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UPGRADATION OF SALINE SOIL BY PHERETIMA SPECIES OF LAKHUWALI HEAD HANUMANGARH, RAJASTHAN, INDIA

Jaswant Singh*, H.K. Singh, B.S. Parmar
* Department of Chemistry, Tantia University,Sri Ganganagar Rajasthan, India

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ABSTRACT

Vermicompost is very necessary to full fill the high demand in agriculture field. It is challenging condition to grow plant in saline area at Hanumangarh. The low marginal content are found in saline soil Lakhuwali head Hanumangarh pH =8.20, EC=5.41 (Ds/m) OC= 0.15%, P =20 (Kg/ha), K=750 (Kg/ha). After treated the value add content – P^H=7.86, EC=4.43 (Ds/m), OC= 0.19%, P=29 (Kg/ha), K=775 (Kg/ha). The value add vermicompost by Pheretima compost content of saline soil OC=+ 0.4%, P=+9(Kg/ha), K=+25 (Kg/ha).There are R^2_{nt}= 0.02 and R^2_t= 0.058 in this present research. This technique may be useful in saline area.

KEYWORDS: Vermicompost, Pheretima, Saline soil, Renewable Biomass.

INTRODUCTION

The vermicompost is essential useful in the agriculture production. The increasing population and demand of food supply are responsible to manage the agriculture product. There are being using pesticides and fertilizers at large scale in agriculture field so its negative aspects have been bearing by human being so there is good need to use of vermicompost in saline area to increase productivity of agriculture product. The agricultural residues [1] is useless as agriculture side product .The most of them are burned and destroyed in an inefficient way. These side products are used in the formation of vermicompost to increase value added content of saline soil. The saline soil has source of salt and including metallic element. There are toxic elements in saline soil in which arsenic are present in this saline area. The arsenic has toxic nature to the production of red, white blood cells [2] and abnormal heart rhythm. The application of raw organic wastes is not useful due to their unknown composition pathogens, toxic compounds, weed seeds, heavy metals. The Composting is technique associated with organic solid [3], waste materials of agricultural by product .The Composting is a biological decomposition process by using Pheretima in composting formation the stabilization of organic substances [4] are fixed to use in germination of seeds. The weeds may be beneficially applied to crops. It is important nowadays to provide the much needed organic matter. The scope and potential for recycling of agriculture [5] take place by formation of vermicompsts at standards level.

The source of renewable [6] is present as biomass in agriculture and the huge amount of crop residues are available in India. The saline water [7] may be used in the reduction of crop yield. The basic water may deteriorate the physical properties of the soil with production of crop yield.

SAMPLE COLLECTION AND SELECTION

The sample selection was first need to take place research work for saline soil. I attempted to visit nearby Hanumangarh saline area of north Rajasthan. I visited six place of saline area which was tabulated in Table1 and represented in Fig. 1.

Table 1 Distance of sample place from Head Quarter, IGC, and Gagar River Climate= Hot and Arid, Moisture =medium, Erosion= Wind and Water, Lend view= Salticurst

S.No.	Sample place	Distance from Ditrict Head Quarter km	Distance from IGC km	Distance from Gagar River km
1	Sangitawali, Sri Ganganagar	75	10	15
2	1KSR , Sri Ganganagar	60	22	12
3	Badopal, Hanumangarh	40	20	15
4	1 KWD ,Hanumangarh	33	03	25
5	Lakhuwali Head, Hanumangarh	30	02	33
6	Mainawali Head, Hanumangarh	24	07	26

I took six sample 2 kg each from various saline place in region of Gager River and IGC. Initially the collected sample was dried up in open air environment. Later on the reference sample was formatted by mixing of all average weight of sample and the soil data has been tabulated in Table 2 and represented in Fig 2.

Table 2 For nontreated saline soil parameter of Hanumangarh district Climate= Hot and Arid, Moisture =medium, Erosion= Wind and Water, Lend view= Salticurst.

S.No.	Sample place	P^H	EC (ds/m)	OC %	P (kg/ha)
1	Sangitawali , Sri Ganganagar	9.89	16.42	0.15	17.6
2	1KSR, Sri Ganganagar	7.89	14.85	0.15	23.0
3	Badopal, Hanumangarh	7.93	12.42	0.14	16.8
4	1 KWD, Hanumangarh	7.62	15.42	0.14	18.00
5	Lakhuwali Head, Hanumangarh	8.60	05.41	0.15	20.00
6	Mainawali Head, Hanumangarh	8.45	14.98	0.15	17.00

P= Phosphorous, EC= Electro Conductivity, OC= Organic content.

EXPERIMENT

The formation of compost was taken place by use of Pheretima compost .at initially the 500 gm of dry saline soil was replaced on a under a shadow place. It was mixed with 100 gm of sheep's dag and thoroughly mixed up to prepare homogenous mixture. in successive order the 100gm *Boerhavia Diffusa* body part , 80gm leaf of Sisum ,50gm *capcicum annuum* body plant , 20gm of coal ash,30 gm cactus were mixed by manually now the to increase the 120gm tap water mixed in mixture. This mixture was treated by 10 Pheretima for 25 days under shadow condition. After 25 days the mixture was sieved and used for analysis. The results are tabulated in table 3.

Table 3 For treated saline soil parameter of Hanumangarh district Climate= Hot and Arid, Moisture =medium, Erosion= Wind and Water, Lend view= Salticurst.

S.No.	Sample place	P^H	EC (ds/m)	OC %	P (kg/ha)
1	Sangitawali, Sri Ganganagar	8.00	16.08	0.14	17.8
2	1KSR, Sri Ganganagar	7.79	13.85	0.15	24

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3	Badopal, Hanumangarh	7.90	13.30	0.14	16.90
4	1 KWD, Hanumangarh	7.60	13.65	0.15	18.50
5	Lakhuwali Head, Hanumangarh	7.86	4.43	0.19	29.00
6	Mainawali Head, Hanumangarh	8.40	14.07	0.15	17.08

P= phosphorous, EC= Electro Conductivity, OC= Organic content.

Table 4 For treated saline soil parameter of Hanumangarh district Climate= Hot and Arid, Moisture =medium, Erosion= Wind and Water, Lend view= Salticurst.

Sample place	P^H for nontreated	P^H for treated	EC (ds/m) for nontreated	EC for treated	P (kg/ha) for nontreated	P (kg/ha) for treated
Sangitawali, Sri Ganganagar	9.89	8.00	16.42	16.08	17.6	17.8
1KSR, Sri Ganganagar	7.89	7.79	14.85	13.85	23.0	24
Badopal, Hanumangarh	7.93	7.90	12.42	13.30	16.8	16.90
1 KWD, Hanumangarh	7.62	7.60	15.42	13.65	18.00	18.50
Lakhuwali Head, Hanumangarh	8.60	7.86	05.41	4.43	20.00	29.00
Mainawali Head, Hanumangarh	8.45	8.40	14.98	14.07	17.00	17.08

The comparative study of soil parameter of treated and non-treated saline soil was tabulated in table 4 in which observed that the plant nutrient phosphorus increased under treatment of process.

RESULTS AND DISCUSSIONS

The reference sample of saline soil has a characteristic soil parameter due to presence of salt. The sample was collected from saline area of Hanumangarh district near by the Gager River and IGC.
The distance of sample sport from Gager River and IGC has been represented in Fig.1

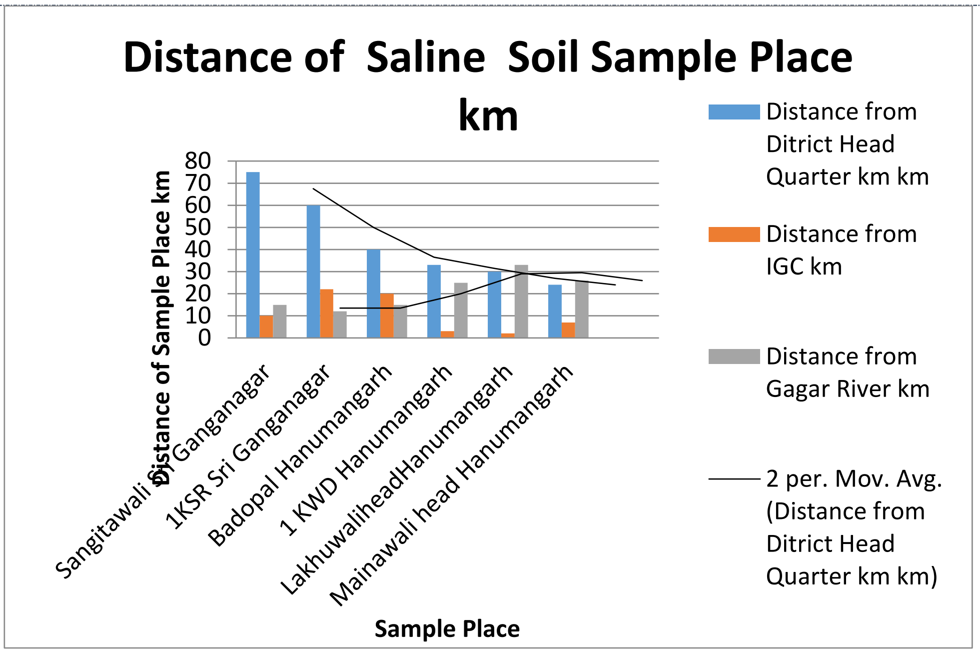
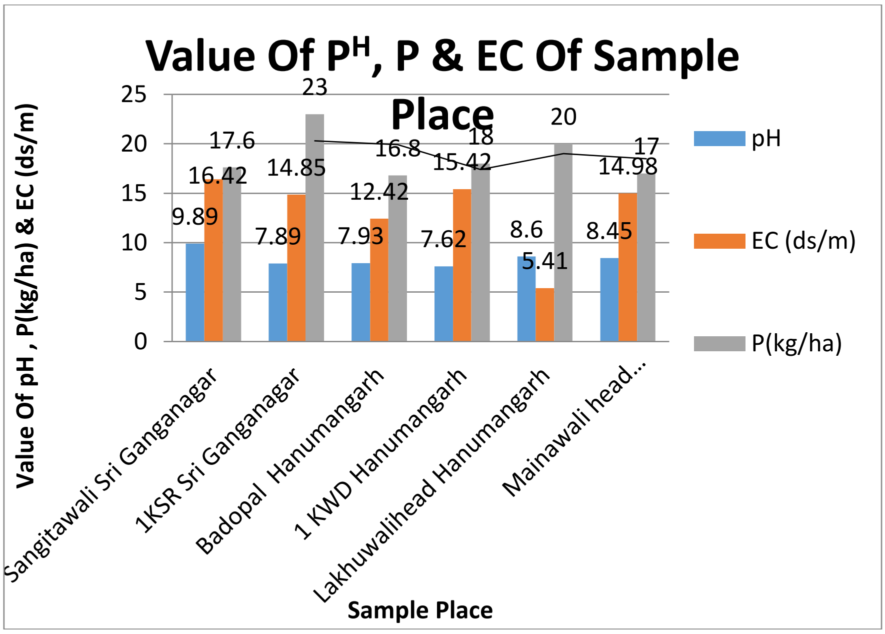


Fig. 1 Representation of distance of sample place

The sample of saline soil is of salty nature. It is analyzed by chemically and recorded in table 2. It is observed that the saline soil sample has high pH value and low content of phosphorus the value of soil parameter are represented in Fig. 2 there are toxic element also present in saline soil water. The fluoride is toxic element for human being which may be removed by vermicompost formation. Saline water is a major source of fluoride. Fluoride is the major inorganic pollutant of natural origin found in high levels.



P= Phosphorous, EC= Electro Conductivity.

Fig.2 Representation of the saline soil parameter for basic sample

In the formation of vermicompost the beneficial soil parameter are noted in table3 and represented in Fig 3 it is observed that the P^H decrease and phosphorus increase in the culture of vermicompost.

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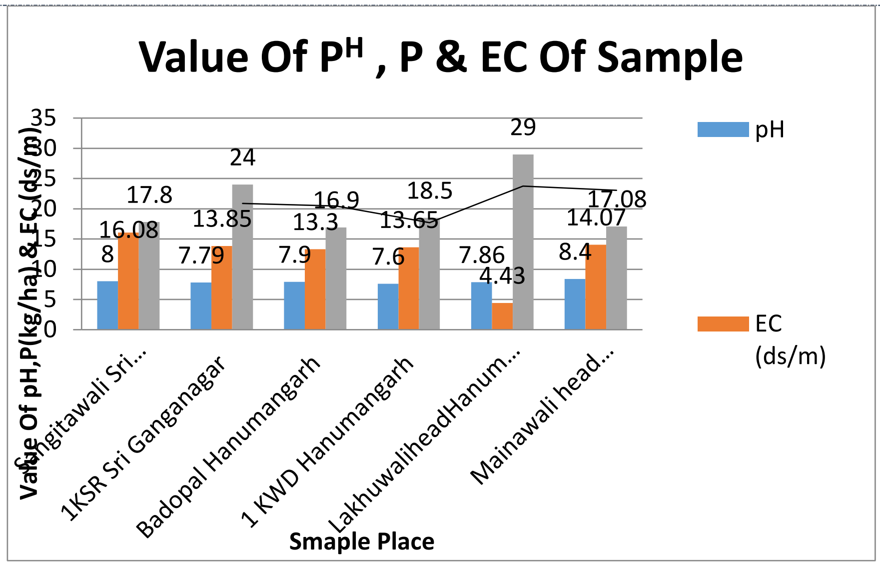
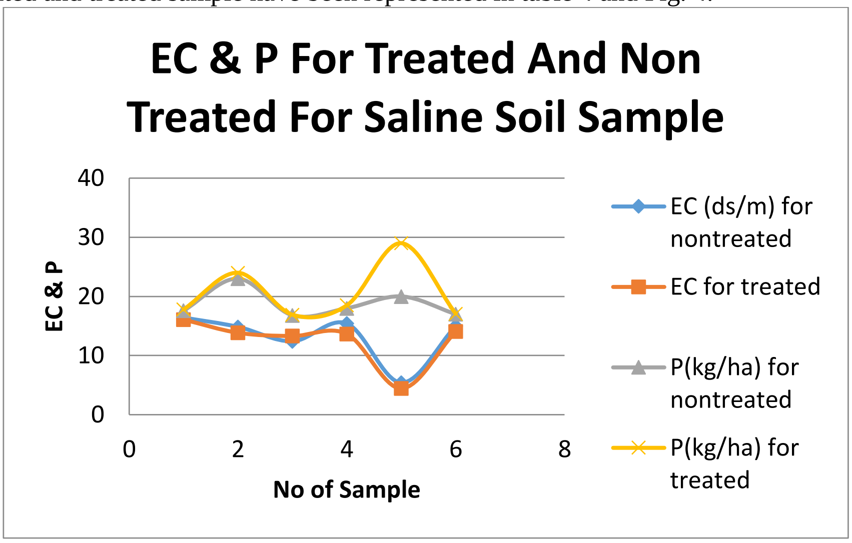


P= Phosphorous, EC= Electro Conductivity.

Fig.3 Representation of the saline soil parameter for treated sample

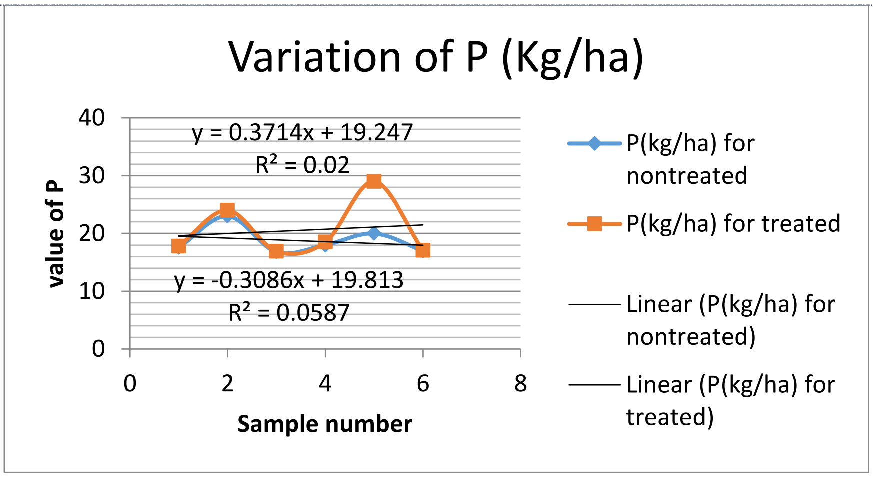
In the vermicompost formation is used as value added product in agriculture field the relative change of soil parameter of non treated and treated sample have been represented in table 4 and Fig. 4.



P= Phosphorous, EC= Electro Conductivity.

Fig.4 Representation of the comparative saline soil parameter for treated sample

By the regression study the value of R^2 is studied out in which $R^2_{nt} = 0.02$ and $R^2_t = 0.058$ in this present research. The comparative saline soil parameters for treated and non-treated sample have been represented in Fig. 5.



P= Phosphorous, nt= non-treated, t= treated
Fig.5 Representation of the comparative saline soil parameter for treated sample

CONCLUSION
There are noted in vermicompost culture that the value added content of saline soil is increased under this mechanism. As value added product the P= +0.2kg/ha increase pH = - 1.89 decrease in vermicompost formation of Sangitawali.

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