

## Research Article

# THE STUDY OF THE EFFECT OF DIFFERENT FERTILIZERS ON THE GROWTH OF COLEUS AROMATICUS

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### ABSTRACT:

*Coleus aromaticus* (Lamiaceae) is known as a must-have plant in medicinal herb garden. The plant is well known for its antimicrobial and pharmacological activities. It is also reported to possess antioxidant and food additive properties. This study was to determine the effect of different fertilizers on the growth of *Coleus aromaticus*. The results revealed that bio compost was the best fertilizer for the growth of *Coleus aromaticus*.

**Key words :** *Coleus aromaticus*, fertilizers

### INTRODUCTION

Plants as medicine have been in use from thousands of years and continuing are in use. Plants are good source of a wide variety of compounds, such as phenolic compounds, terpenoids, nitrogen containing compounds, vitamins, and secondary metabolites which have antioxidant, antimicrobial, anti-inflammatory, antitumor, anti mutagenic, anti-carcinogenic and diuretic activities.

Among the plants known for medicinal value, the plants of the genus *Coleus* belonging to the family Lamiaceae or Labiatae are well known for their therapeutic potentials.

*Coleus* species are found as herbs, sub shrubs or shrubs. They are often succulent with opposite leaves. Inflorescence is terminal or in the upper leaf axils and flowers are in compact cymose clusters.

*Coleus aromaticus* looks as a green, perennial, shrub having heart shaped, and leathery leaves with scalloped edges (figure 1). The plant grows to around 50 cm tall with horizontal stems up to 180 cm long. The leaves are highly aromatic with a strong flavor of mixed herbs .



### **BIOLOGICAL ACTIVITIES**

The plant is used more commonly as medicinal herb due to its antioxidant property and therapeutic value. Juice of leaves is effective to cure constipation and other digestive disorders like indigestion, stomach ache and congestive heart failure. Leaf extract is given in bronchitis, asthma, cold, chronic cough and epilepsy. Used for curing cholera also in treatment of fever or infections. Leaf is used for the treatment of headache and also in burns.

### **AIM AND PLAN OF WORK**

The three exogenous factors like soil, climate and fertilizers affect the growth and contents of the plant. The current study was designed to find out:

- (a) Effect of different fertilizers on the growth of *Coleus aromaticus*.
- (b) Effect of different fertilizers on the production of volatile oil in *Coleus aromaticus*
- (c) Effect of different fertilizers in the content of phytoconstituents by determining the Ash values, Extractive values and Foreign organic matter.
- (d) Effect of plant hormones on the growth ie, with Auxin

The plants were cultivated under controlled climatic conditions and the contents of constituents were determined by different physical methods

### **MATERIALS AND METHODS**

*Coleus aromaticus* was cultivated by planting stem cuttings.

- Whole stem cuttings were used for planting and well developed healthy and disease free stem cuttings were selected from Thiruvananthapuram.
- Small pits were made and filled with well decomposed cattle manure, stem cuttings were placed over it and covered with soil. The soil was mixed with a little portion of sand .

**Manuring and Fertilizer application**

Biocompost, NPK, Bone meal and Urea were added.

**Weeding and irrigation**

Weeding was done thrice at 60,90,120 days after planting depending on the weed intensity.

First light irrigation was given after planting.

Second light irrigation was given 3-4 days after planting.

Then irrigation was done at 8 -10 days interval.

Water stagnation was avoided during rainy season.

- Prepared 10 garden pots each having a top diameter of 20 cm , bottom diameter of 10 cm and a height of 25 cm.
- Small pits were made and filled with well decomposed cattle manure, seed rhizomes were placed over it and covered with soil. The soil was mixed with a little portion of sand .
- The pots were grouped into five so that each groups contain 2 pots.

**Group A**

Serve as control pots were filled with soil, cattle manure and sand .No fertilizer was added.

**Group B**

The pots were filled with soil, cattle manure and sand. Fertilizer Biocompost was used (50g/pot).

**Group C**

The pots were filled with soil, cattle manure and sand. Fertilizer Bone meal was used (50g/pot).

**Group D**

The pots were filled with soil, cattle manure and sand. Fertilizer NPK was used (50g/pot).

**Group E**

The pots were filled with soil, cattle manure and sand. Fertilizer Urea was used (50g/pot).

Light irrigation was given to all the 10 pots. Pots were placed in shade and named the pots.

- The healthy and viable stem cuttings were transplanted to the prepared pots.
- Weeding was done and the growth was observed. length, spread ability and no. of leaves were recorded after one month and three month
- Weeding was done and the growth was observed and checked the disease
- The cultivated *Coleus aromaticus* plants were collected .
- The adhered soil and sand were removed by washing or running tap water.
- Biomass was determined by using an electronic balance.
- All those values were compared.





**EXTRACTION OF VOLATILE OIL FROM *COLEUS AROMATICUS***

Accurately weighed quantity of *Coleus aromaticus* leaves, 300ml of water was taken in a 1000ml round bottomed flask. Added a few pieces of small porous earth ware into it. The round bottom flask was fitted with a clavenger apparatus and reflux condenser. Heated on a water bath for 3 hours. After the distillation has been carried out for further one more hour, the volume of oil in the graduated portion of the tube was recorded. This yield of volatile oil is taken as volatile oil in the drug.

**RESULTS AND DISCUSSIONS**

**DIAMETER OF LEAVES**

Pot B with fertilizer Bio compost showed highest dimensions and Pot C with urea as fertilizer showed least dimensions.

<b>POTS</b>	<b>LENGTH(cms)</b>	<b>BREADTH(cms)</b>
A(control)	6.3	5.5
B(biocompost)	11.4	10.4
C(bone meal)	10.0	8.2
D(NPK)	7	6.1
E(urea)	6.3	4.9



BIOCOMPOST

BONEMEAL

NPK

UREA



CONTROL

**BIOMASS**

The Pot B obtained the high yield provided with fertilizer Biocompost which also shows more spreadability comparing to other pots.

POTS	WEIGHT(g)
A(Control)	225.7
B(biocompost)	1030.44
C(bonemeal)	820.36
D(NPK)	750.37
E(Urea)	470.516

**VOLATILE OIL CONTENT**

The volatile oil content was more for Pot B with fertilizer Bio compost and less for Pot C with fertilizer Bone meal.

POT	PERCENTAGE YIELD
A(Control)	0.55 ml
B(Biocompost)	0.61 ml
C(Bonemeal)	0.59 ml
D(NPK)	0.58 ml
E(Urea)	0.49 ml

**DISCUSSION,SUMMARY AND CONCLUSION**

The climatic condition and soil nature are suitable for the cultivation of *Coleus aromaticus* in Thiruvananthapuram district, Kerala State. As far as an average yield is concerned, a total of 1000g of C plants were collected.

Out of all the pots provided pots with Biocompost fertilizer showed maximum yield.

All the physical ,chemical parameters revealed that *Coleus aromaticus* was suitable for cultivation in garden pots,best suited in the climatic conditions and Biocompost was the best fertilizer which provided maximum yield of volatile oil.

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