Advances in Aeronautical Science and Engineering
ISSN: 1674-8190

DESIGNING EFFICIENT COMPOSTING SOLUTIONS FOR COMMERCIAL KITCHEN WASTE MANAGEMENT

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ABSTRACT

Solid waste management (SWM) is worldwide problem and it is becoming more & more difficult day by day due to rise in Population, Industrilization, and change in our life style . Kitchen waste can be easily decomposable. The conversion of kitchen waste into value Population explosion rapid indutrilization and trend of urbanization have resulted in massive migration of pepole from rural to urban area as a result 100of tonnes of waste are being geerated. added is of more importance and on the other hand it controls a pollutents. The Nitrogen , Potassium Phosphorous, Moisture Content, Organic,Carbon& C:N Ratio was analyzed.

In the past few years there has been tremendous increase in foodwaste generation due to rapid urbanization and industrilization. Populatjon is also increasing and is accepected to reach 9.5billion by 2050.Both of these factor have put an emphasis to employ novel techiniques for management of waste generated so that waste generation could be reduced to a minimum or these waste could be convereted in some valuable product.

The aim of these work was to test combination of different additives with kitchen waste to improve the treatment efficiency and assess the optimum period required in each method to produce good quality compost. A 35 days composting helped in mass reduction moisture management, and pathogen reduction . Diffeeent additives gives different values of the nitrogen, phosphorus, potassium, moisture content,C/N ratio,etc.T hese tests helps more for management and use of kitchen waste as compost

1. INTRODUCTION

Municipal Solid Waste (MSW) includes commertial, Institutional, Industrial, Agricultural. The production of kitchen waste significantly increases along with the development of Restaurant, Industry as well as increase in consumption in India. More than 90% of MSW wastes were sent for unscientific landfilling creating problems to oublic health and environment .From MSW the kitchen waste can be decomposed easily ,Hence management of kitchen waste reduces or eliminates adverse impact on land contamination or pollution of soil and water.

Improper handling of solid wastes health hazard and cause damage to the environment. The main risk to human health arises from the breeding of disease vectors like flies, mosquitoes and rodants. Solid wastes are ideal breeding places for pathogens . Improper disposal of solid waste has resulted contamination. The environmental damage cause by wastes us mostly aesthetic in nature. Uncontrolled dumping destroys the beauty of country. There is danger of water pollution when the leachate from a refuse dump enters surface or ground water resources. Uncontolled burning of open dumps can cause air pollution.

Composting us a biochemical process in which organic material are biologically degraded, resulting in the production of organic by products and energy in the form of heat .Heat is trapped within the composting mass, leading to the phenomenon of self heating that is characteristic process.

It is ideal way to recycle organic wastes from our home and community .compost will provide nutrients to the plants not only nitrogen , potassium and phosphorus, but also the secondary and trace elements.

2. Materials And Methods

Collection of material -

The cowdung (25 days old)was procured from nearby dairy farm. The moisture content was maintained at about 40-70%. The kitchen waste procured from 1 Apartment and 3 Hotels in Gadhinglaj city. The waste was cut into small pieces by using kitchen waste shredded.

The earthworms are collected from vermicompostcentre located in hirlge village in GadhinglajTaluka .

3. EXPERIMENTAL SETUP

4 Sets of experiments were conducted .

In each set 3 seperates tests based on weight variation are conducted. The ratio of kitchen waste to the additive is kept as 1:0.5 , 1:0.075 , 1:1 .

Pre decomposition experiment –
The plastic bags of size 12' x 4' x 4' was filled with a mixture of different additives ratio with kitchen waste . It was daily sprinkled with water so that it gets decomposed. Also this waste was turned up and down for proper aeration and decomposition experiment continued for 45 days.

Composting Experiments –
In this study the 12 plastic bags were taken . The composition for composting is made as follows –

The names are given to the bags as per its additives –
Kitchen Waste + Cowdung
Kitchen Waste + Cocopeat
Kitchen waste + Compost Maker
Kitchen Waste + Vermicompost

In each bag as per the additives,the ratio of KW to additives is kept in ratio 1:0.50 , 1:0.75 , 1:1 . The bags are kept under the shade . The whole setup was maintained for 45 days till the finely granular compost.

During composting process the material was analyzed for different Physio-Chemical attributes such as PH , N , P , K , Micro-organisms,C/N ratio.
The Moisture content is analyzed by using Gravimeteric Method.
The Nitrogen Content is analyzed by using Kjeldahl Method.
The Phosphorous is analyzed by using Gravimetric Quinslinium Phosphomolybdate Method.
Potassium is analyzed by Gravimeterically Method.

4. RESULT

Kitchen waste +Cowdung

RATIO 1:1	PH	N	P	K	O.C
7 DAYS	6.04	0.24	0.31	0.21	45.90
21 DAYS	6.54	0.36	0.72	0.32	31.42
35 DAYS	7.21	0.89	1.28	0.54	22.14

Kitchen waste+cocopeat

RATIO 1:1	PH	N	P	K	O.C
7 DAYS	5.94	0.32	0.22	0.20	56.14
21 DAYS	6.36	0.49	0.45	0.26	49.11
35 DAYS	6.94	0.92	0.72	0.39	36.17

Kitchen waste +soil +earthworm

RATIO 1:1	PH	N	P	K	O.C
7 DAYS	6.41	0.21	0.34	0.16	40.14
21 DAYS	6.94	0.39	0.47	0.30	31.11
35 DAYS	7.23	0.75	0.98	0.42	20.16

Kitchen waste+compost maker

RATIO 1:1	PH	N	P	K	O.C
7 DAYS	5.81	0.31	0.39	0.23	42.19
21 DAYS	6.19	0.53	0.58	0.39	30.12
35 DAYS	6.79	1.06	1.64	0.69	19.11

Kitchen waste +Cowdung

RATIO 1:0.75	PH	N	P	K	O.C
7 DAYS	5.90	0.19	0.26	0.16	43.69
21 DAYS	6.04	0.31	0.67	0.27	29.92
35 DAYS	6.71	0.84	1.23	0.49	20.64

Kitchen waste+cocopeat

RATIO 1:0.75	PH	N	P	K	O.C
7 DAYS	5.40	0.27	0.17	0.15	54.64
21 DAYS	5.86	0.44	0.40	0.21	47.61
35 DAYS	6.44	0.87	0.67	0.34	34.67

Kitchen waste +soil +earthworm

RATIO 1:0.75	PH	N	P	K	O.C
7 DAYS	5.91	0.16	0.29	0.11	38.64
21 DAYS	6.44	0.34	0.42	0.25	29.61
35 DAYS	6.73	0.7	0.93	0.37	18.66

Kitchen waste+compost maker

RATIO 1:0.75	PH	N	P	K	O.C
7 DAYS	5.31	0.26	0.34	0.18	40.69
21 DAYS	5.69	0.48	0.53	0.34	28.62
35 DAYS	6.29	1.01	1.59	0.64	17.61

Kitchen waste +Cowdung

RATIO 1:0.50	PH	N	P	K	O.C
7 DAYS	5.40	0.14	0.21	0.11	42.19
21 DAYS	5.54	0.26	0.62	0.22	28.42
35 DAYS	6.21	0.79	1.18	0.44	19.14

Kitchen waste+cocopeat

RATIO 1:0.50	PH	N	P	K	O.C
7 DAYS	4.94	0.22	0.12	0.10	53.14
21 DAYS	5.36	0.39	0.35	0.16	46.11

35 DAYS	5.94	0.82	0.62	0.29	33.11

Kitchen waste +soil +earthworm

RATIO 1:0.50	PH	N	P	K	O.C
7 DAYS	5.41	0.11	0.24	0.07	37.14
21 DAYS	5.94	0.29	0.37	0.20	28.11
35 DAYS	6.23	0.65	0.87	0.32	17.16

Kitchen waste+compost maker

RATIO 1:0.50	PH	N	P	K	O.C
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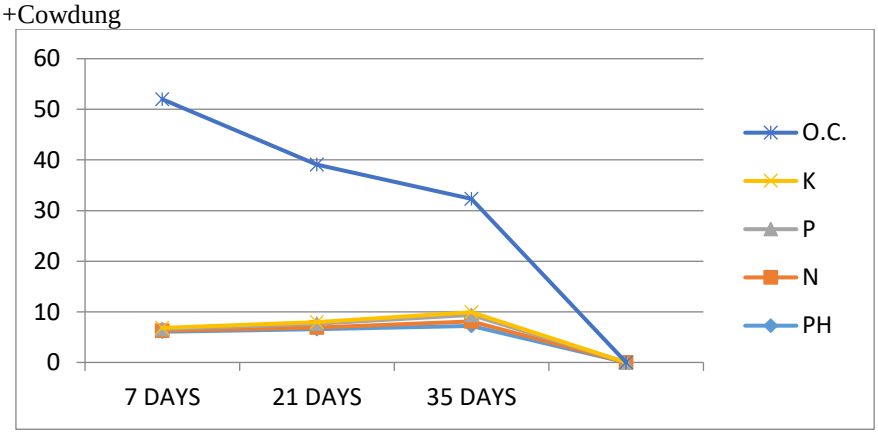
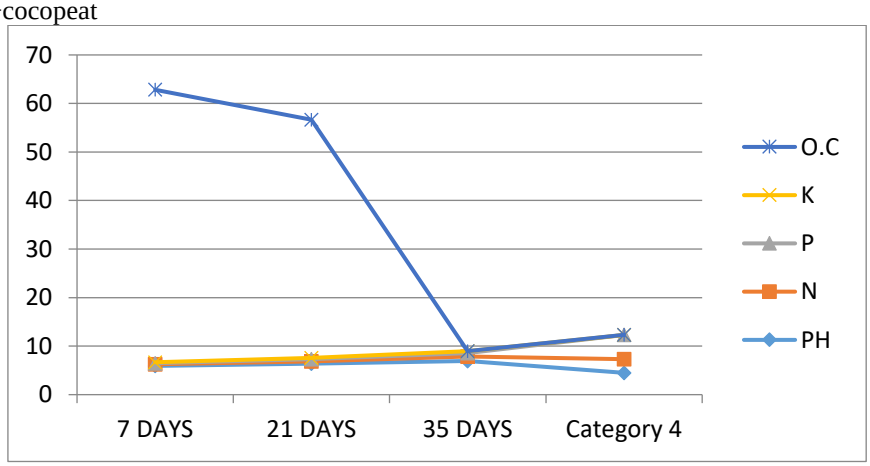
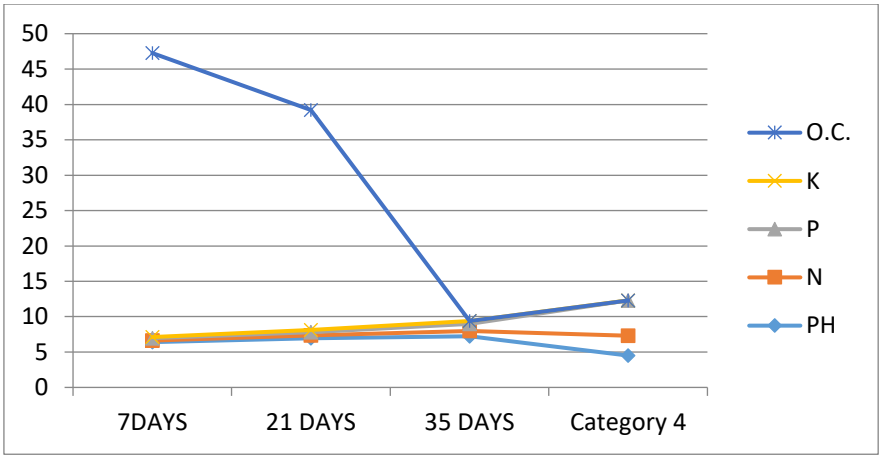
Kitchen waste +Cowdung



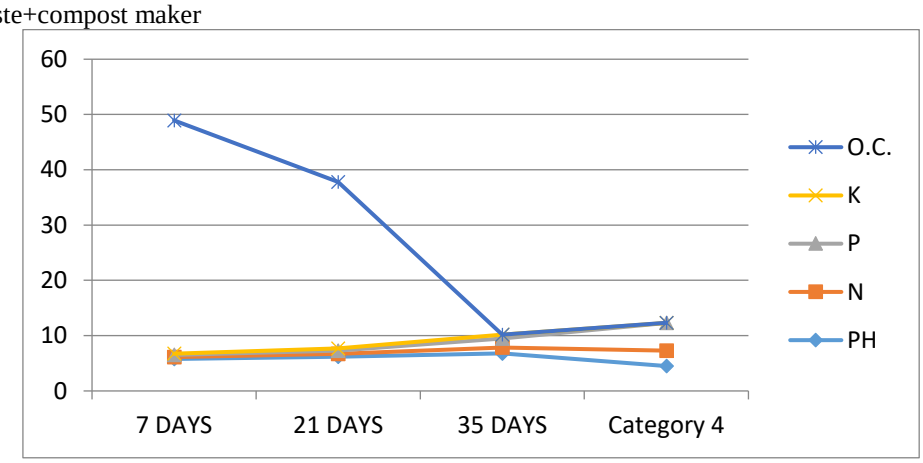
Kitchen waste+cocopeat



Kitchen waste +soil +earthworm



Kitchen waste+compost maker



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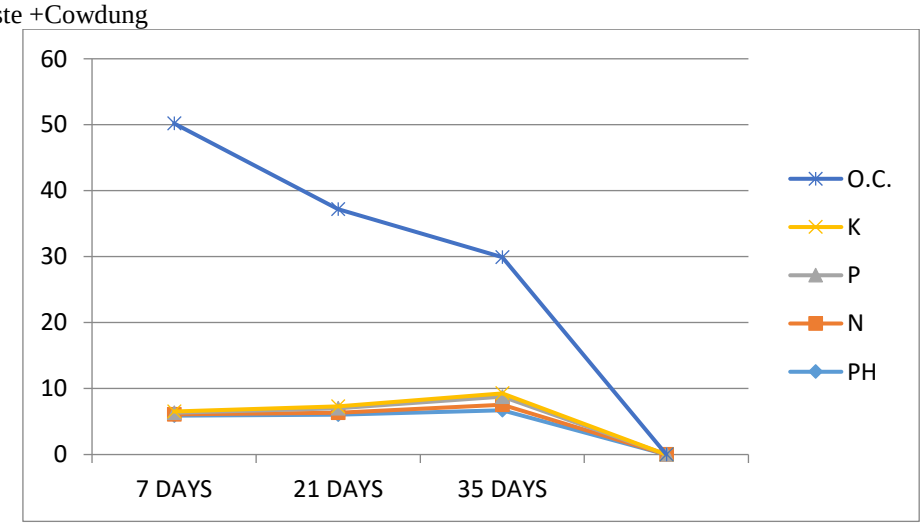

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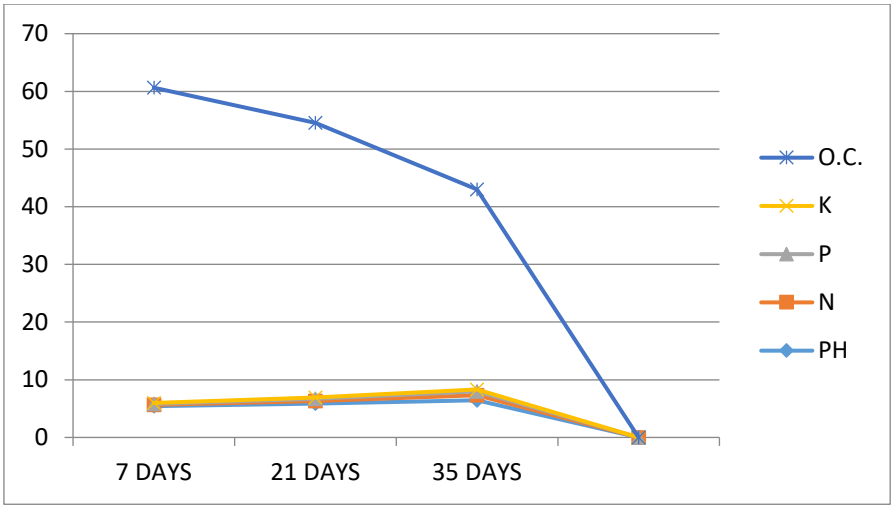
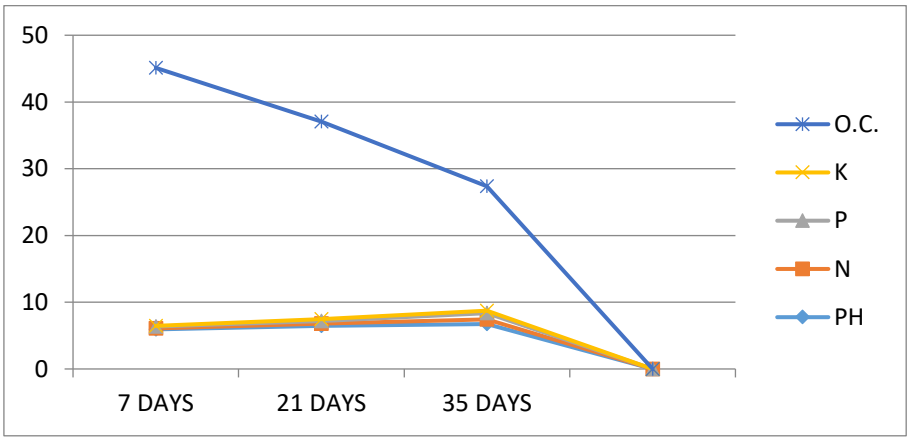
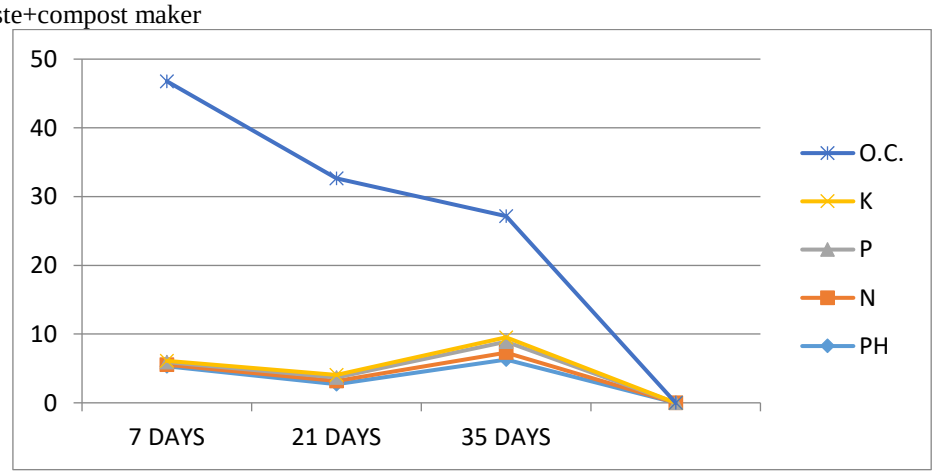


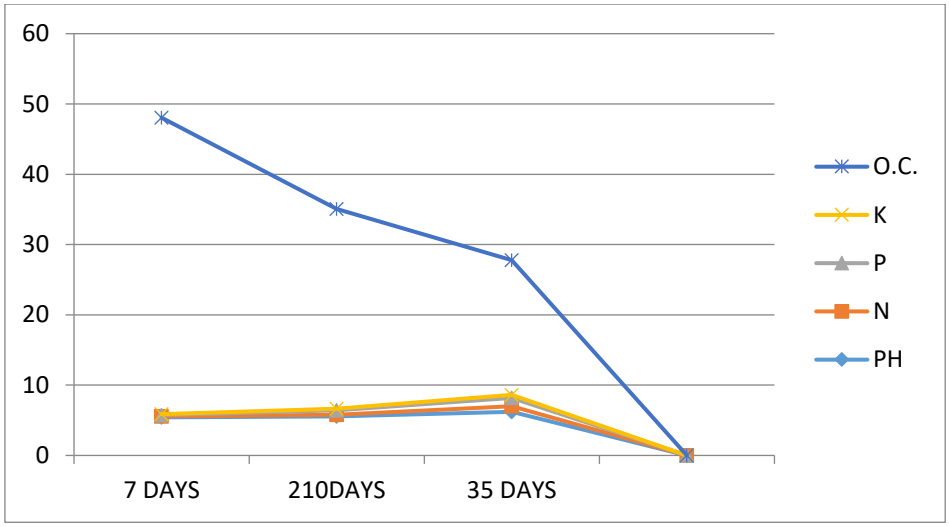
Kitchen waste +soil +earthworm



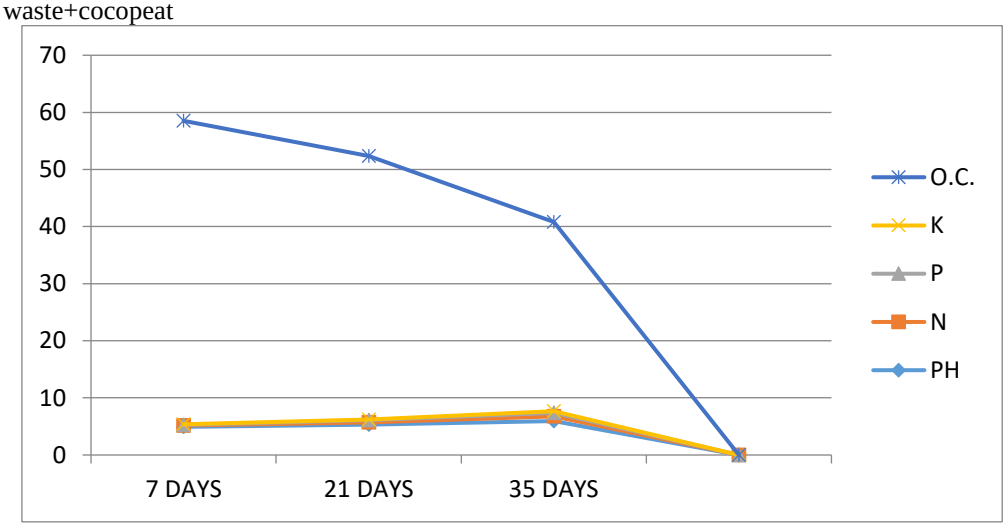
Kitchen waste+compost maker



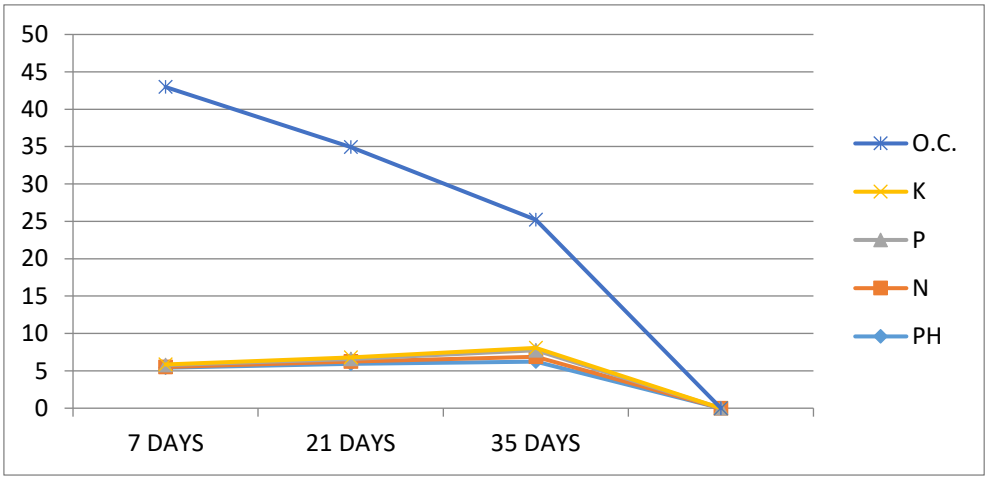
Kitchen waste +Cowdung



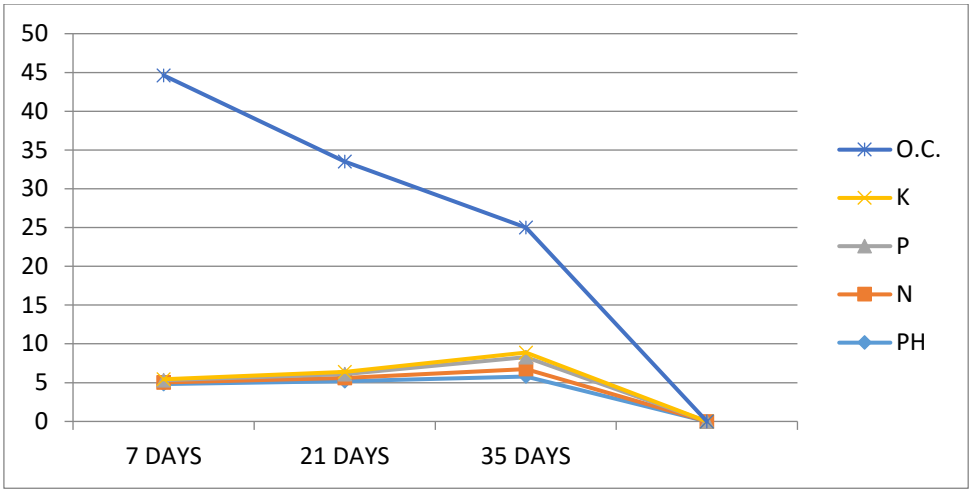
Kitchen waste+cocopeat



Kitchen waste +soil +earthworm



Kitchen waste+compost maker



5. CONCLUSION

From our result we concluide that the nutrient content of the compost from the composition of kitchen waste and compost maker was high.Experimental data provides a sound basis that nutrient contents are high in kitchen waste + compost maker composition . These will reducing the load on common waste treatment plant and creates pollution free environment

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