Macronutrients in the selected extract of coir waste, banana leaf extracts and egg shell powder using preparation of vermicompost

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I. INTRODUCTION

Vermicompost is a bio- fertilizer, it is rich in nutritional content. It is used to promote the plant growth. Vermicompost is nothing but the waste product of earthworm. Earthworm utilizes the organic waste and produce vermi-cast. These vermicast are rich in nitrogen, phosphorus, potassium and sodium. Vermicompost is a simple biological process of composting in which certain species of earthworms are used to enhance the process of waste conversion and produce a better end product. About 2,350 years ago Aristotle has said, “Earthworms are intestine of earth” (Yadav and Mullah,2017).

Earthworms protect millions of ‘nitrogen–fixing’ and decomposer microbes in their gut these worms are major producer of natural manure without any factories and gift of farmers (Annapoorani,2014). Vermicomposting has been recently universally accepted as eco friendly technology for sustainable development and abatement of pollution caused by municipal, garbage, sewage, sludge, agricultural wastes. It is used as a best organic fertilizer in terms of nutritional quality and the impact on the growth of the fruit and plant.

Vermicompost is a process of decomposition of solid waste deposits by the aerobic activity of earthworm and microorganisms (Lim et al.,2016).The goals of Vermicomposting are to repeatedly increase the amount and weight of worms and to convert the substrate material into vermicompost within the shortest time and highest recovery as possible (Rupani et al.,2013).Vermiculture is a biological and non- biological waste,biofertilizer production and range of potential applications for future (Karmi et al.,2017).

Coconut is cultivated in more than 93 countries of the world in 12.05 million hectares. Among these India occupies third place with 1.89 million hectares producing 12.821 million nuts per annum (Rathinam P. 2005). The coir,one of the byproducts of coconut is used for the production of ropes, mats, bags etc., (Bhatt VS,1992).

Banana is an important food crop of India. We Indians use banana leave for having food and it is a part of our culture. Besides, Banana leaf waste is thrown out in huge amount from temples, market, marriage halls, residential address etc. It can be inferred from journals that high lignin content of banana leaf makes it little difficult for it to decompose (Alejangro et al.,2017). So it is important to give special attention towards the management of banana leaf waste. The study is this intended to find out the effect of vermicomposting on banana leaf waste which is very common waste in India, especially in South India.

Chick egg shells are poultry biowaste generated from hatcheries, house-holds, hotels and restaurants (RadhaT,Karthikeyan G,2019). Eggshell is rich in both organic and inorganic materials including macro and micro nutrients such as potassium, nitrogen, calcium, magnesium, Phosphorus, chloride and zinc which are essential for plant growth promotion. Crushed egg self-fertilizer provides the soil with calcium along with other nutrient content in them.

Study Area

For this study, the vermicomposting is prepared in the Adhiyaman arts and science college for women in

Kurusampatti village, Uthangarai taluk,Krishnagiridistrict,Tamil Nadu.

II. MATERIALS AND METHODS

The compost was prepared by using bin method with four trays. For this experiment four plastic tubs were maintained namely A,B, C,D (control soil,coir waste, banana leaf extract,egg shell powder).

An attempt has been made to provide vermicompost by using coir waste, banana leaf extract and egg shell powder.

- The collection of earthworms from garden soil
- Coir waste, banana leaf extract and egg shell powder is collected from the home.
- Prepare the vermicompost bed with coir waste, banana leaf extract and egg shell powder.

OBSERVATION

In our study the variations in the Nitrogen,Phosphorus and Pottassium have been observed in the taken samples

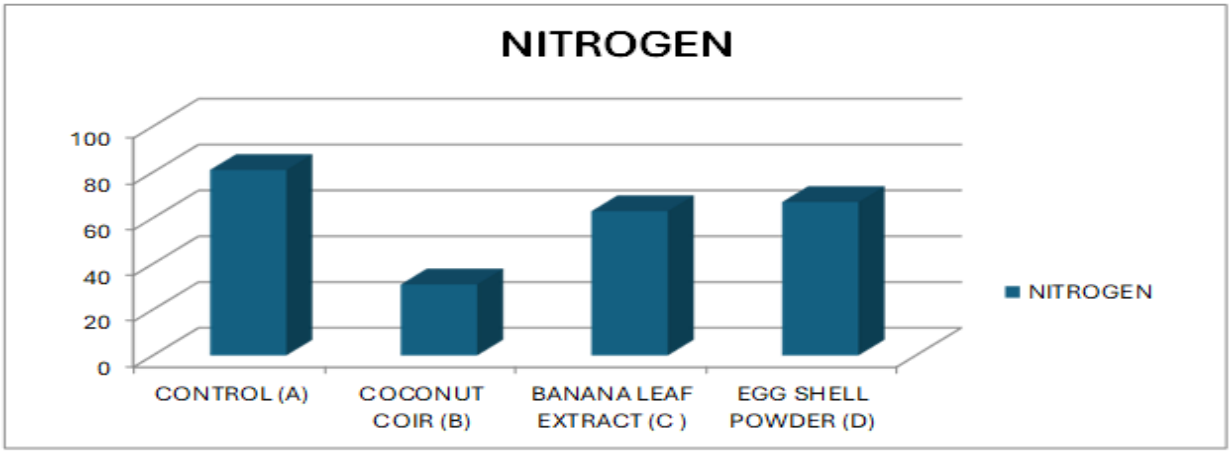
III. RESULT

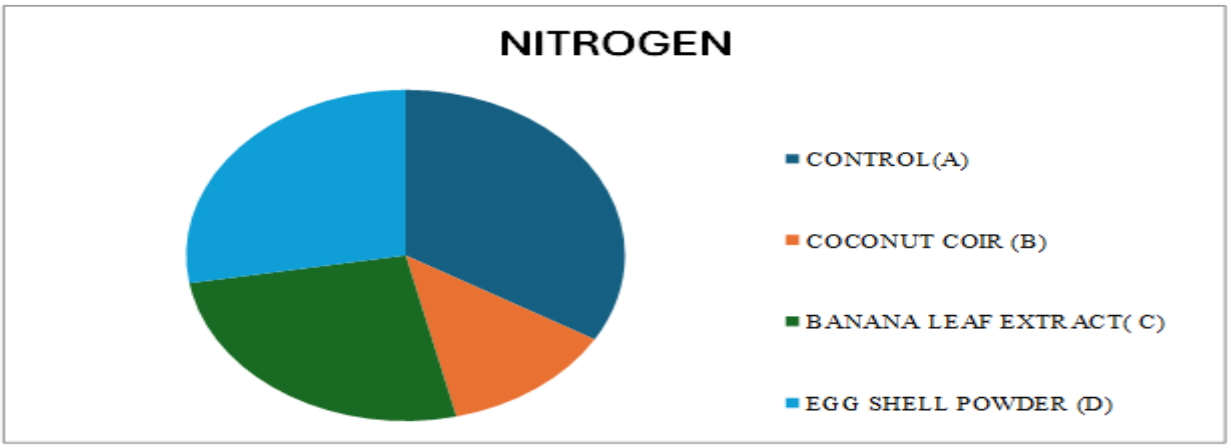
BEFORE MIXING OF EXTRACTS

NPK content of the selected soil samples were as below

Nitrogen:

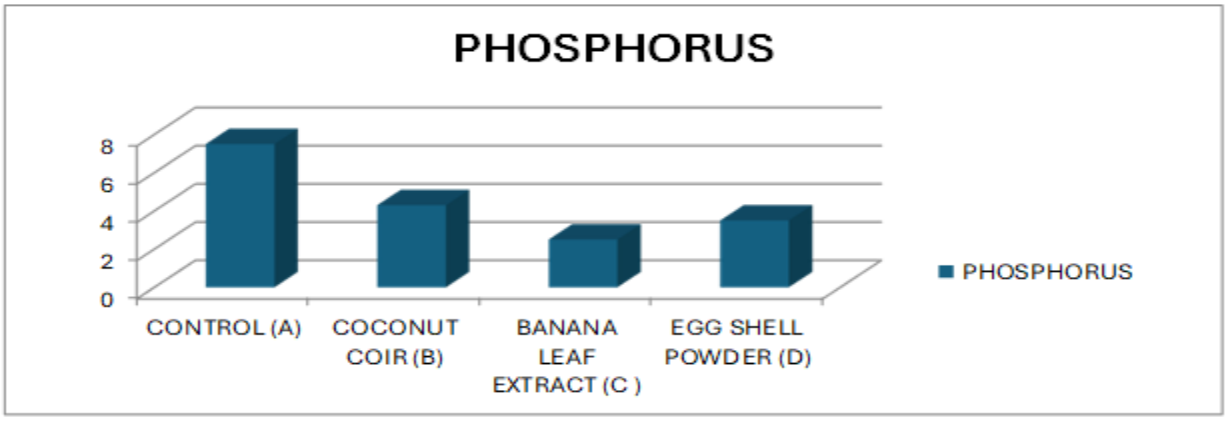
A	B	C	D
81	31	63	67

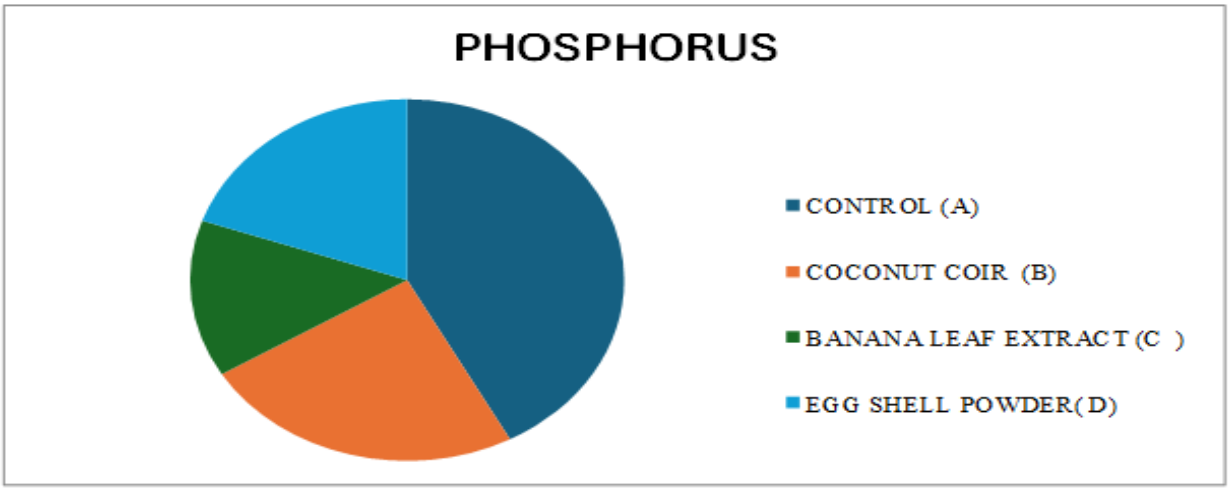




PHOSPHORUS

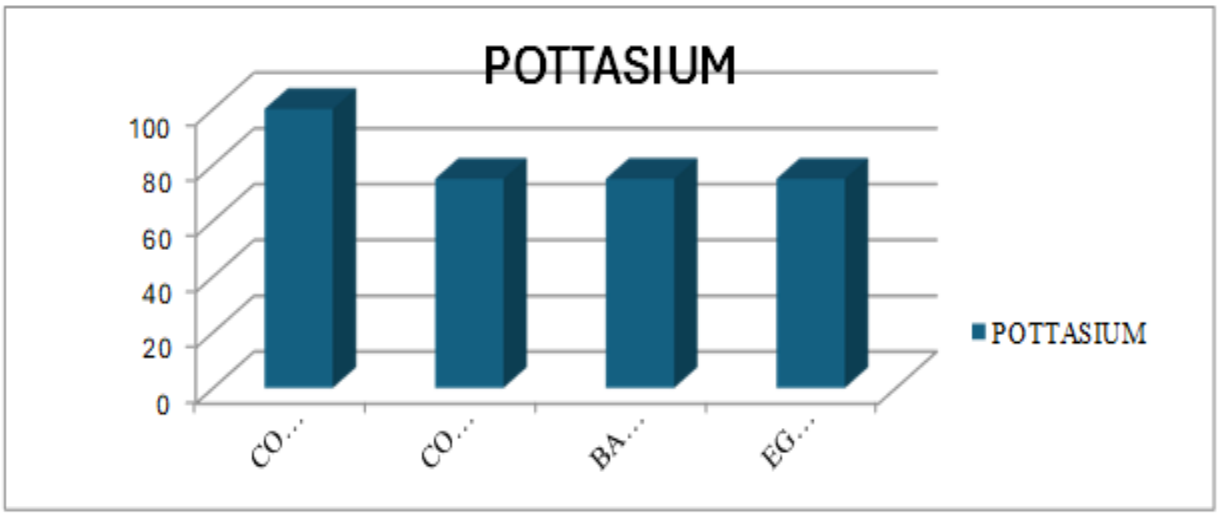
A	B	C	D
7.5	4.3	2.5	3.5

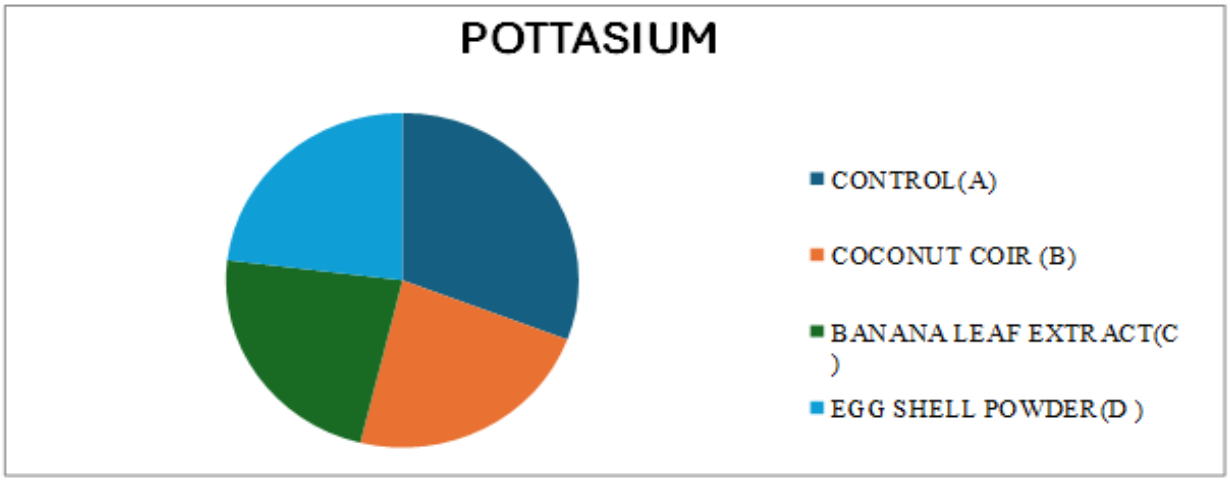




POTTASIUM

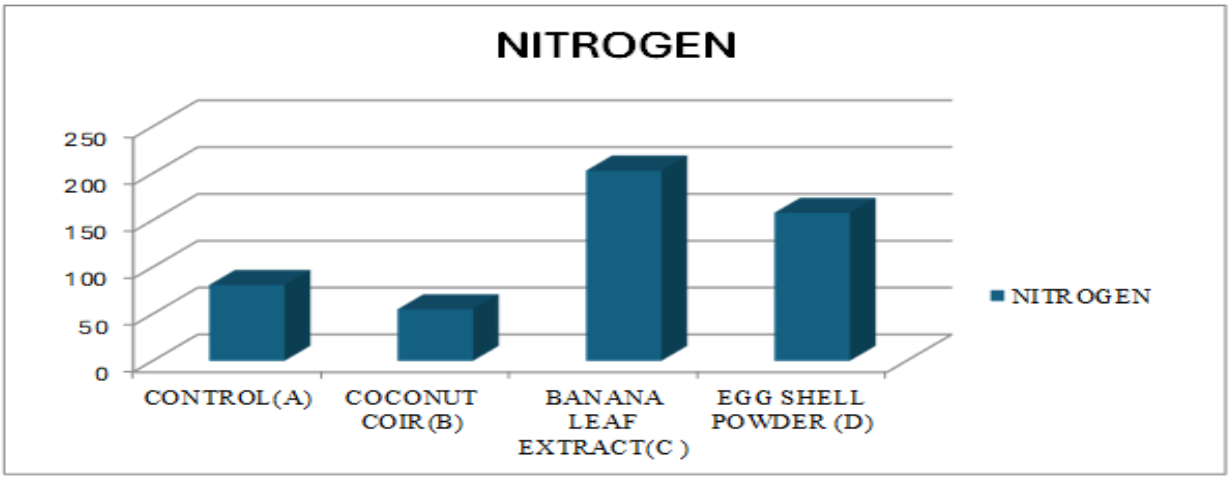
A	B	C	D
100	75	75	75

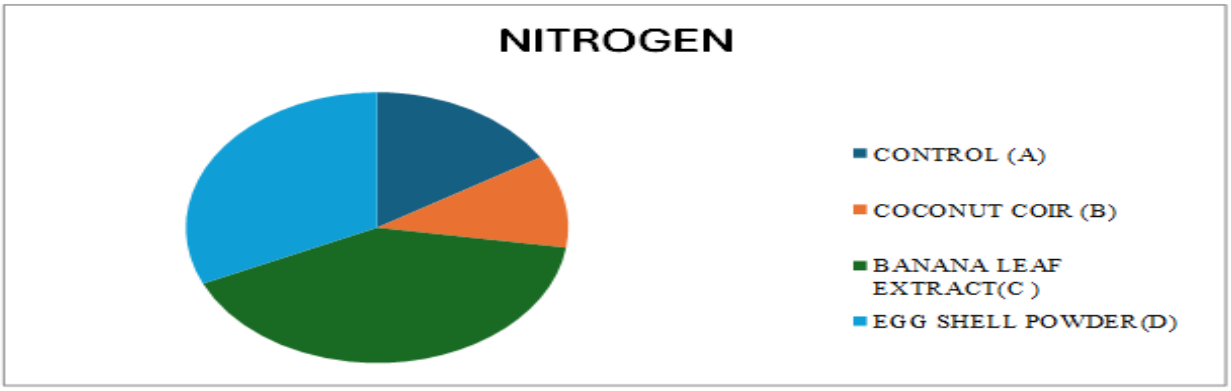




AFTER MIXING OF EXTRACT

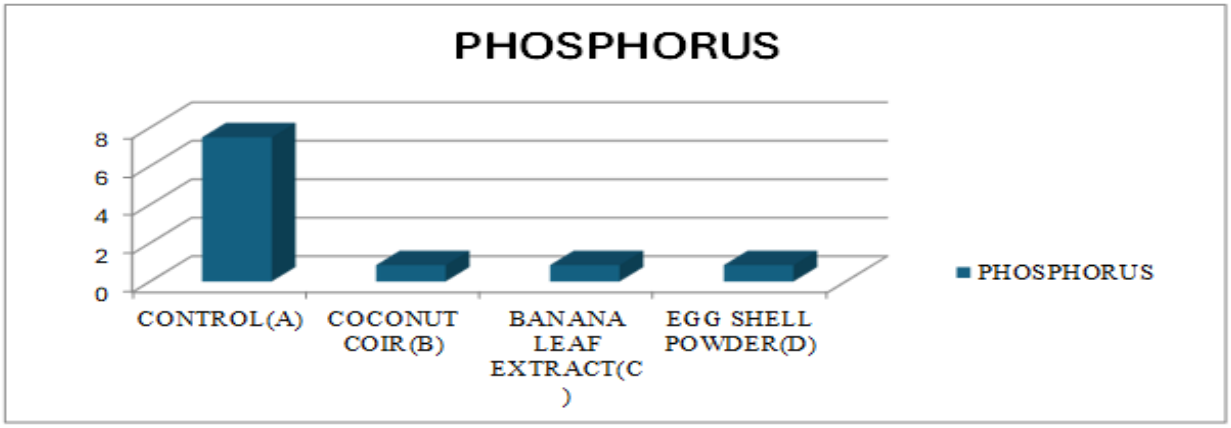
A	B	C	D
81	55	203	158

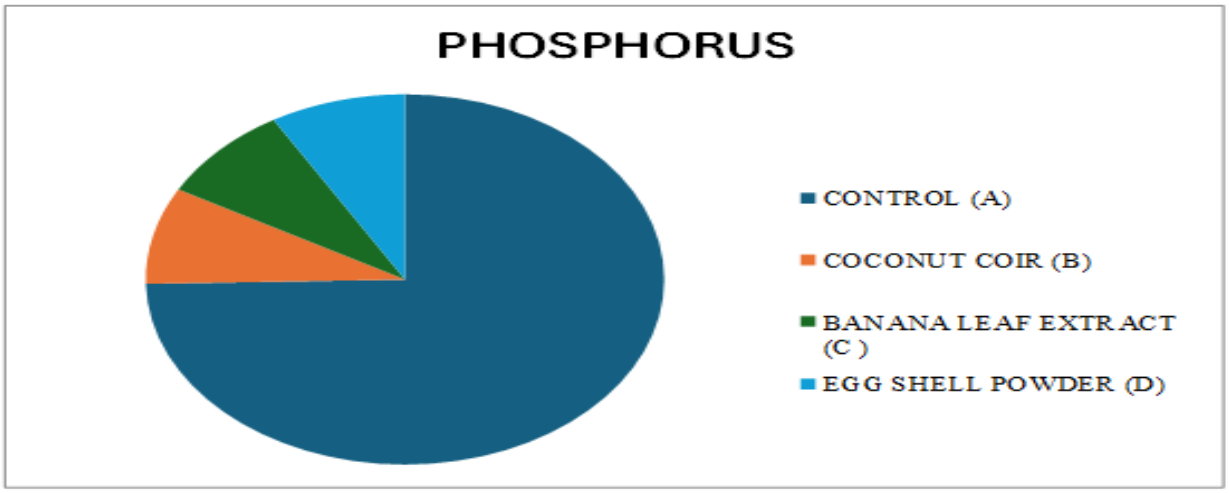




PHOSPHORUS

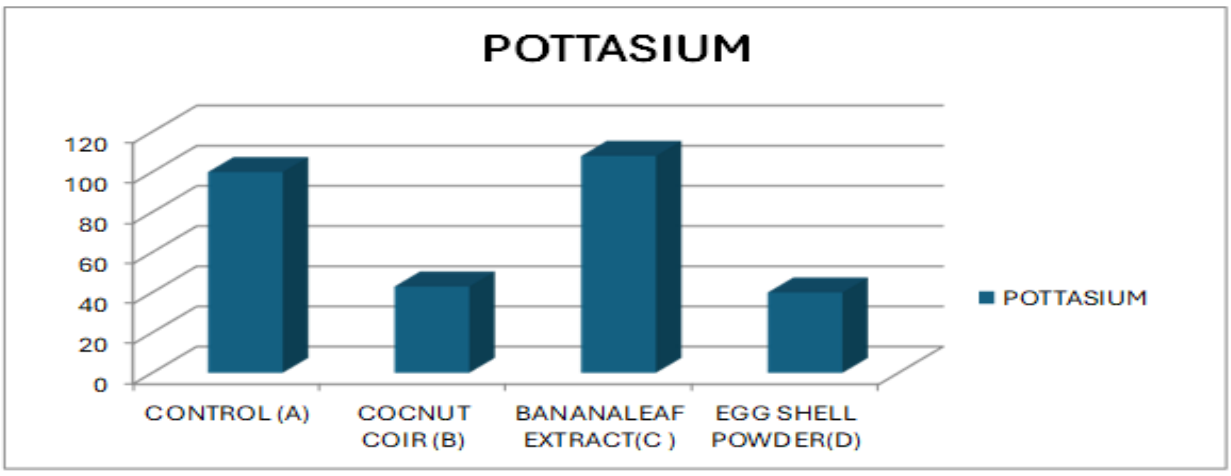
A	B	C	D
7.5	0.85	0.85	0.85

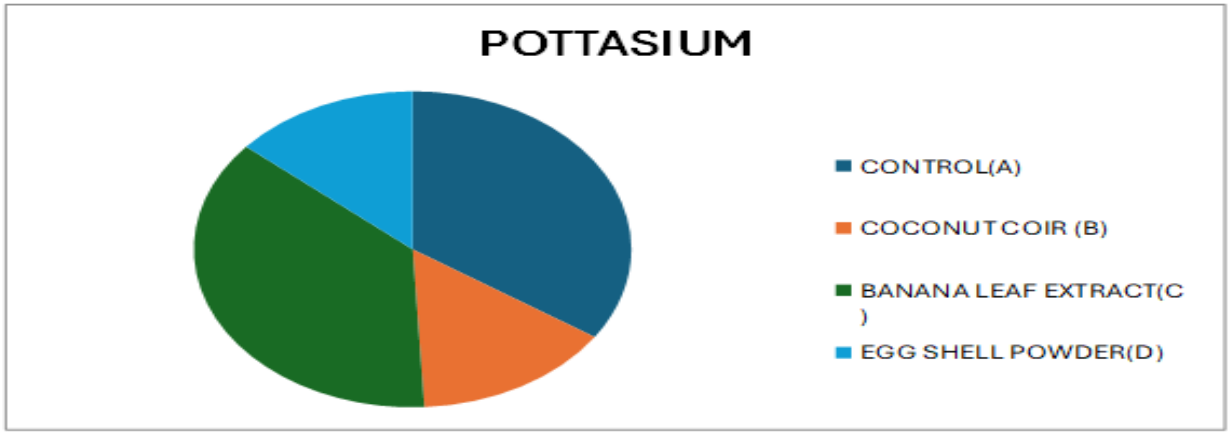




POTTASIUM

A	B	C	D
100	43	108	40

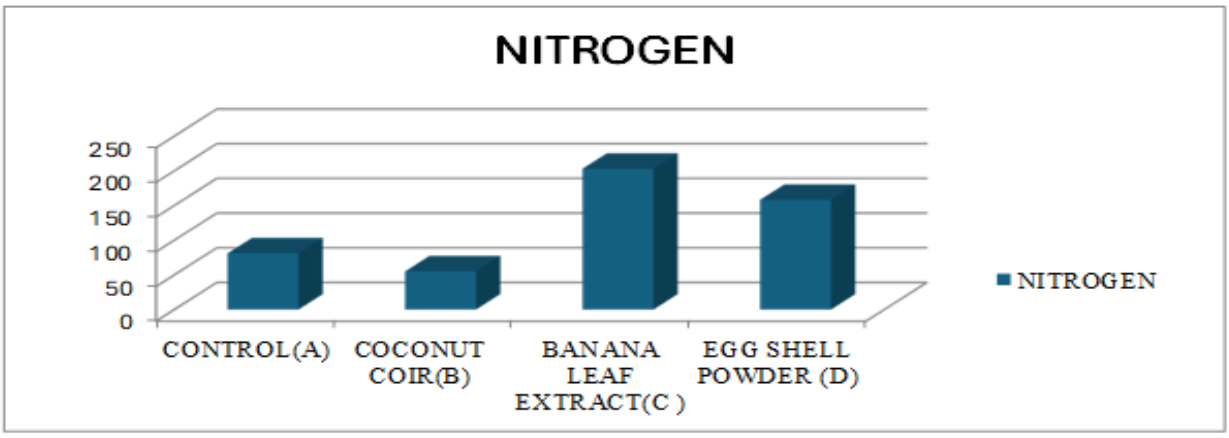


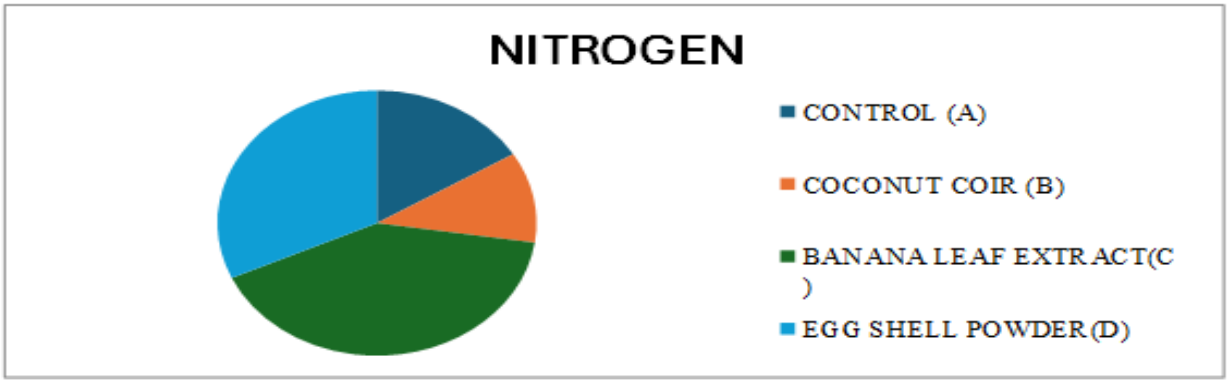


BEFORE INOCULATION OF EARTHWORM

NITROGEN

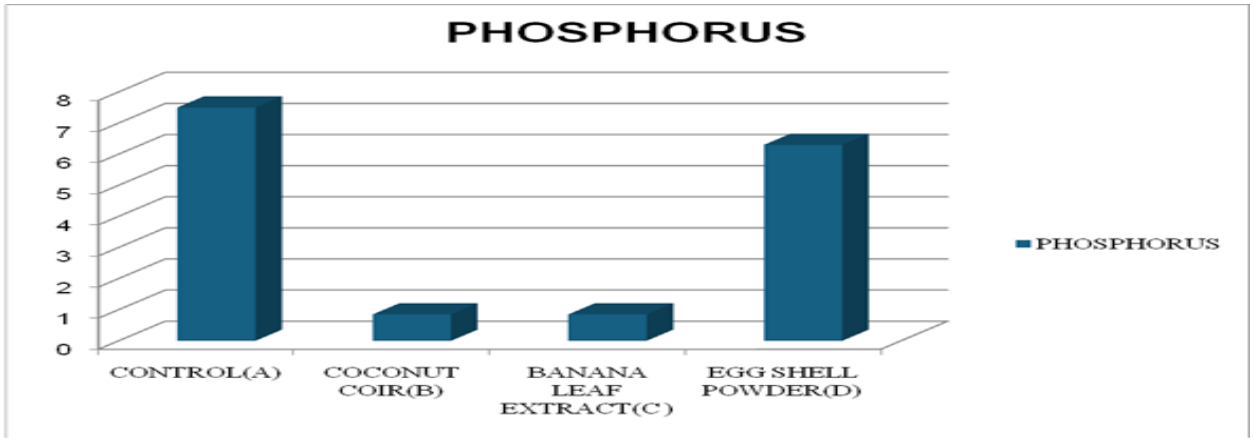
A	B	C	D
81	55	203	158

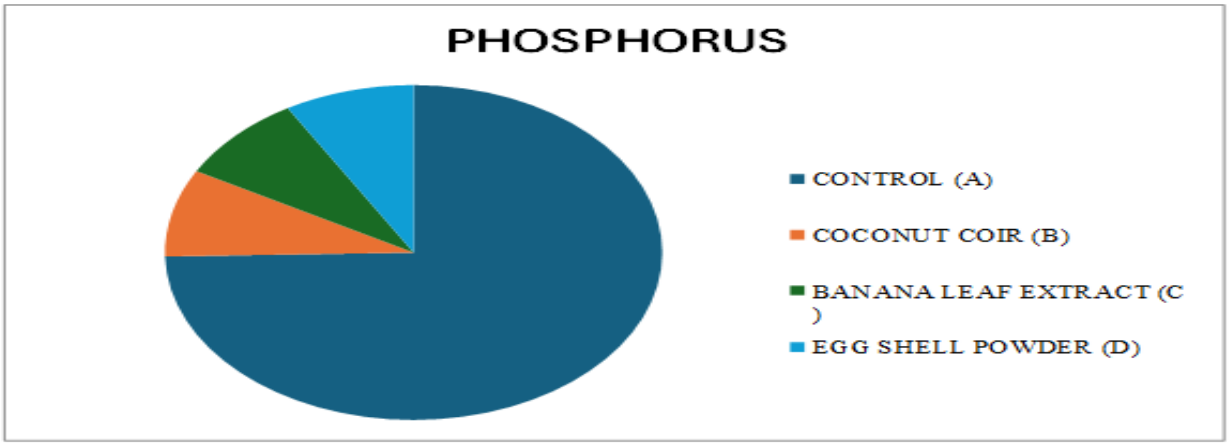




PHOSPHORUS

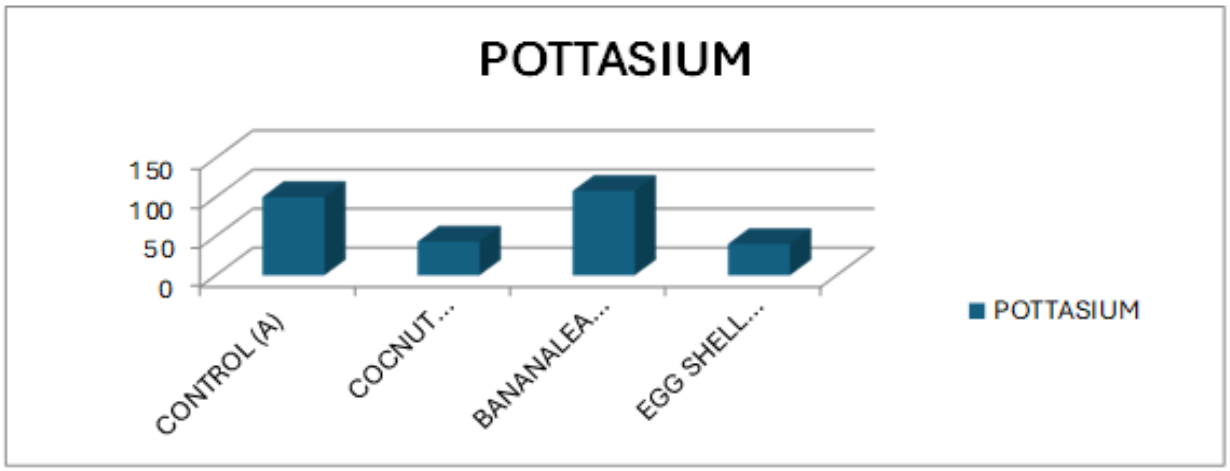
A	B	C	D
7.5	0.85	0.85	0.85

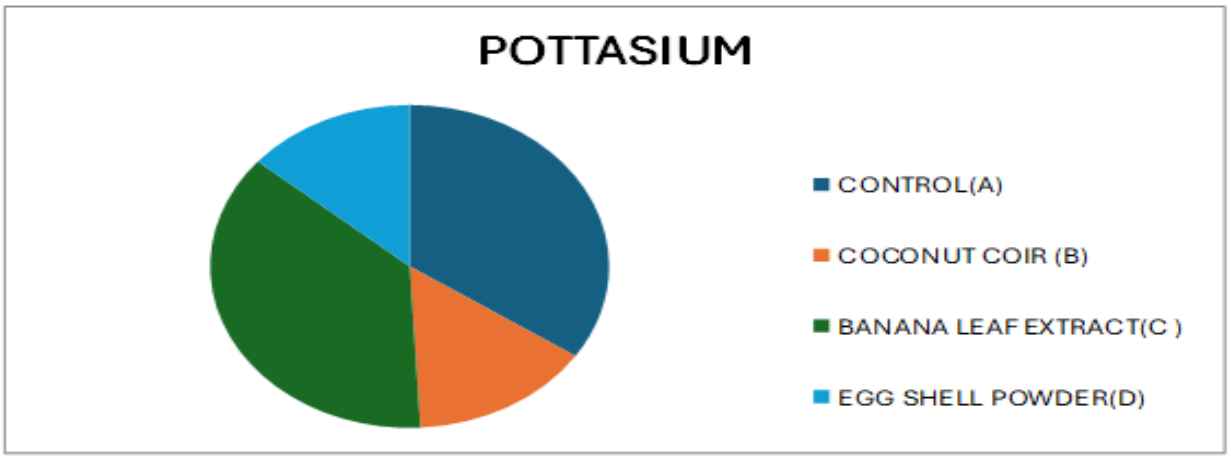




POTTASIUM

A	B	C	D
100	43	108	40

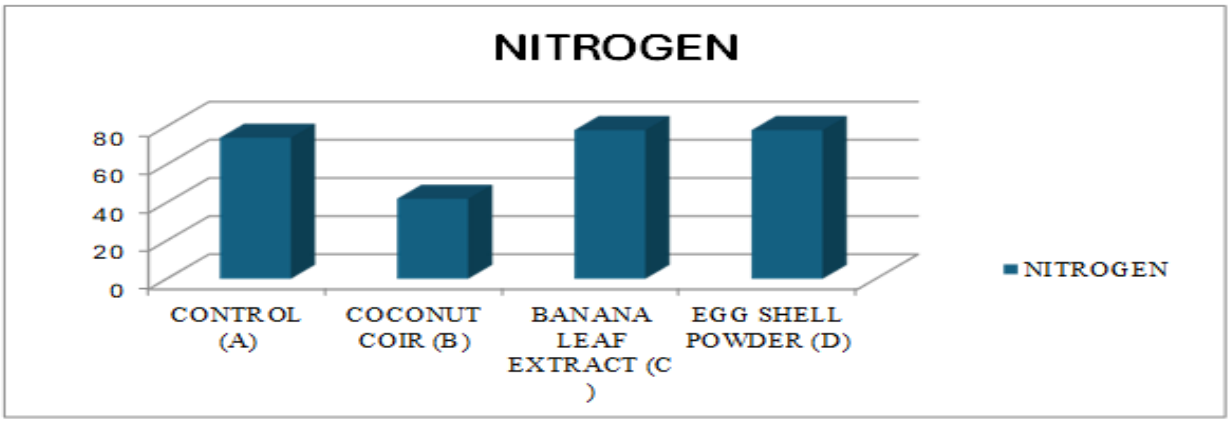


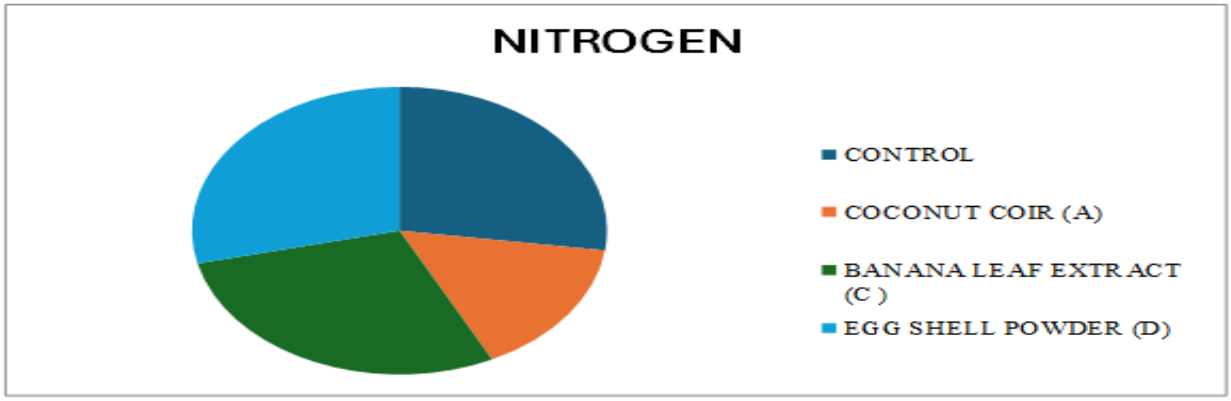


AFTER INOCULATION OF EARTHWORM

NITROGEN

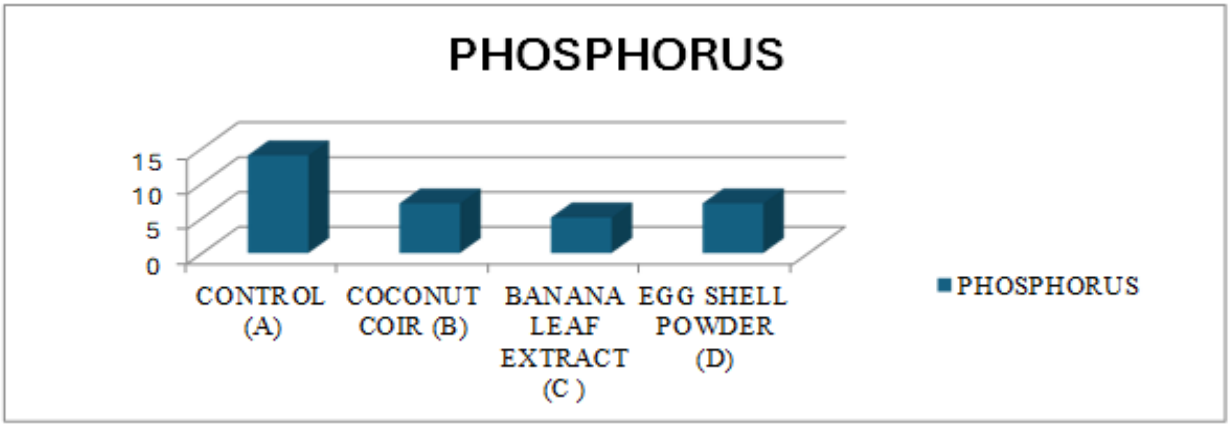
A	B	C	D
74	42	78	78

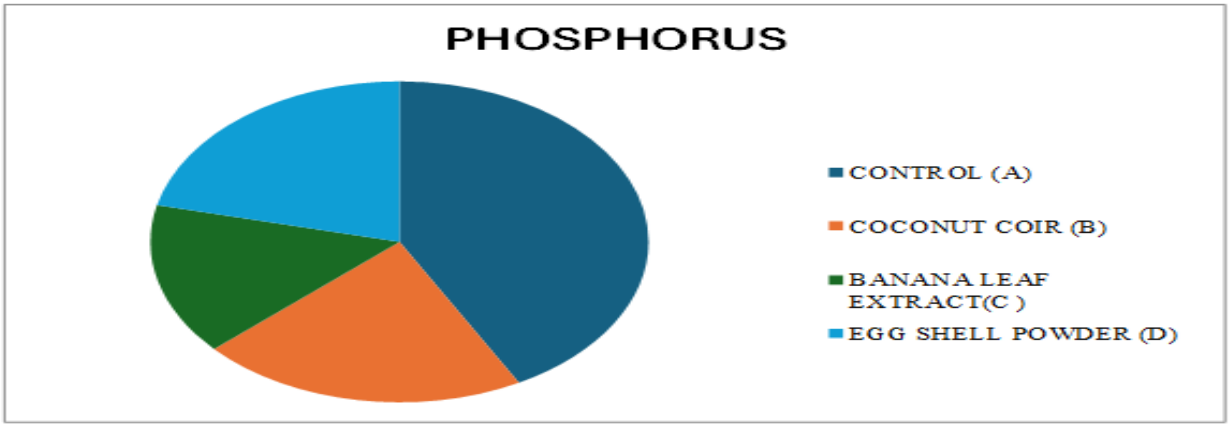




PHOSPHORUS

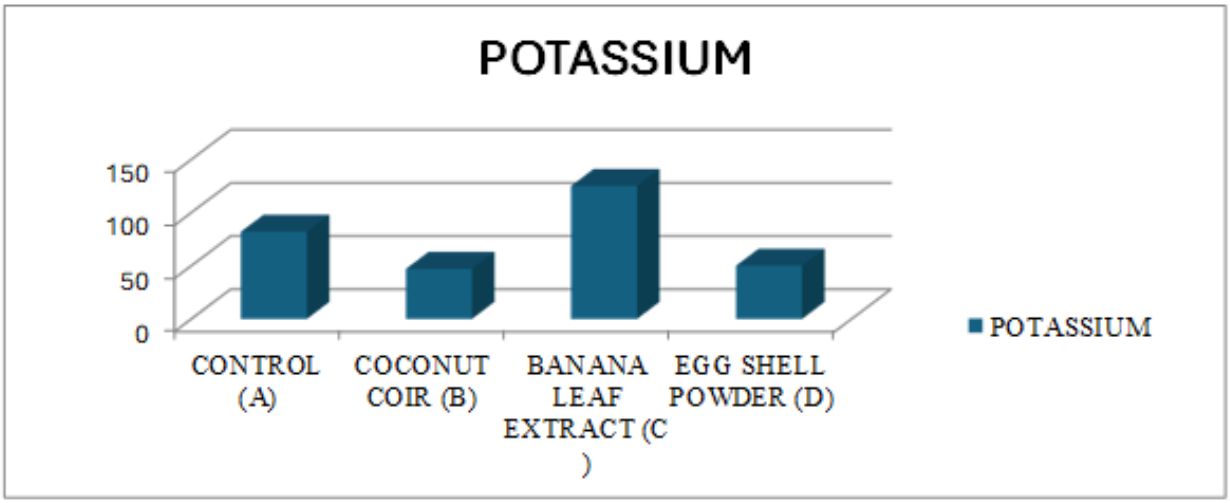
A	B	C	D
14	7.1	5.1	7.1

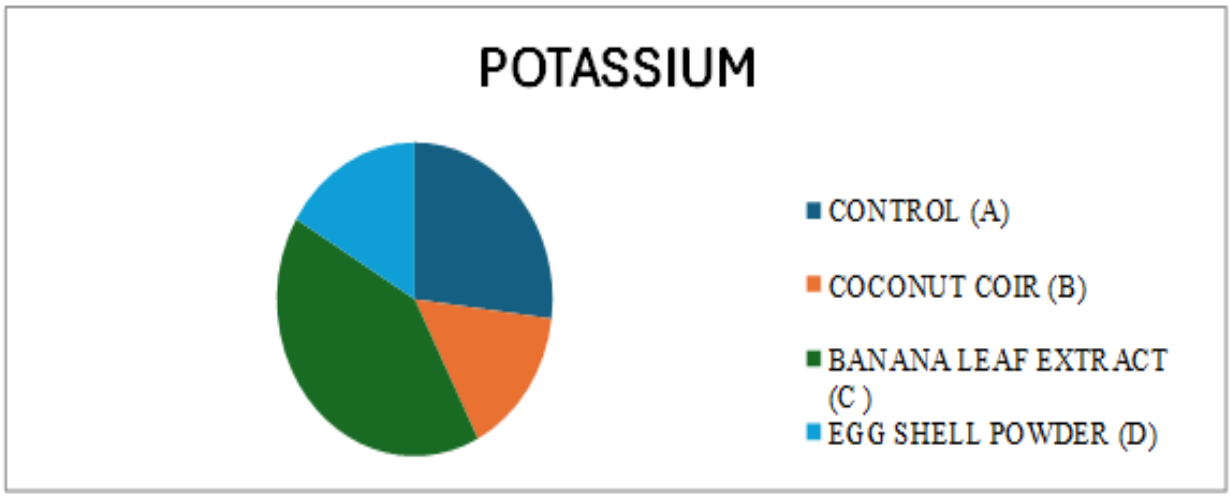




POTASSIUM

A	B	C	D
82	47	125	50

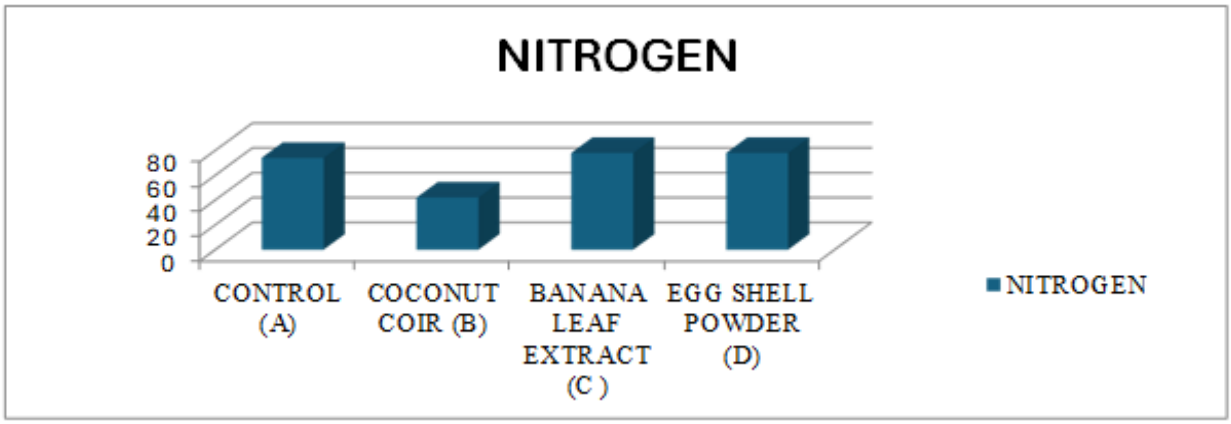


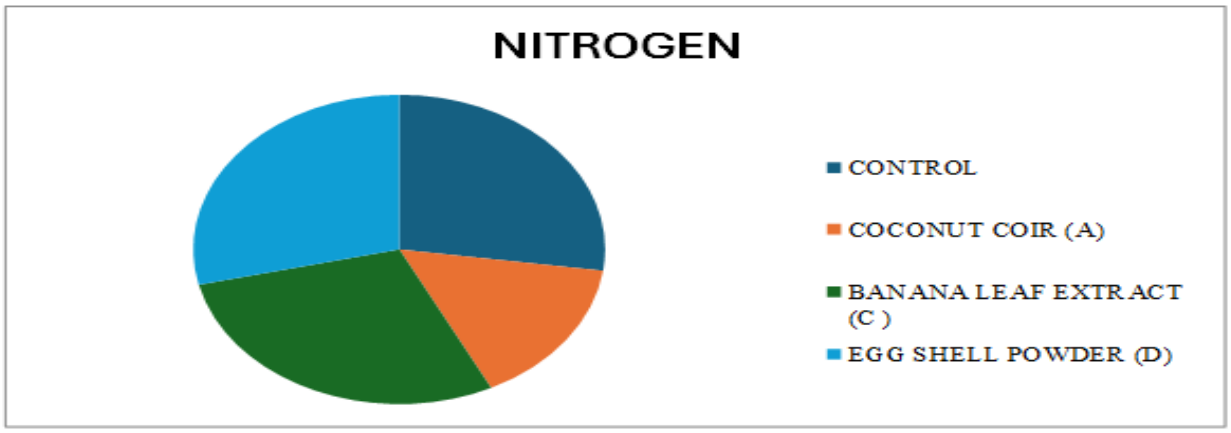


BEFORE PLANTATION

NITROGEN

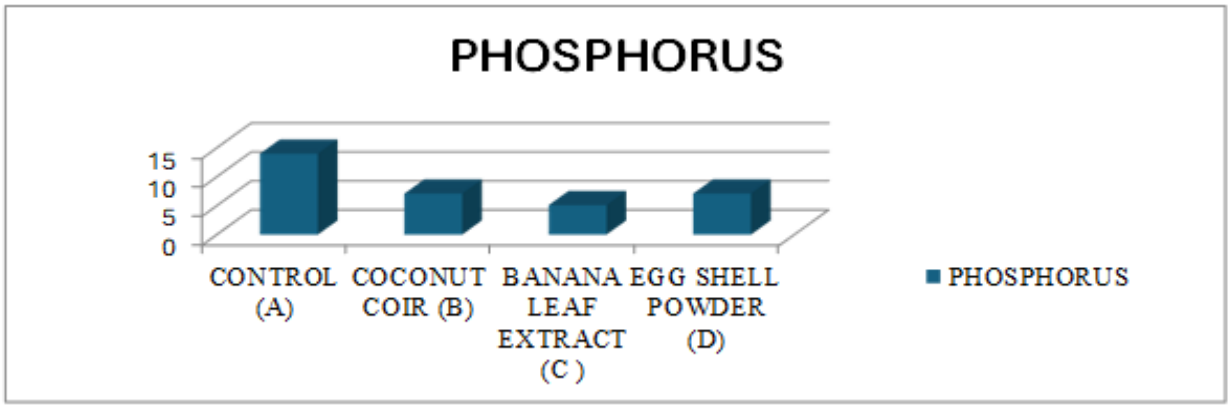
A	B	C	D
74	42	78	78

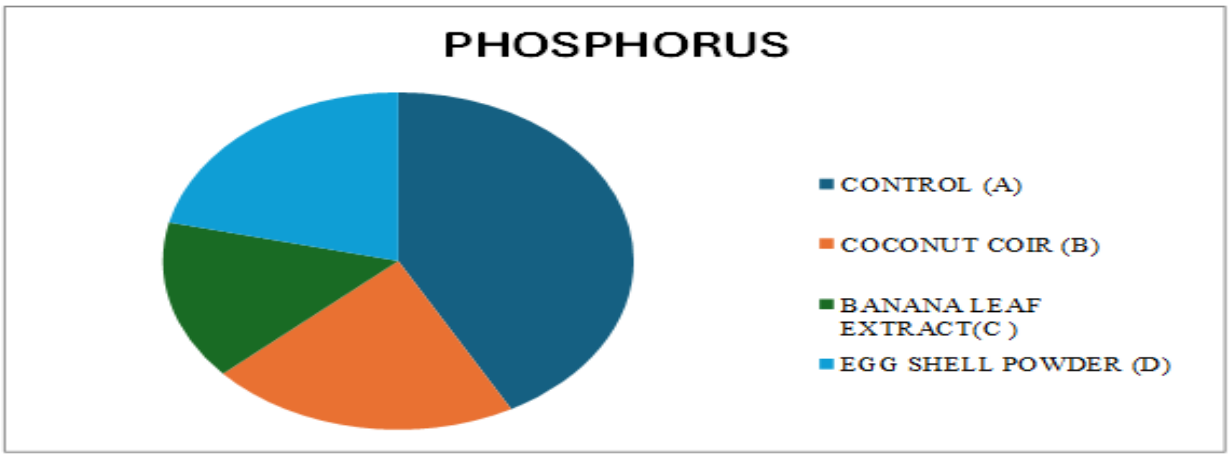




PHOSPHORUS

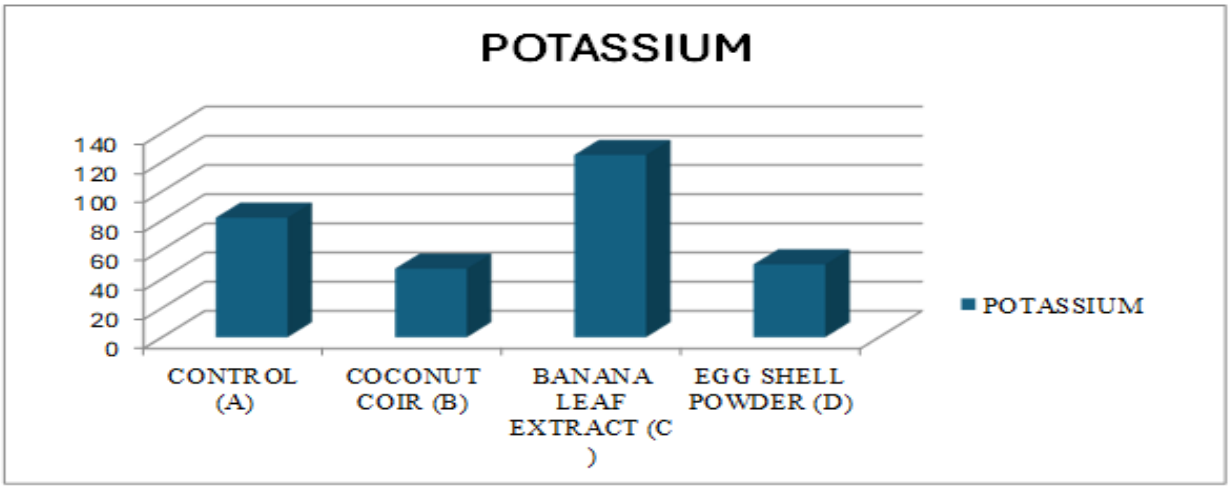
A	B	C	D
14	7.1	5.1	7.1

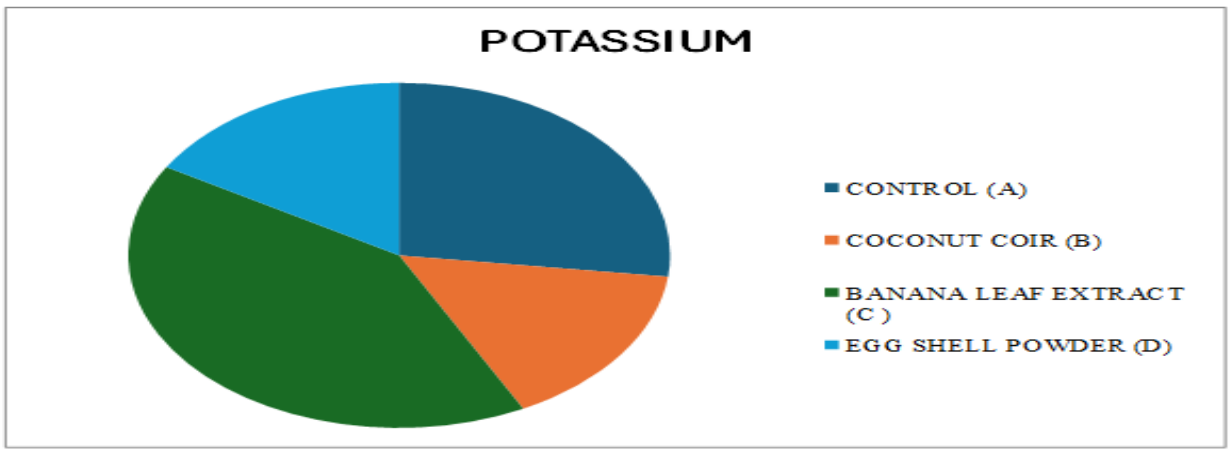




POTASSIUM

A	B	C	D
82	47	125	50

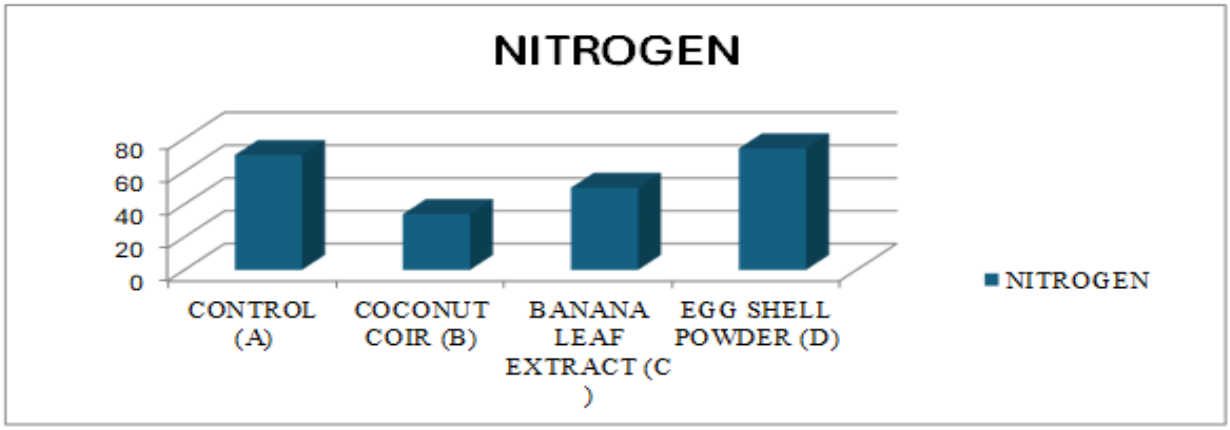


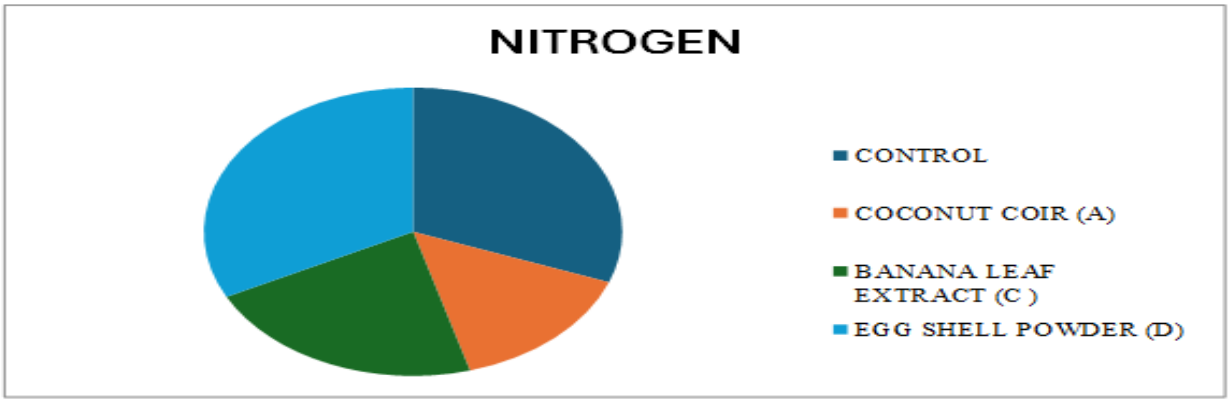


AFTER PLANTATION:

NITROGEN:

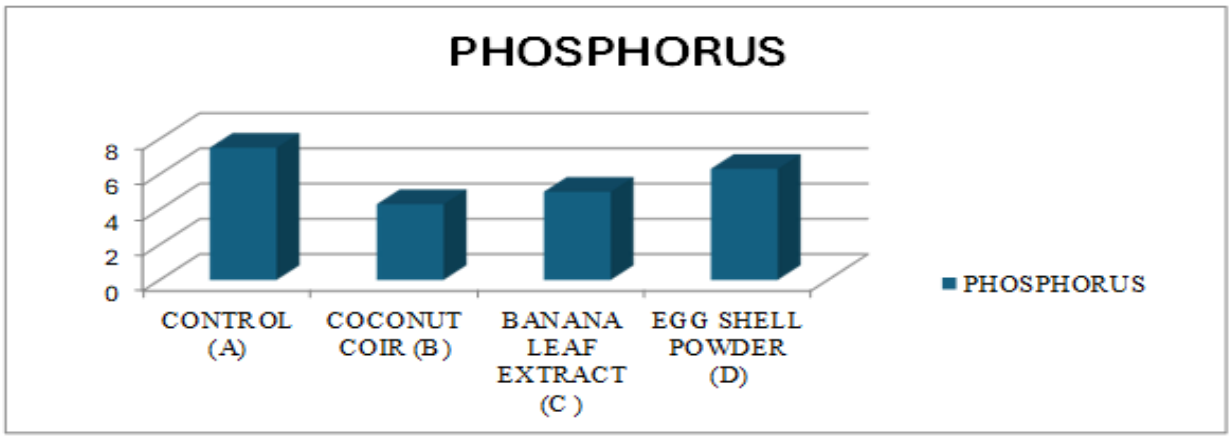
A	B	C	D
70	34	50	74

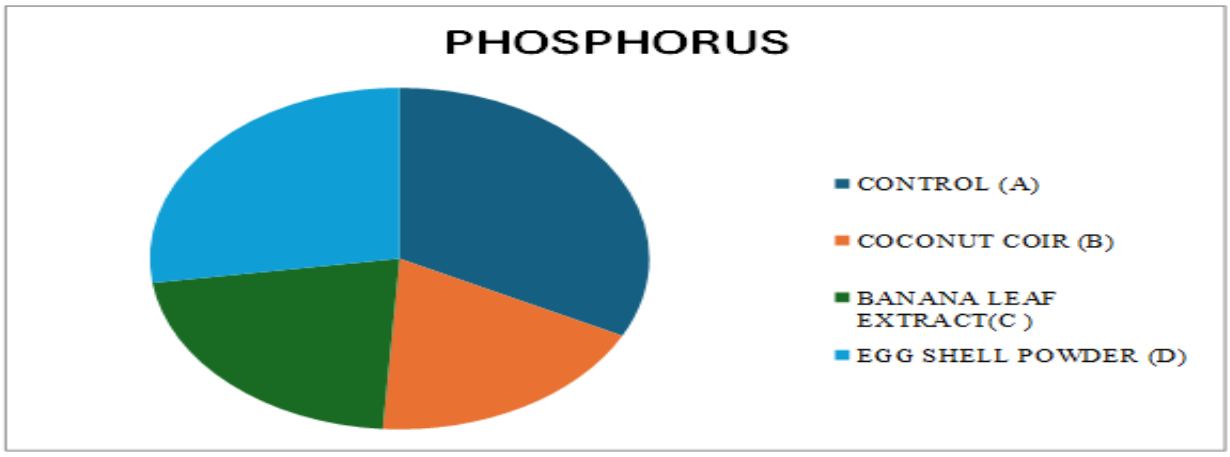




PHOSPHORUS

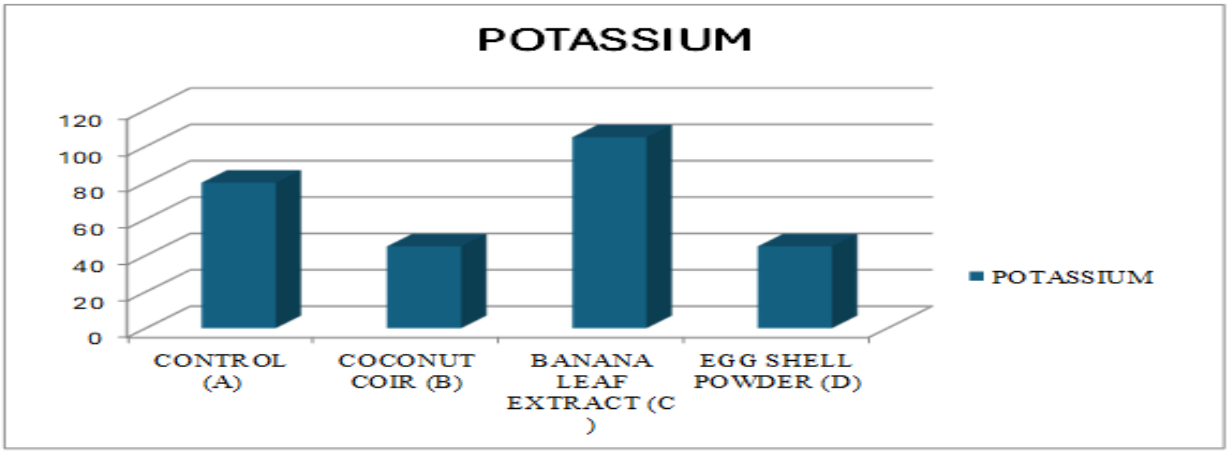
A	B	C	D
7.5	4.3	5	6.3

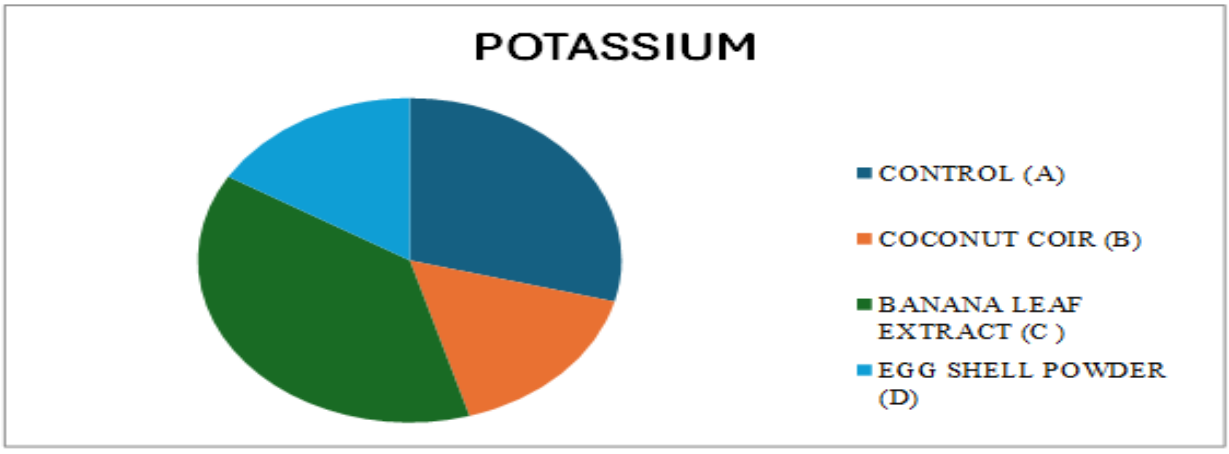




POTASSIUM

A	B	C	D
80	45	105	45





In our present study the result indicates the NPK content of the taken samples were high in the soil content after mixing the certain contents like coconut coir, eggshell powder and banana leaf extract.The increase in the NPK content indicates the extracts can be mixied throughly in the soil and also a good vermicompost by utilization of the the NPK in the soil shows the decreased amount after plantation

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