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DEVELOPMENT OF COMPOST USING DIFFERENT ORGANIC WASTE FORMULATION

MR.SAUBHAGYA SINGH
Ph.D scholar
Bundelkhand University,Jhansi

DR. ARCHANA CHAUDHARY
Associate Professor (Home science)
J.D.V.M.P.G. COLLEGE , KANPUR

ABSTRACT

Composting, or aerobic biological treatment of natural wastes, is an ancestral way to reduce wastes and to reuse organic count number (Tremier et al., 2003). Composting is defined by using Haug in 1980-Composting is a organic breakdown and stabilization of natural subjects within the presence of micro-organism. Micro-organism together with micro organism, fungi and many others are decomposed the organic rely inside the shape compost. Composting is a microbial procedure. Composting represents a method of natural waste treatment that is fully like minded with sustainable agriculture and compost software may want to counteract depletion of natural matter in soils. for the reason that compost may be constructed from exceptional wastes it's miles very critical to assess the first-rate of compost earlier than its software in agriculture. (Mondini et al., 2003) microbial pleasant of the compost some chemical houses and micronutrient of compost such pH,nitrogen,potassium,and phosphorus, calcium, C:Nratio, electric conductivity, moisture content, nitrogen, sodium, natural carbon, organic rely, zinc, iron, manganese, copper have been also monitored.

Key word - Composting, microbial , physicochemical ,organic

INTRODUCTION

Composting isn't always a new concept. within the herbal world, composting is what takes place as leaves pile up at the forest floor and start to decay. sooner or later, the rotting leaves are lower back to the soil, wherein residing roots can end the recycling process via reclaiming the vitamins from the decaying leaves. Composting may be at the root of agriculture as properly. a few scientists have speculated that as early peoples dumped meals wastes in piles near their camps, the wastes rotted and had been first rate habitat for the seeds of any food flowers that sprouted there. possibly humans started out to recognize that unload thousands were desirable places for food plants to grow, and began to place seeds there intentionally (Gotas et al.,1956).

Nowadays, the use of composting to show natural wastes right into a precious useful resource is expanding rapidly inside the usa and in other international locations, as landfill area turns into scarce and pricey, and as people turn out to be greater aware of the affects they have on the environment. In ten years, composting will probably be as not unusual as recycling aluminum cans is these days, both within the backyard and on an commercial scale. Many states inside the united states of america have said dreams or legislative mandates to appreciably reduce the quantity of waste being sent to landfills. utilizing backyard and kitchen wastes (which make up approximately 30% of the waste movement in the united states [1 is a massive a part of the plan to limit waste common. Which

materiel is ready after composting is referred to as compost .It acts as natural fertilizer. it is able to be sincerely carried out for fertilizing the soil and enhancing its shape .It increases aeration, organic be counted and microbial life in soil and as a result increases productiveness. All natural count may be composted .natural matter like plant, timber, leaves and animal excreta, specifically cow dung, hen dropping and horse dung ,are decomposed to shape compost.

sort of COMPOSTING

Composting is typically divided in to 2 classes .these are –

1- Aerobic composting

2-Anaerobic composting

AEROBIC COMPOSTING —

While the organic depend is decomposed inside the presence of oxygen (air) , the cease-fabricated from organic metabolism are carbon di oxide (CO2),NH3 water and warmth.

ANAEROBIC COMPOSTING —

When the natural wastes are decomposed within the absence Oxygen , the cease products are methane (CH4), CO2, NH3 , and trace amount of different gases. A biogas plant is an example of such decomposition.

COMPOSTING —

Leaf compost is partly or completely decomposed autumn leaves which may be used as a soil conditioner. whereas composting is usually the decomposition of organic count number by way of bacteria, leaves are decomposed via fungi. Decomposition and stabilization of natural waste count is a herbal phenomenon. Composting is an organized technique of producing compost manure by means of adopting this herbal phenomenon. Compost is specifically useful as organic manure which includes plant nutrients (Nitrogen, Phosphorous and Potassium) in addition to micro vitamins which can be applied for the growth of plant life.

FACTORS AFFECTING COMPOSTING —

All natural fabric will sooner or later decompose. the rate at which it decomposes depends on those factors:

1. Organisms
2. Carbon to nitrogen ratio of the fabric
3. quantity of surface region uncovered
4. Aeration, or oxygen within the pile
5. Moisture
6. Temperatures

ADVANTAGES OF COMPOSTING —

The primary functions and blessings of composting are labeled as follows :

(a) Waste stabilization-The biological response going on all through composting will convert the form of organic wastes in to solid, specially inorganic forms which could motive little in addition pollutants effects if discharged on to land or in to a water course.

(b) Pathogen inactivation-The waste warmness produced biologically in the course of composting Can reach temperature of approximately 60 OC , that's enough to inactivate maximum pathogenic micro organism , viruses and and so on.

(c) Nutrient and land reclamation-The nutrients (N, P, okay) present inside the wastes are typically in complicated natural paperwork, tough to be taken up by means of the plants . After composting, those nutrients would be inorganic paperwork.

(d) Sludge drying-Human excreta, animal manure and sludge contain approximately 80-95 percentage water, which make the charges of sludge series, transformation and disposal high-priced. Sludge drying through composting is an alternative in which the waste warmness produced biologically will evaporate the water contained inside the sludge.

QUANDARY OF COMPOSTING —

A primary drawback of composting concern the unreliability of the procedure in presenting the predicted nutrient concentrations and pathogen die-offs. because the characteristics of natural wastes can vary substantially from batch to batch, with time, climates and modes of operation, the houses of the composted merchandise would additionally vary consequently.

DISTINCT APPROACH OF COMPOSTING-

There are numerous distinctive strategies of composting .that are as follows:

- Windrow composting strategies
- In-Vessels composting methods
- backside blowing composting strategies
- alternative ventilation composting method
- speedy composting approach
- yard wastes composting
- On- farm composting

WINDROW COMPOSTING TECHNIQUE —

Windrow composting consists of placing the combination of raw materials in lengthy slim piles or windrows which are agitated or grew to become on a ordinary basis. The turning operation mixes the composting materials and complements passive aeration. commonly the windrows are to start with from 3 feet high for dense substances like manures to twelve feet high for fluffy materials like leaves. The width varies from 10 to twenty feet. The device used for turning determines the size, form, and spacing of the windrows. Bucket loaders with an extended attain can construct excessive windrows. Turning machines produce low, extensive windrows. Windrows aerate basically by herbal or passive air motion (convection and gaseous diffusion). The fee of air alternate relies upon at the porosity of the windrow. consequently, the dimensions of a windrow that can be efficiently aerated is determined by its porosity.

IN-VESSELS COMPOSTING APPROACH —

In-vessel composting refers to a group of strategies which confine the composting materials within a building, box, or vessel. In-vessel techniques rely on a diffusion of forced aeration and mechanical turning techniques to speed up the composting process. Many strategies combine techniques from the windrow and aerated pile strategies in an strive to conquer the deficiencies and make the most the attributes of every approach. There are a diffusion of in-vessel strategies with one of a kind combinations of vessels, aeration gadgets, and turning mechanisms. The few techniques discussed here have both been used or proposed for farm composting. in addition they serve as right examples of the sorts of invessel structures available.

The foremost advantage of this system is the possibility to control the manner ,resulting in a shorter duration of the thermophilic level than inside the open machine because oxygen is furnished by way of turning the composting mass can be uniformly oxygenated and the temperature may be easily controlled .

BACKSIDE BLOWING COMPOSTING APPROACH —

on this technique, bottom b This method has a tendency to chill and dry the lowest layers of the pile , leaving the outer layer heat and wet .

ALTERNATIVE AIR FLOW COMPOSTING TECHNIQUE—

In alternative ventilation method backside blowing aeration is alternated with bottom suction aeration .The alternative air movement leads to a homogenization of temperature and moisture in the course of the pile .

SPEEDY COMPOSTING APPROACH —

while traditional composting procedures take so long as four-eight months to provide completed compost, fast composting strategies provide possibilities for reducing the processing duration up to a few weeks. a diffusion of strategies and their combos have been used to hasten the composting procedure, which include the following:

BACKYARD WASTES COMPOSTING —

In backyard wastes composting, simple boxes for backyard wastes are the least labor and time –ingesting manner to compost .

area the holding devices in which it's far most convenient. As weeds , grass clipping , leaves and harvest stays from lawn vegetation are amassed , they can be dropped in to the unit .Shredding wastes , alternating excessive carbon and high – nitrogen substances and preserving accurate moisture and aeration will speed the system .

Nutrient content (N-P-ok)

Nitrogen (N), Phosphorus (P, generally expressed as P2O5), and Potassium (ok, commonly expressed as K20) are the 3 nutrients utilized by plants within the best portions, and therefore, are the vitamins most often contained in industrial and retail fertilizers. whilst bought in baggage of fertilizer, these three vitamins are measured and expressed on a dry weight foundation, in the shape of a percentage (%). In compost, nutrient content material can be expressed on a dry or wet weight (as obtained) basis. knowing the content of these nutrients will assist you're making correct selections regarding the addition of supplemental fertilization. despite the fact that concentrations of nutrients determined

In compost are commonly not high, in assessment to most fertilizer products, compost are usually applied at a whole lot extra fees, and consequently, can constitute a considerable cumulative amount. The nutrient content material of compost products range extensively; however, biosolids and animal manure based composts normally comprise more total nutrients. using positive composts may additionally lessen or take away the necessity to fertilize sure flowers throughout the primary 6 –12 months following its software. In popular, nutrients found in compost are in an 'natural' form for this reason launched slowly because the compost decomposes. other than N, P and okay, Calcium (Ca) and Magnesium (Mg) are also monitored in STA software trying out. The content material of these nutrients are said in the STA Compost Technical facts Sheet on each a dry weight basis (similar to fertilizers), and on 'as received' or 'wet weight' basis (because composts contain a miles better quantity of moisture, than do fertilizers). (US .,2010).

TRACE METALS-

Trace metals are factors whose concentrations are regulated because of the ability for toxicity to humans, animals, or flora. policies governing the heavy steel content material cloth of composts derived from positive feedstocks have been promulgated on every the dominion and Federal stages. similar limits have even been evolved for fertilizers and superb unique horticultural and agricultural merchandise. particular hint elements regularly referred to as heavy metals encompass arsenic, cadmium, chromium, copper, lead, mercury, molybdenum nickel, selenium, and zinc. the amount of those factors are measured on a dry weight foundation and expressed as mg/kg (milligram constant with kilogram) or ppm (additives in keeping with million). lots of those factors are without a doubt desired through the usage of vegetation for everyday increase, in spite of the reality that during limited portions. therefore, measuring the attention of these elements, in addition to different plant nutrients, can provide precious manage records relevant to the fertilizer requirements of vegetation and next fertilizer utility costs. positive heavy metals and hint factors are also identified to motive phytotoxic consequences in flora (even as available in very excessive quantities), and specific plant species are appeared to be more sensitive than others. the ones elements consist of boron, manganese, molybdenum, nickel, and selenium. but, the ones elements aren't generally found in compost in adverse portions. All composts that incorporate regulated feedstocks want to satisfy national and/or country safety necessities which will be advertised. (US., 2010)

COMPOST OPERATION

There are unique perspectives approximately how and while to use compost. It's proper that the vitamins in Compost are launched to stores sluggishly. still, if compost is carried out in advance than the crop is Planted the vitamins will get away to the air. As quickly because the compost is brought to the soil, small Quantities of vitamins are to be had to the germinating/ developing stores. thus, compost operation ought to be throughout planting time. This is due to the fact while carried out on the identical time the liberating system may be in the soil. still, it should not lie at the face of the soil, If compost is carried out earlier than planting. It has to be Ploughed or dug into thesoil.However, the compost ought to be positioned withinside the row If growers use rowplanting.with the seeds and additionally covered. Compost can assist manage manufacturing unit criticism and decrease crop losses.

Disease manage with compost has been attributed to 4 viable mechanisms

(1) A hit opposition for vitamins through salutarymicro-organisms;
(2) Antibiotic product through salutarymicro-organisms;
(3) A hit predation towards pathogens through salutarymicro-organisms; and
(4) Activation of criticism- resistant genes in stores through composts.

Scientists have better the naturalcapability of compost to suppress situations through perfecting it with precise criticism- fightingmicro-organisms or different emendations. This amended or " acclimatized " compost also can be carried out to plants inflamed through knownconditions. Research has proven that acclimatized compost drastically decreased or changed the operation of fungicides, pesticides, and nematicides that could negatively have an effect on water coffers, meals safety, and workersafety. The use of acclimatized compost also can be greater cost-powerful than chemical soil remedies, comparable as methyl platitude. Soil handled with compost keeps irrigation water greater, which lowers water costs. Chemicals additionally should be carried out greater regularly than compost. In addition, a few chemical substances havere-access situations that enjoin employees from getting into a subject incontinently after chemical substances were carried out, lowering workerproductivity .

REVIEW OF LITERATURE

According to the previous take a look at performed through numerous experimenters on composting is the maximum salutary for the stores increase. Composting is the herbal miracle.

(Gabhane et al., 2012) The effect of various additives such as fly ash, phosphogypsum, jaggery, lime, and polyethylene glycol ongreen waste composting was investigated through assessing their influence on microbial growth, enzymatic activities, organic matter degradation, bulk density, quality of finished compost including gradation test, heavy metal analysis, etc. A perusal of results showed that addition of jaggery and polyethylene glycol were helpful to facilitate composting process as they significantly influenced the growth of microbes and cellulase activity. The quality of finished compost prepared from jiggery and polyethylene glycol added treatments were superior to other composts, wherein reduction in C/N ratio was more than 8% in jaggery treatment. All other parameters of compost quality including gradation test also favored jaggery and polyethylene glycol as the best additives for green waste composting.

Karnchanawong *et al*., 2011 studied on Household organic waste composting and concluded that biological rate high in organic waste. Tremier *et al*.,2004 conduct study on composting that respirometric method is a useful tool for the characterization of solid organic matter biodegradability and for the modelling of the biological kinetics of the composting process.

Murovhi *et al*., 2011 examine that the use of leaf litter biomass in the small-scale sector was strongly influenced by age, income and farm size of the respondent farmers implying that these factors be considered when establishing strategies to maintain soil fertility and increase food productivity within the small-scale sectors. The results showed that 95% of the farmers use leaf litter for maintaining soil fertility on their fields. About 70% of the respondent farmers mixed leaf litter with amendments such as kraal and chicken manure in order to improve its nutrient content quality. Composting was also used by the farmers as a technique to improve the quality of leaf litter.

Singh *et al*., 2011 Extensive studies are available on the population of bacteria, actinomycetes, and fungi during composting process. Microbes perform their essential function with the help of some key enzymes they produce, such as lignocellulases, proteases, lipases, phosphatases, arlylsulphatases, etc., and measurement of these enzymes also indicates the progress of composting process. Oxidoreductases such as superoxide dismutase, catalase, and protease activities reflect the intensity of microbial activity such as respiration and biodegradation. Bioaugmentation with efficient lignocellulolytic microbes may accelerate the composting process. Oxygen, temperature, moisture, C:N ratio, and organic-C/organic-N ratio are the major factors affecting composting process.

OBJECTIVES

1. Preparation and Collection of leaves, vegetable waste, cow dong for composting.
2. To evaluate microbial population in compost.
3. To evaluate physicochemical charterstics of compost.

MATERIALS AND METHODS

In the processes of composting we used the waste (leaf litter, cow dung, vegetable waste, soil,) . The detail methodology is given below.

- Container
- Site selection and
- Bedding material
- Waste
- Cover of feed substrates
- Moisture

Firstly a container (tub) which is in diameter, constructed with plastic.Collect the leaf litter *Ficus religiosa* (peepal), *Saraca Asoca* (ashoka), *Syzygium Cumini* (jamun), *Neolamarckia cadamba* (kadam), *Ficus Benghalensis* (*Bargad)* from different area of Lucknow, cow dunk taken from southcity and vegetable waste collect from sabji mandi of machhi bazaar..

Procedure:

I keep the tub at the departmental net house and placed the 200g leaf of kadam, 200 leaf of pipal, 200g leaf of ashok,200g of jamun,200g of bargad.200g soil,200g vegetable waste, mixed together And closed with jute cover and 2 litter of water sprinkled over it.

For maintain the bed (for Moisture content) about 1-2 liter water sprinkled alternate day. I weekly turn the bedding material for better decomposition. It takes around 45 days for completion of the procedure of compost formation.

Composition:- It consist of a numbers of organic compound such as carbohydrates lignin, fats and proteins, free amino acid, terpenoids, carotenoids, flavonoids, alkaloids, polyphenols,resins etc.

Microbial Analysis:

Microbial analysis for the number of microorganism was done after 1, 15, 45 days for the number of total viable bacteria on Nutrient Agar (NA) and fungi on Czapek-Dox Agar (CDA).

Both media were prepared from Hi Media.

Physico-chemical Parameter:

Temperature:

Temperature of the composting material was recorded with the help of Centigrade thermometer at the study site.

Hydrogen ion concentration (pH) :

The pH of compost was determined in 1:2.5 compost water suspension using a digital pH meter was used to obtain the pH of compost. The pH meter was first calibrated by using buffers of pH 7.0 and 4.0.

$$pH = - \log [H^+]$$

Electrical conductivity:

The electrical conductivity of compost sample was measured in a supernatant liquid of the compost water suspension 1:2.5 with the help of digital EC meter and was expressed in ds m^{-1}.

Moisture content:

The moisture content of waste is water in it expressed as a %of its wet weight. The initial weight of paper was recorded. The waste was put on it and weighted. This was placed in a hot air oven and kept for 24 hour sat 110oC.after 24 hours the weight was taken.

$$\text{Moisture content} = \frac{Ww - Wd \times 100}{Ww}$$

Where

Ww –Wet weight

Wd – Dry weight

Organic Carbon:

Organic carbon in the soil sample was determined by wet digestion method of Used Walkley and black (1934) as described by Jackson (1967), by rapid dichromate technique. Take 10 ml of 1N potassium dichromate solution in a 250 ml conical flask. Add 20 ml con. sulphuric acid And then add 200 ml of distilled water. Then add 10ml of orthophosphric acid and 1 ml indicator, the content is titrated with ammonium ferrous sulfate solution till the color flashes from blue-violet to green.

$$\text{Organic C (\%)} = \frac{10\,(B-T)}{B} \times 0.003 \times \frac{100}{S}$$

Where,

B =Volume of ferrous ammonium sulfate required for blank titration in ml.
T = Volume of ferrous ammonium sulfate needed for soil sample in ml.
S =Wt. of soil in g

Organic matter:

$$\text{Organic matter} = \text{OC \%} \times 1.724$$

Nitrogen:

Alkaline Permanganate Extraction Method used for determination of available nitrogen. A 1.0 g sample of air-dried soil was placed directly in a 100-ml distillation flask designed for use with the steam distillation apparatus. Next, 10 ml of 0.25 M NaOH containing 0.1g of $KMnO_4$ was added to the flask. The distillation flask was attached to the steam distillation apparatus and the ammonia-N liberated from the distillation of the mixture for 4 minutes was collected in a 50-ml Erlenmeyer flask containing 5 ml of H_3BO_3 acid-indicator solution. The amount of NH_4-N was then determined by titration with standard 0.005 N H_2SO_4 from a digital micro-burette. Another 1.0 g sample of soil was treated with 10 ml of 0.25 M NaOH in the absence of the $KMnO_4$, and the previous procedures were arrived out. The NH_4-N produced by alkaline KMnO4 oxidation was calculated as the difference between the results of the two analyses. (Methyl red and bromocresol green indicator).

Phosphorus:

In this estimation we used Bray's method. Take 5 ml of the soil extract into a 25 ml volumetric flask to which add 5 ml of deskman's and bray's reagent. 1ml of the dilute stannous chloride solution is added and volume is made up. The intensity of the blue color is measured at 450 nm. The concentration of phosphorus is determined the colorimeter.

$$\text{Bray's P (kg/ha)} = R \times \frac{50}{5} \times \frac{1}{5} \times 2.24$$

Where,

R = µg of phosphorus in aliquot.

Potassium, Calcium, sodium:

Extraction by centrifugation and decantation procedure. Place 1g of soil in a 50 ml conical flask . Add 25 ml of NH4OAc, and shake the flask for 30 minutes on shekar. Than filter the solution 25 ml beaker with the help of watman paper and determine K ,Ca, Na by flame photometer.

$$R = 25 \times K$$

µg/gm soil

$$\text{Available Potassium \%} = \frac{R \times 100}{1000 \times 1000}$$

Where,

K = reading by flame photometer
A = K content of soil extract from standard curve, mg/l
V = Volume of the soil extract, ml
W = Weight of air dry samples taken for extraction in g

SEM/EDX

EDX is done Scanning Electron Microscope (SEM) Model: JSM-6490LV to detect the element present in sample with the help of different level of electron beam.

Iron, Zinc, Manganese, Copper :

Labile Zn, Fe, Mn and Cu in composting were determined by DTPA method proposed by Lindsay and Norvell (1978). The method included shaking of 10 g of compost with 20 ml of 0.005 M DTPA + 0.01 M $CaCl_2$ + 0.1 triethanolamine (pH 7.3) for two hours on a horizontal plateform shaker at 25 ± ^{O}C. Zn, Fe, Mn and Cu in the extracts obtained after filtration were analyzed by atomic absorption spectroscopy (Thermo Scientific AA 303D S/W Ver.4.97).

RESULT AND DISCUSSION

Chemical Characteristics

Besides microbial quality of the compost some chemical properties and micronutrient of compost such pH,nitrogen,potassium,and phosphorus, calcium, C:Nratio, electrical conductivity, moisture content, nitrogen, sodium, organic carbon, organic matter, zinc, iron, manganese, copper were also monitored.

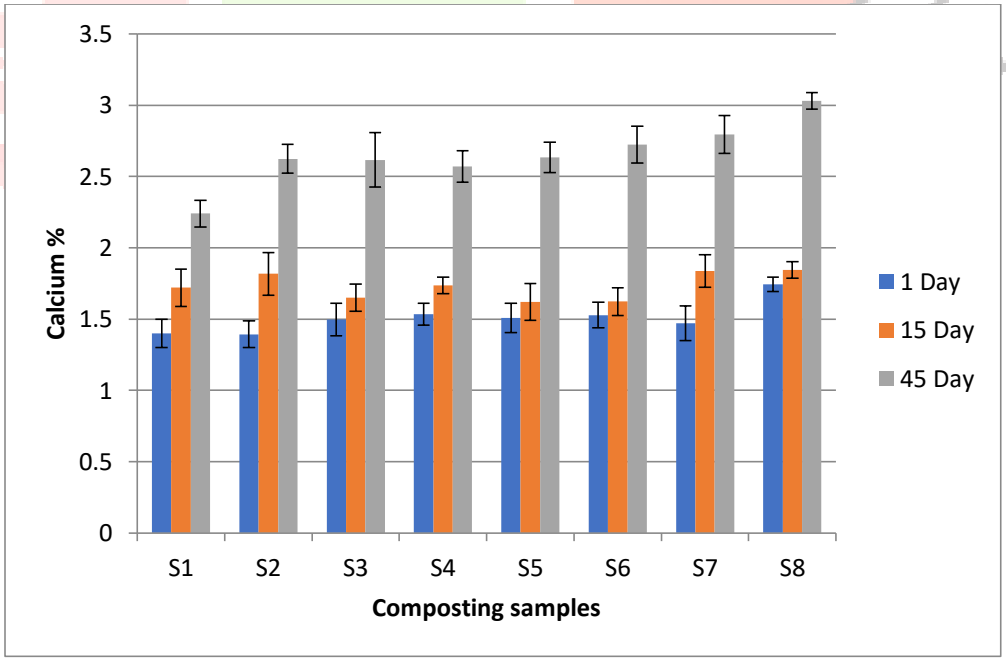

Fig: 5.1: Percentage of Calcium content in different compost samples.

Calcium percentage found that in compost samples (S1, S2, S3, S4, S5, S6, S7, S8) increases from day first to day forty five are (1.4 to 2.24, 1.39 to 2.62, 1.50 to 2.61, 1.53 to 2.57, 1.51 to 2.63, 1.62 to 2.72, 1.47 to 2.79, 1.74 to 3.03) respectively.(fig 5.1).

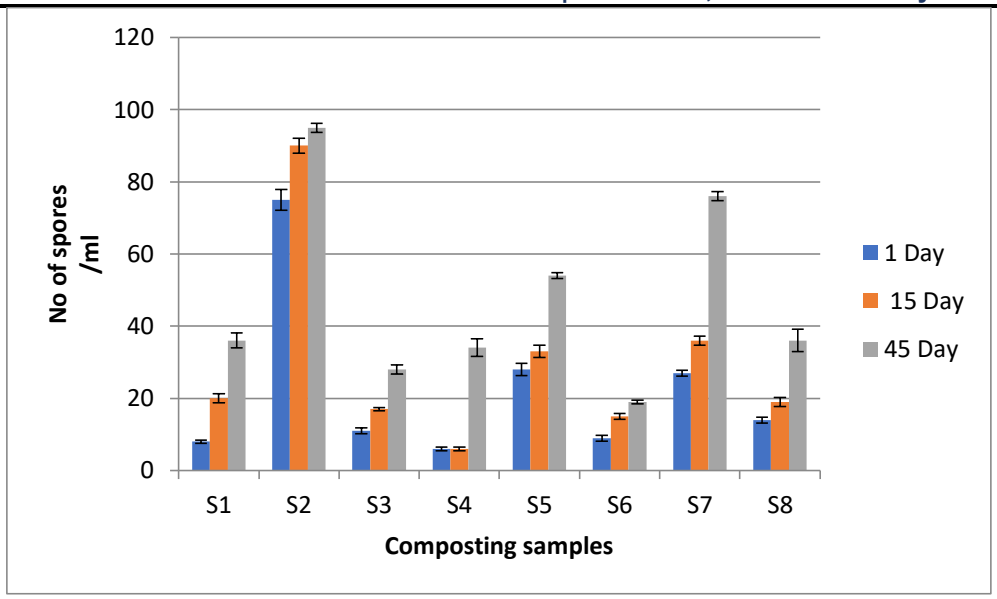

Fig: 5.2: No of spores in per ml different compost samples.

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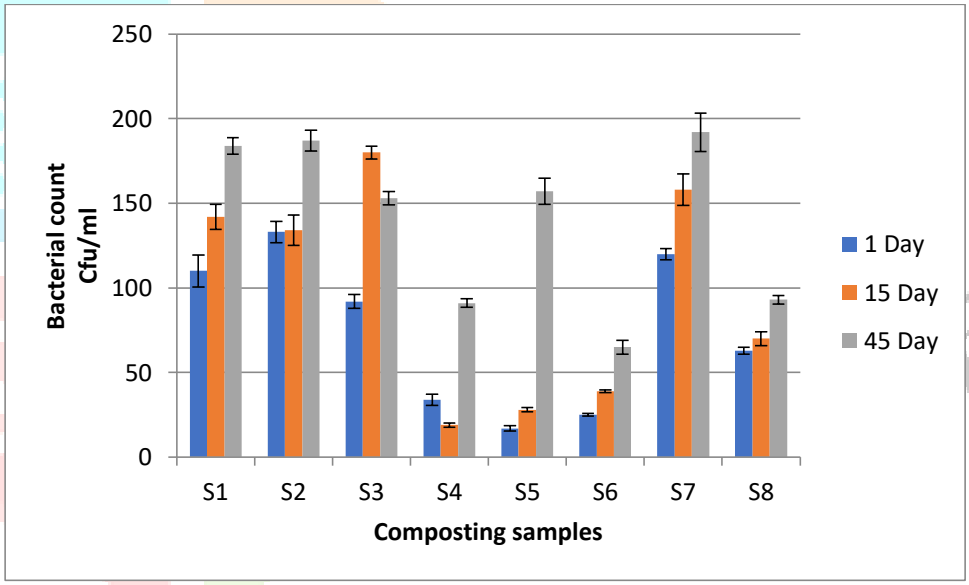

Fig: 5.3: Bacterial Count in different compost samples

Bacterial population and no of spores found that in compost samples (S1, S2, S3, S4, S5, S6, S7, S8) increases from day first to day forty five.(fig.5.2 and 5.3).

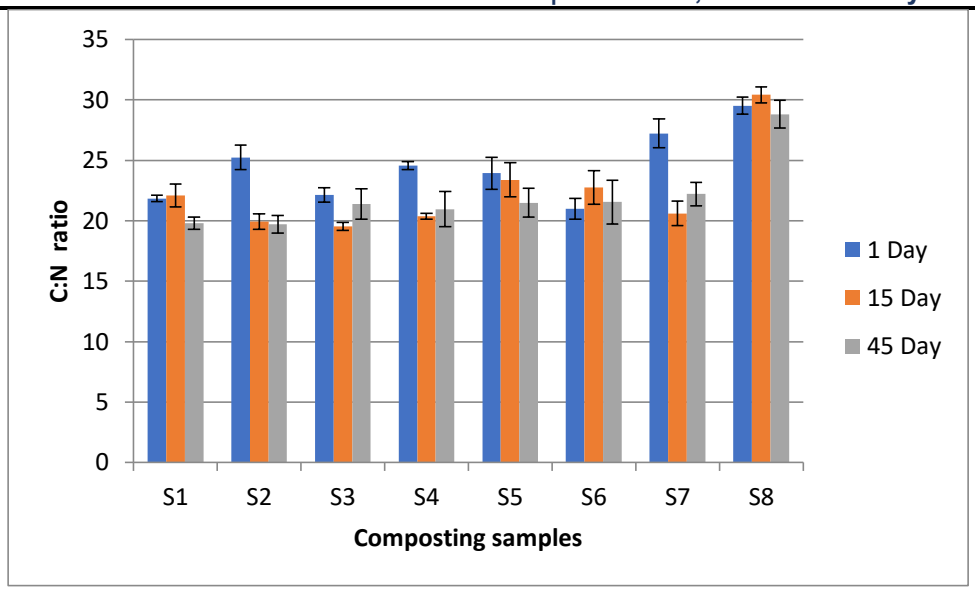

Fig: 5.4: Carbon and nitrogen ratio content in diffrent compost samples.

Carbon nitrogen ratio found that in compost samples (S1, S2, S3, S4, S5, S6, S7, S8) increases from day first to day forty five are (22.09 to 20.26, 25.29 to 20.55, 22.11 to 21.49, 24.81 to 21.93, 23.57 to 21.51, 21.11to 24.41, 25.12 to 22.25, 28.91 to 30.44 respectively. except one samples(S5) where C:N ratio continually decreasing.

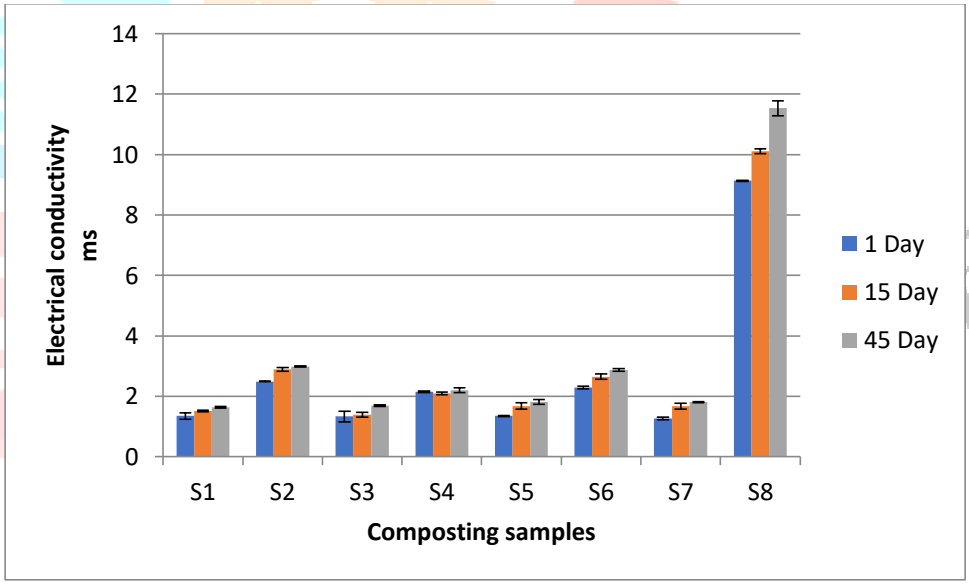

Fig: 5.5: Electrical Conductivity in different compost samples.

Electric conductivity in compost samples (S1, S2, S3, S4, S5, S6, S7, S8) from day first to day forty five are (1.35 to 1.64, 2.49 to 2.94, 1.33 to 1.09, 2.15 to 2.2, 1.35 to 1.31, 2.29 to 2.28, 1.27 to 1.21, 9.13 to 11.53) respectively, except four samples(S4, S5, S6, S7) where EC continually decreasing.

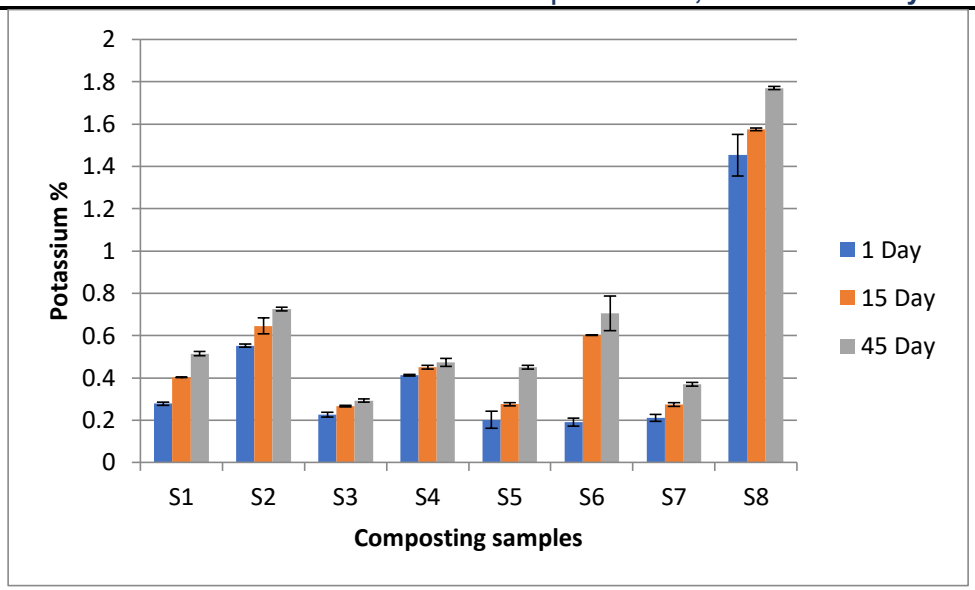

Fig: 5.6: Percentage of Potassium content in different compost samples

Potassium percentage found that in compost samples (S1, S2, S3, S4, S5, S6, S7, S8) increases from day first to day forty five are (0.28 to 0.51, 0.65 to 0.73, 0.22 to 0.26, 0.44 to 0.47, 0.28 to 0.45, 0.19 to 0.71, 0.26 to 0.37, 1.65 to 1.77) respectively.(fig 5.6)

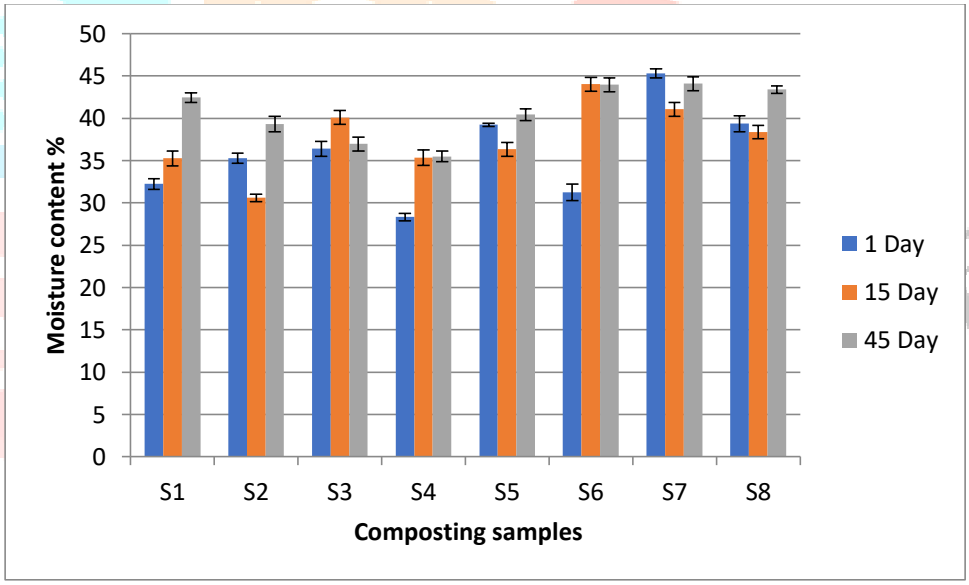

Fig: 5.7: Percentage Moisture content in different compost samples.

Moisture content percentage found that in compost samples (S1, S2, S3, S4, S5, S6, S7, S8) increases from day first to day forty five are (42.45 to 32.23, 39.34 to 35.29, 36.98 to 36.39 , 35.38 to 28.34, 40.42 to 39.29, 43.95 to 31.22, 44.09 to 45.29, 43.39 to 35.35) respectively.(fig 5.7)

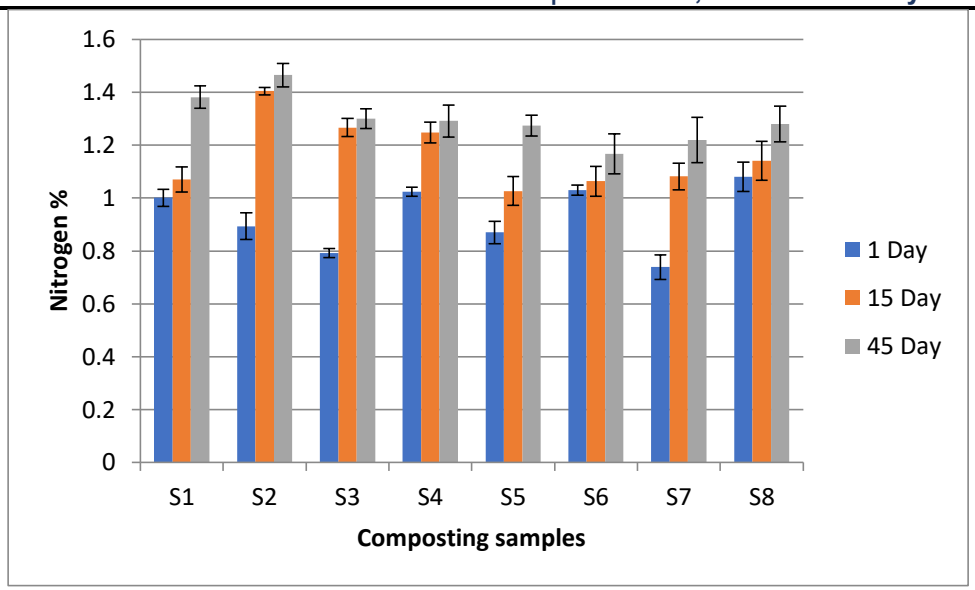

Fig: 5.8: Percentage Nitrogen content in different compost samples.

Nitrogen percentage found that in compost samples (S1, S2, S3, S4, S5, S6, S7, S8) increases from day first to day forty five are (1.071to 1.382, 0.894 to1.405, 0.793 to 1.301, 1.024 to 1.292, 1.027 to 1.274, 1.064 to1.03, 0.739 to 1.22, 1.28 to1.141) respectively.

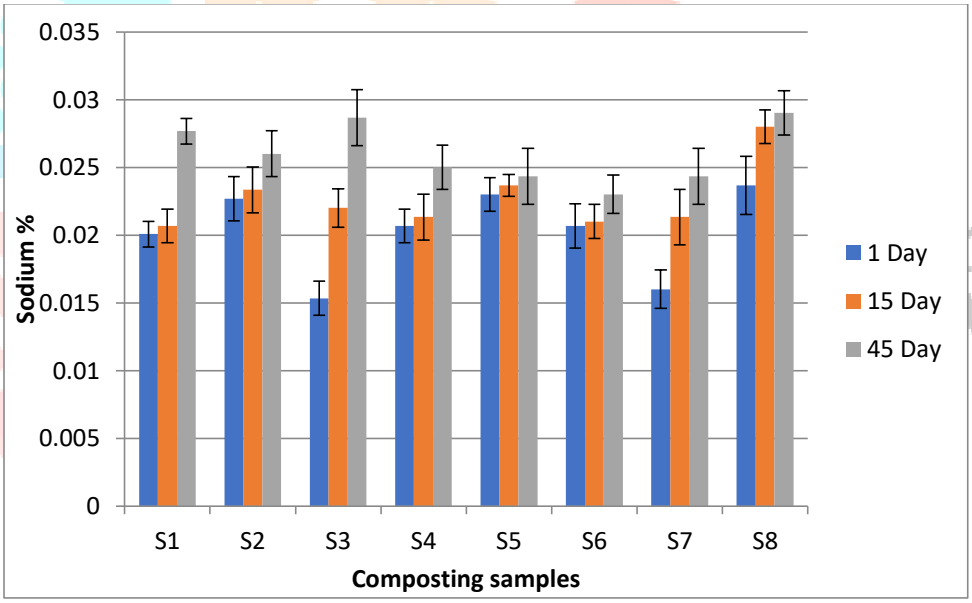

Fig: 5.9: Percentage Sodium content in different compost samples.

Sodium percentage found that in compost samples (S1, S2, S3, S4, S5, S6, S7, S8) increases from day first to day forty five are (0.021 to 0.027, 0.022 to 0.026, 0.015 to 0.028, 0.020 to 0.025, 0.023 to 0.024, 0.020 to 0.023, 0.016 to 0.024, 0.023 to 0.029) respectively.(fig 5.9)

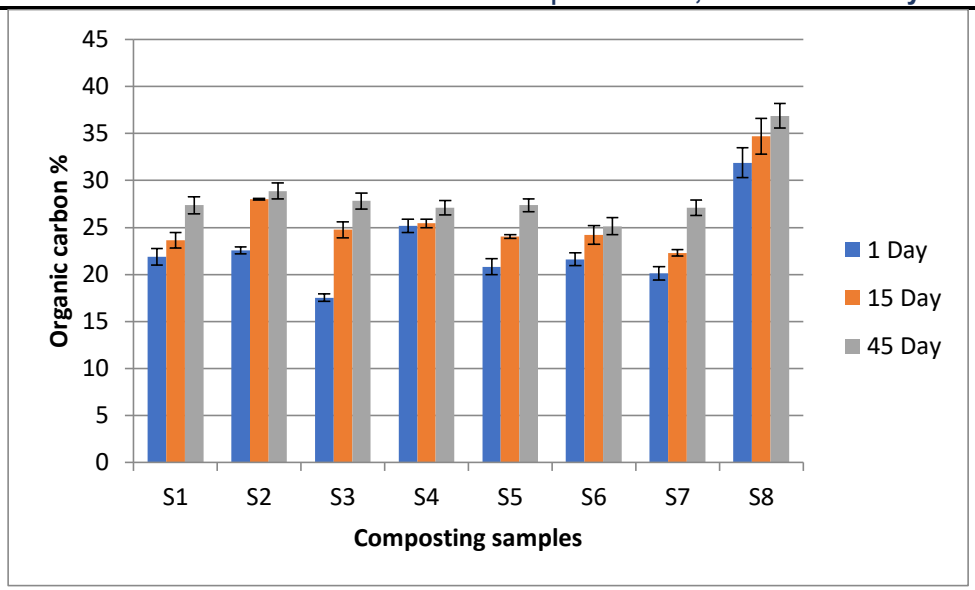

Fig: 5.10: Percentage Organic carbon in different compost samples.

Organic carbon percentage found that in compost samples (S1, S2, S3, S4, S5, S6, S7, S8) increases from day first to day forty five are (23.66 to 27.36, 22.56 to 28.82, 17.54 to 27.82, 25.43 to 27.09, 24.02 to 27.37, 21.62 to 25.14, 20.12 to 27.09, 36.87 to 34.7) respectively.

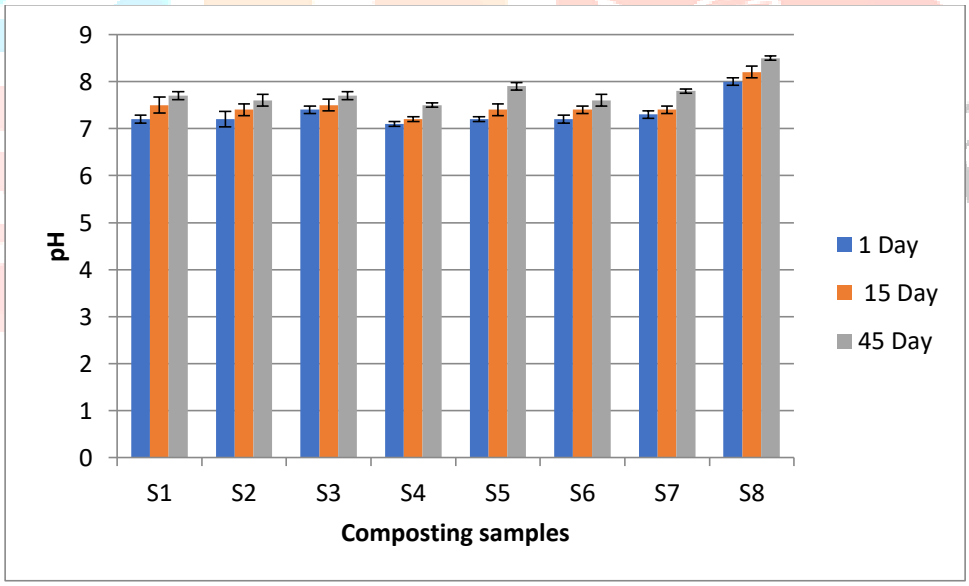

Fig: 5.11: p^H of diffrent compost samples.

pH found that in compost samples (S1, S2, S3, S4, S5, S6, S7, S8) increases from day first to day forty five- (7.2 to 7.8,7.5 to 7.6,7.4 to 7.5,7.5 to 7.3.7.4 to 7.2, 7.2 to 7.8, 7.1 to 7.4, 8to 8.5). respectively, except three (S3,S4,S5). where pH continually decreasing.

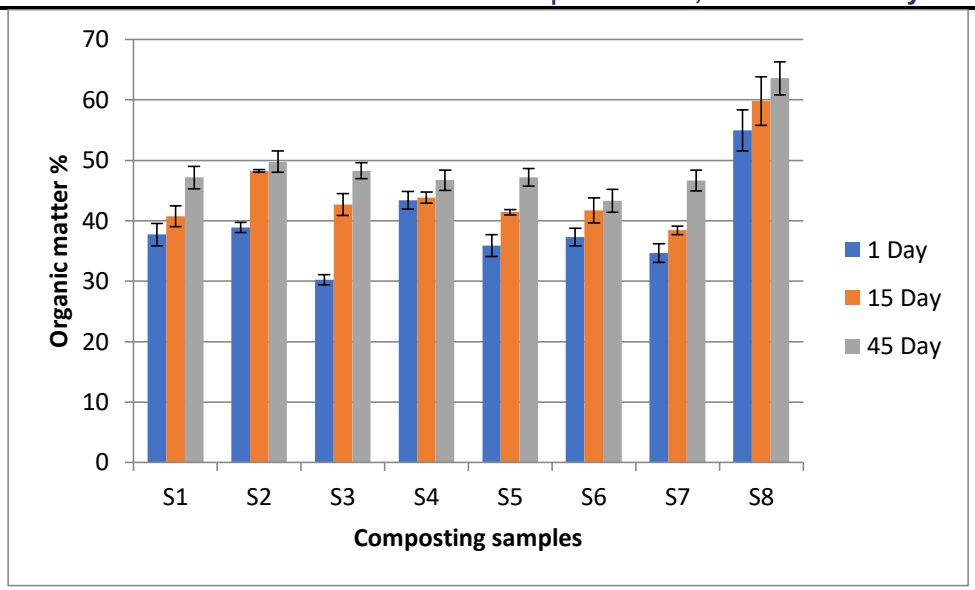

Fig: 5.12: Percentage Organic matter content in different compost samples.

Organic matter percentage found that in compost samples (S1, S2, S3, S4, S5, S6, S7, S8) increases from day first to day forty five are (40.78 to 47.17, 38.91 to 49.78, 30.23 to 48.29, 43.84 to 46.71, 41.41 to 47.18, 37.27 to 43.33, 34.64 to 46.69, 63.56 to 59.83) respectively. except six samples (S1, S2, S3, S4, S5, S6) where organic matter continually decreasing. (fig 5.12).

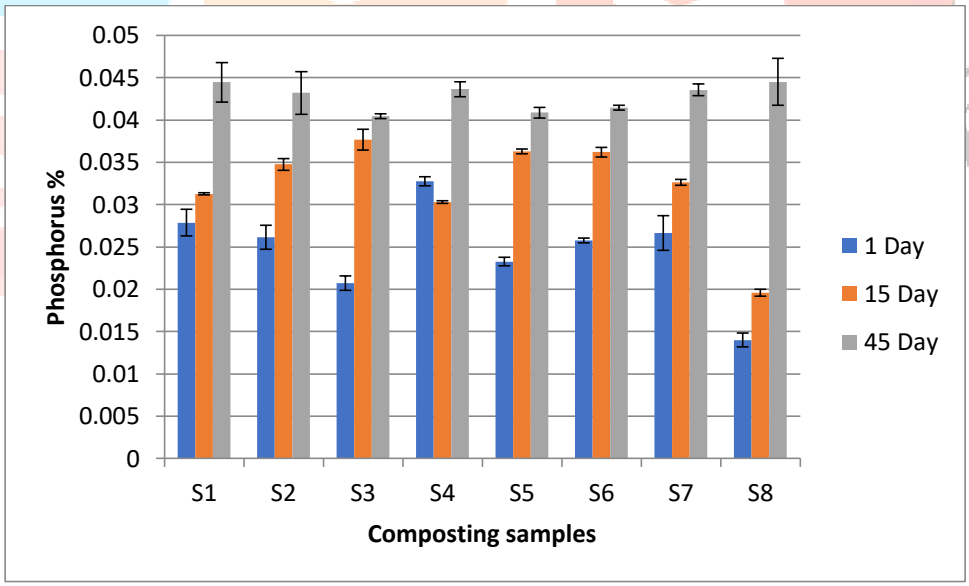

Fig: 5.13: Percentage Phosphorus content in different compost samples.

Phosphorus percentage found that in compost samples (S1, S2, S3, S4, S5, S6, S7, S8) increases from day first to day forty five are (0.0279 to 0.044, 0.0261 to 0.0432, 0.0207 to 0.040, 0.0328 to 0.044, 0.0233 to 0.041, 0.025

to 0.041, 0.0266 to 0.0438, 0.014 to 0.0445) respectively.(fig 5.13).

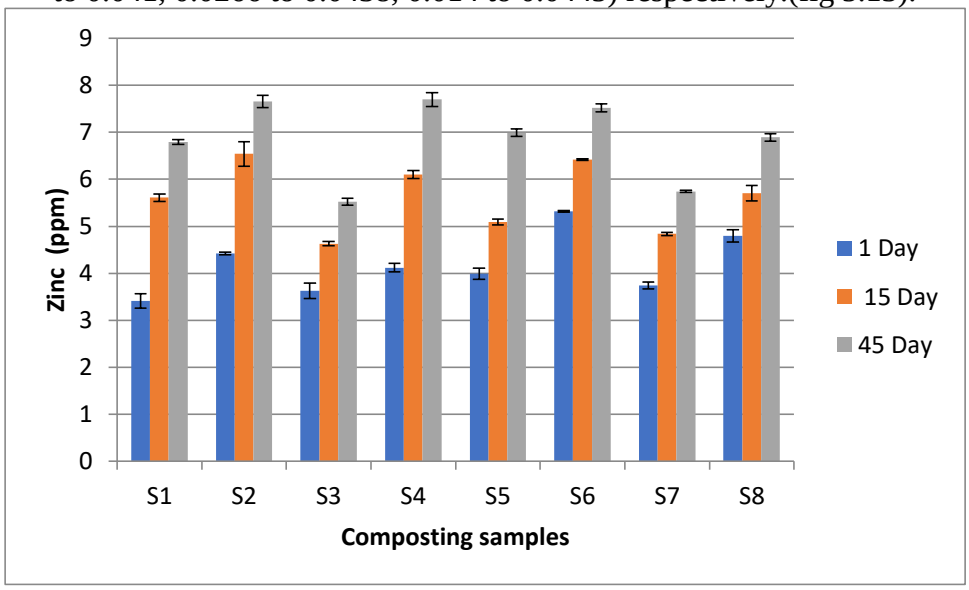

Fig: 5.14: Zinc content in different compost samples.

Zinc found that in compost samples (S1, S2, S3, S4, S5, S6, S7, S8) increases from day first to day forty five are (3.41 to 6.79, 4.42 to 7.67, 3.63 to 5.52, 4.12 to 7.7, 3.99 to 6.99, 5.32 to 7.52, 3.74 to 5.7,4 4.8 to 6.89) respectively.

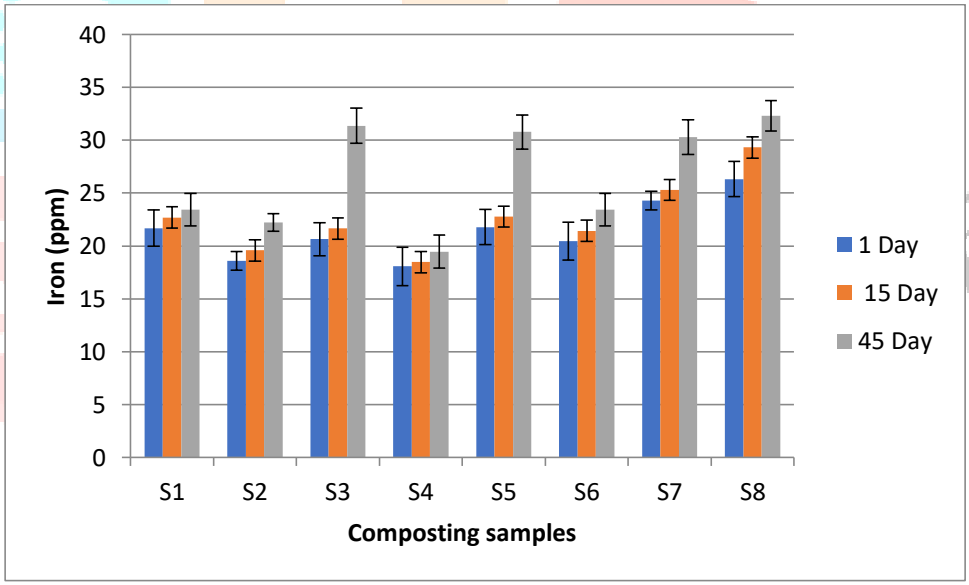

Fig: 5. 15: Iron content in different compost samples.

Iron found that in compost samples (S1, S2, S3, S4, S5, S6, S7, S8) increases from day first to day forty five are (21.69 t o 23.44, 18.58 to 22.23, 20.65 to 31.37, 18.07 to19.47, 21.78 to 30.78, 20.44 to 23.44, 24.30 to 30.31, 26.32 to 32.42) respectively.

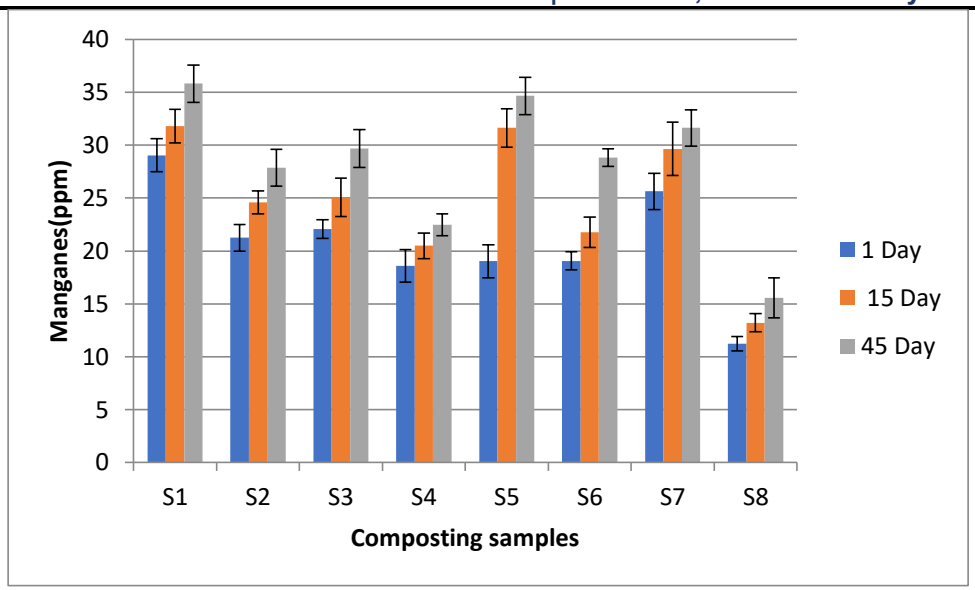

Fig: 5.16: Manganese content in different compost samples.

Manganese found that in compost samples (S1, S2, S3, S4, S5, S6, S7, S8) increases from day first to day forty five are (29.05 to 35.83, 21.25 to 27.88, 22.07 to 29.7, 18.65 to 22.49, 18.89 to 34.66, 19.01 to 28.84, 25.64 to31.64, 11.24to 15.56) respectively

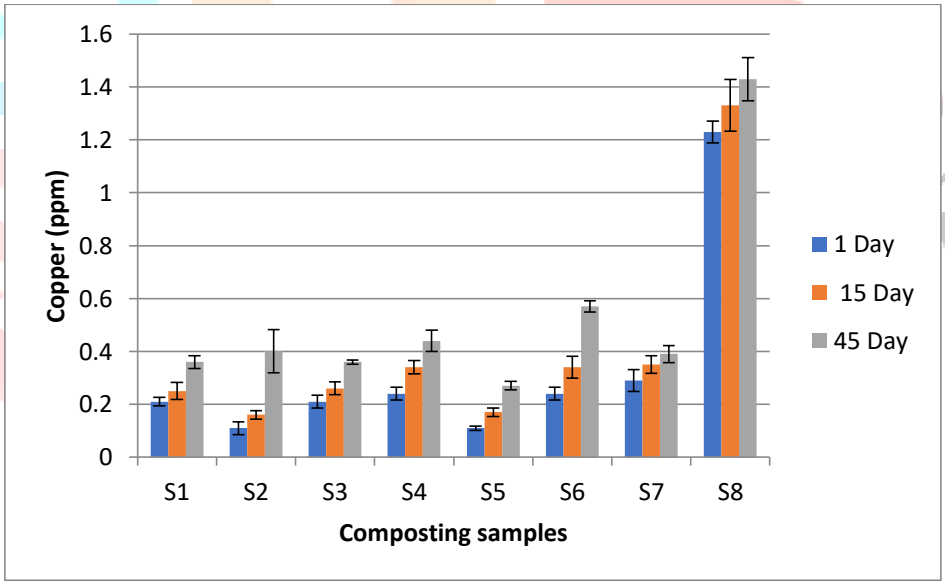

Fig: 5.17: Copper content in different compost samples.

Copper found that in compost samples (S1, S2, S3, S4, S5, S6, S7, S8) increases from day first to day forty five are (.021 to 0.36,0.11 to0.04, 0.21 to 0.36, 0.24 to 0.44, 0.11to 0.27, 0.24 to 0.57, 0.29 to 0.39, 1.23 to 1.13)) respectively. (fig, 5.17)

REFERENCES

1. Compost Made Simple". Greenmi.net. Retrieved 21.2013
2. Composting - Compost Microorganisms". *Cornell University*. Retrieved 6 October 2010.
3. Composting & plant nutrition [http://www.ibiblio.org/rge/course/compost.htm].
4. Composting http://urbanindia.nic.in/publicinfo/swm/chap14.
5. Gotas, H.B., (1956). Composting; Sanitary Disposal and Reclamation of organic wastes, *World health organization*, Geneva 1.
6. Karnchanawong. Somjai. Suriyanon Nakorn (2011). Household organic waste composting using bins with different types of passive aeration Resources, Conservation and Recycling. (55). 548–553.
7. Murovhi1, N.R., Materechera, S.A., Mkhabela, T.S., (2011). Socio-economic determinants of small-scale farmers' fruit trees leaf litter utilization for soil fertility management in a sub-tropical environment: The case of Mpumalanga, South Africa *African Journal of Agricultural Research* (6) 32, 6674-6683.
8. Tremier, A., Guardia, A., Massiani, C., Paul, E., Marte , J., (2004). A respirometric method for characterizing the organic composition and biodegradation kinetics and the temperature influence on the biodegradation kinetics, for a mixture of sludge and bulking agent to be co-composted. *Bioresource Technology* .(96) 169–180.
9. https://www.compostingcouncil.org/page/CompostCharacteristics
10. https://www.compostingcouncil.org/page/CompostCharacteristics#:~:text=These%20elements%20include%20boron%2C%20manganese,in%20compost%20in%20detrimental%20quantities.
11. https://www.quora.com/Are-the-seeds-from-which-microgreens-are-grown-as-rich-in-vitamins-as-the-greens-themselves-when-grown-without-soil-or-nutrients
12. https://www.epa.gov/sites/production/files/2015-08/documents/disease.pdf
13. https://www.calameo.com/books/001640262de13a0f89383
14. https://nepis.epa.gov/Exe/ZyPURL.cgi?Dockey=10000LT4.TXT
15. https://www.calameo.com/books/001640262de13a0f89383