

Enzyme activity on *arachis hypogaea l.* with the influence of vermicompost treatment

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ABSTRACT

Compositing has been recognized as a low cost and environmentally sound process for treatment of many organic waste. Vermicompost is the type of compositing that was studied on the growth parameters of Ground Nut plant [*Arachis hypogaea*.L]. Vermicomposts are products delivered from the accelerated biological degradation of the organic waste by earth worm and micro organisms. Vermicompost chemical composition contains especially nitrates, exchangeable phosphorous, soluble potassium, calcium and magnesium than that of growth media. The study was mainly aimed on the plant growth and biochemical composition on the seedlings that was grown in difference composition of the vermicompost such as [10%-100%]. The enzyme assay shows variations in different concentration

KEY WORDS: Vermicompost, Ground Nut, Catalase.

1. INTRODUCTION

In microbial activity of further decomposition (Dominguez, 2010). Organic vegetable cultivation gets a special attention ground nut (*Arachis hypogaea* L.) is an important oilseed, grown approximately due to its bio-efficacy, sustainability and eco-friendly 24 million ha throughout the world. It is a valuable Application of vermicomposting as an organic source is a cash crop planted by millions of small farmers because of ideal for soil and crop management. India is one of the economic and nutritional value. Its kernels are rich leading countries where vermicom post is widely applied source of edible oil (43.55%) and protein (25.28%).

2. MATERIALS AND METHODS

Enzyme assay:

Peroxidase test: 1g of fresh plant tissue extracted in 3ml of 0.1M phosphate buffer pH 7 by grinding with a pre-cooled mortar and pestle. Centrifuge the homogenate at 18000rpm at 5°C for 15 minutes. Pipette out 3ml of 0.1M phosphate buffer solution (pH 7.0), 0.05ml of 20mM guaiacol solution, 0.1ml enzyme extract and diluted 30% of 0.03ml hydrogen peroxide solution in a cuvette and mixed well. Enzyme activity (units/litre) = $\frac{3.18 \times 0.1 \times 1000}{6.39 \times 1 \times \Delta t \times 0.1}$

Catalases Activity: The plant tissue was blended with the M\150 phosphate buffer and centrifuged at 18000rpm for 15 minutes at 1-4°C. the supernatant was collected and treated for catalases activity. 3ml of hydrogen peroxide buffer, 0.01-0.04ml of sample was taken shaken well in a test tube and the absorbance was measured using spectrophotometer at 240nm. the absorbance should decrease from 0.45 to 0.40. the time interval for the decrease of the absorbance was calculated.

TLC: Thin-layer chromatography is a solid-liquid form of chromatography where the stationary phase is normally a polar absorbant and the mobile phase can be a single solvent or combination of solvents. TLC is a quiet, inexpensive micro scale technique that can be used. On all the chromatography techniques TLC is being choosn as interest in this study.

Procedure:

- The silica plate was made of 10cm*5cm and 0.25mm thickness.
- Make the margins at both the ends of the plate for 1.5cm. to the one end mark three spots namely a, b, c.
- Make the plant sample by crushing the leaves with acetone and load it on the three spots. Allow it to dry.
- Pour the developing solvent (ethanol 78ml/water 9.5ml/ ammonium hydroxide 12.5ml) into the tank for the depth of 0.5cm. allow it to stand still for 30-45minutes to bring the solvent to an equilibrium condition to the environment.

Place the silica plate in the way that the sample spots touches the solvent. Leave it for 1-2 hours and keep it closed. With the distance movement of the samples the rf value was calculated.



3. RESULTS**Changes in peroxidases enzyme activity on *arachis hypogaea* l.****Table.1. Changes in peroxidases enzyme activity on *arachis hypogaea***

SAMPLE	PEROXIDASES ACTIVITY
S 1	17.6
S 2	8.8
S 3	20
S 4	13
S 5	11.1
S 6	10.8
S 7	10
S 8	9.8
S 9	9.2
S 10	3.5

The enzyme activity increases with the increase in the fertilizer concentration and are proportional to each other.

Changes in catalases enzyme activity on *arachis hypogaea* l.**Table.2. Changes in catalases enzyme activity on *arachis hypogaea* l.**

SAMPLE	CATALASES ACTIVITY
S 1	46
S 2	26
S 3	30
S 4	27
S 5	23
S 6	19
S 7	12
S 8	9
S 9	8
S 10	2

The enzyme activity linearly increasing to the vermicomposting composition and shows more active reactions.

Thin-layer chromatography of *arachis hypogaea* l.

SAMPLE	Rf VALUE
Ground nut	0.998

**TLC plate**

TLC plate: The TLC for ground nut (*arachis hypogaea* L.) shows the above results.

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