition of the aged soil was analyzed, from Kovilpatti agriculture soil testing laboratory.

DISCUSSION

Municipal solid waste dumping site aged soil was characterized for both micro and macro nutrients parameters. Results are shown in Table 1. Test results showed that municipal soild waste dumping site aged soil is highly

***Corresponding author:** Govindarajan, B.*
Department of Zoology, VHNSN College, Virudhunagar-626001

Table 1. General Physico-Chemical characteristics of Tuticorin Corporation waste dumping compost yard soil monthly from September-2011 to May-2012

Month-Year	Site no	Micronutrients (ppm)				Macronutrients (kg/acer)		
		Fe	Mn	Zn	Cu	N	P	K
Sep-2011	S1	2.06	0.91	13.13	0.29	90	8.4	500
	S2	6.96	0.17	24.70	0.48	98	14.2	460
	S3	3.19	0.37	13.16	0.14	134	11.8	340
Oct-2011	S1	6.77	0.24	21.84	0.23	172	11.8	205
	S2	4.51	0.82	19.42	0.24	106	10.0	360
	S3	5.45	1.24	18.38	0.25	84	9.0	510
Nov-2011	S1	2.44	3.33	1.19	1.23	115	9.5	420
	S2	2.48	3.34	1.19	1.29	162	7.4	450
	S3	2.38	3.35	1.13	1.29	172	9.0	500
Dec-2011	S1	5.41	1.96	10.12	0.23	118	7.4	285
	S2	5.23	1.81	12.30	0.25	98	6.8	500
	S3	6.05	1.81	10.28	0.26	151	7.4	205
Jan-2012	S1	6.12	1.84	11.76	0.38	95	5.8	500
	S2	5.97	1.79	12.50	0.26	137	6.8	500
	S3	5.70	1.80	12.03	0.31	140	7.4	500
Feb-2012	S1	6.78	1.94	12.12	0.44	137	12.4	500
	S2	7.04	1.63	11.17	0.53	126	10.1	500
	S3	7.12	1.85	11.83	0.64	134	13.0	500
Mar-2012	S1	7.84	1.76	12.10	0.68	131	13.6	500
	S2	6.94	1.86	11.84	0.55	120	11.2	500
	S3	7.10	1.75	12.13	0.81	129	10.7	450

notarized with macro and micro nutrients. In India farmers mostly depend on chemical fertilizers. Due to this we loss the soil fertility in the other side municipal solid waste become a waste for a long time. So we an attempt has been made to study on macro and micro nutrients in aged soil samples collected from in Tuticorin. Nitrogen, phosphate and potassium content of the organic matter is 0.73%, 0.93% and 0.35% respectively. These values indicates that the organic matter from city waste may stand as a great potential source of nutrients for crops if used as a fertilizer through composting (Sharholy et al 2007). So it may be useful as compost instead of chemical fertilizers. All the recorded minerals (micronutrients Fe, Mn, Zn and Cu) and metals (Co, Ni, Cr etc) in waste soil samples were 30-80 folds higher than garden soil (Shirbhate Nayana & Malode 2012). Many factors influence the micro and macro nutrients of the waste dumping site soil. The addition of municipal solid waste compost to agricultural soils has beneficial effects on crop development and yields by improving soil physical and biological properties (Zheljazkov & Warman 2004). Therefore, from the present investigation we can conclude that municipal solid waste dumping site aged soil containing higher amount of micro as well as macro nutrients which may useful to agricultural field instead of fertilizers.

Fig: Tuticorin Corporation Compost Yard
Compost yard area

Fig: Soil sampling

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