



Assessment of plant growth activity in Panchagavya using *Solanum melongena*

S. Gayathri Devi¹, V. Mary Kensa¹, R. Mahesh^{2*}

¹Department of Botany, S. T. Hindu College, Nagercoil – 629 002, Tamil Nadu, India.

²Manonmaniam Sundaranar University, Tirunelveli – 627 012, Tamil Nadu, India.

*Corresponding Author: R. Mahesh

*e-mail: rmaheshbio@gmail.com

Abstract

Organic agriculture is based on the principles of health, care for all living beings and the environment, ecology and fairness. Organic farming offers a sustainable and environmentally friendly approach to food production. While it has its challenges, the benefits for both the environment and human health make it a valuable option for consumers and farmers. Panchagavya is a potent organic fertilizer and pesticide derived from five cow products: cow dung, cow urine, cow milk, cow curd, and cow ghee and other supportive ingredients. Panchagavya is a single organic fertilizer was prepared and used in the experiment for the plant growth. In this study, green brinjal is used for the plant growth. The plant growth characters were investigated such as plant height, root length, shoot length, number of leaves and leaves width. The growth effects were analysed and the treatments was superior over the control. 2.5 % Panchagavya was recommended as a doses for plant growth.

Keywords: Panchagavya, Organic Fertilizer, Egg Plant.

Introduction:

Organic farming is an agricultural system that promotes sustainability, environmental health, and social well-being by relying on natural processes and avoiding synthetic inputs. It emphasizes the use of biological fertilizers, crop rotation, and natural pest control methods to maintain soil fertility and ecosystem balance. Organic production systems are based on specific standards precisely formulated for food production and aim at achieving agro-ecosystems, which are socially and ecologically sustainable (Venkateswarlu et al. 2008). It produces fine and healthy food product. It improve the fertility and quality of soil. Organic farming also known as ecological farming or biological farming. Organic farming helps in reducing the soil pollution and the air pollution. India has the most organic farmers in the world wide. Organic agriculture can be defined as "an integrated farming system that strives for sustainability, the enhancement of soil fertility and biological diversity while, with rare exceptions, prohibiting synthetic pesticides, antibiotics, synthetic fertilizers, genetically modified organisms, and growth hormones". Organic agriculture is based on the principles of health, care for all living beings and the environment, ecology and fairness. The most widely practiced organic farming system in ancient India uses Panchagavya, Vermicompost and farmyard manure for nutrient management and soil enrichment. It has been used for generations in enriching and improving the soil and provides health benefits for both humans and animals (Sumathi 2022). Panchagavya is the organic product, represents like milk, urine, dung, ghee and curd derived from cow. In Ayurveda, Panchagavya treatment is termed as 'cowpathy'. (Bajaj et al. 2020). It helps to build a healthy population complete nutritional requirement, eradicate poverty, pollution free environment and organic farming. Panchagavya is the natural fertilizer and made from natural ingredients. It is a single input that induce the plants produce larger leaves and develop denser canopy. The stem produces lateral shoots and much more sturdy branches to bear heavy yields (Siva Kumar, 2014). In this study, we will assess the effect of Panchagavya on the growth of *Solanum melongena*.

Materials and Methods:

In this panchagavya was prepared using cow dung, cow urine, cow ghee, cow milk, cow curd, tender coconut water, toddy, jaggery, bananas, and of fertile soil in appropriate proportion. In this 1st day of preparation, Mix cow dung and cow ghee in the drum using your hand. Cover the drum with a thick cloth to protect it from insects, sunlight, and rain. Stir the mixture twice daily (morning and evening) using a non-metal utensil. Avoid vigorous stirring. Add cow milk, cow curd, cow urine, tender coconut water, toddy, dissolved jaggery, mashed bananas, and fertile soil to the mixture. Stir the mixture daily, especially during sunrise and sunset. Stir in a clockwise direction. After 21 Days, the mixture will have fermented and the bad odor will subside. In eggplant, the panchagavya was sprayed as an organic fertilizers in 2.5% dilution. The plant was sprayed in interval of 10 days. The data on growth parameters and yield attributes were pooled and presented as Mean \pm S.E.

Results and Discussion:

The impact of panchagavya on the plant leaves length of Green brinjal was presented in Table from 1 to 8. Significant variation was observed on the plant leaves length when the field was incorporated with panchagavya. At the 70 days, treated plant leaves height 16.26 cm as compared to control. The lesser plant leaves height 7.25 cm was observed in the

control. In 60 days, it was observed that leaves width of plants varied from 2 to 3 cm per plants. The experiment plant leaves width height is more than compared to control. The stem length of 40 days was significantly higher in compared to control. Presence of naturally occurring beneficial and effective microorganisms, predominantly lactic acid bacteria, yeast, actinomycetes, photosynthetic bacteria, and certain fungi were improved with panchagavya treatment (Sailaja et al. 2014). The beneficial microorganisms from panchagavya and their establishment in the soil improved the sustainability of agriculture the beneficial microorganisms present in the rhizospheres environment around the plant growth and crop yield (Beaulah et al. 2001). On yield attributes of vegetables Number of fruits yield on plants all the treatments showed better performances in inducing fruit number and yield per plant over Control. Fruit number was increased as high in Green brinjal treated with panchagavya. Panchagavya individually also Contributed significantly in enhancement of fruit Number and yield in all crops. In this study concluded, panchagavya is a best alternative to maintain sustainable agricultural production without affecting the natural ecosystem. It has the potential to improve plant growth by supplying nutrients, amino acids, vitamins, growth regulators, and beneficial microorganisms. Besides improving plant growth, it also augments the plant defence to various environmental stress. With this immense mechanism, panchagavya could be a better organic plant growth promoter for sustainable agricultural production

Table: 1 Growth Parameters of Green Brinjal 10th Day

S. No	Parameters	Control	Experiment
1.	Leaf length	4.7 ± 0.31	5.42 ± 0.04
2.	Leaf width	3.6 ± 0.30	4.36 ± 0.12
3.	Stem length	6.7 ± 0.30	8.28 ± 0.09
4.	No. of leaves	3.5 ± 0.25	3.2 ± 0.12
5.	Root length	1.4 ± 0.07	1.22 ± 0.09

Table: 2 Growth Parameters of Green Brinjal 20th Day

S. No	Parameters	Control	Experiment
1.	Leaf length	5.1 ± 0.31	6.06 ± 0.15
2.	Leaf width	4.88 ± 0.15	6.8 ± 1.70
3.	Stem length	7.3 ± 0.30	10.12 ± 0.15
4.	No. of leaves	3.5 ± 0.25	3.6 ± 0.09
5.	Root length	1.6 ± 0.07	1.94 ± 0.07

Table: 3 Growth Parameters of Green Brinjal 30th Day

S. No.	Parameters	Control	Experiment
1.	Leaf length	5.55 ± 0.27	9.56 ± 0.12
2.	Leaf width	3.95 ± 0.22	7.72 ± 0.34
3.	Stem length	7.85 ± 0.34	13.12 ± 0.24
4.	No. of leaves	4.5 ± 0.25	4.4 ± 0.20
5.	Root length	1.85 ± 0.01	2.08 ± 0.11

Table: 4 Growth Parameters of Green Brinjal 40th Day

S. No.	Days	Control	Experiment
1.	Leaf length	6.05 ± 0.12	11.18 ± 0.56
2.	Leaf width	4.4 ± 0.31	9.14 ± 0.43
3.	Stem length	8.25 ± 0.25	15.26 ± 0.27
4.	No. of leaves	4.5 ± 0.25	4.6 ± 0.27
5.	Root length	2.0 ± 0.07	2.18 ± 0.08

Table: 5 Growth Parameters of Green Brinjal 50th Day

S. No.	Parameters	Control	Experiment
1.	Leaf length	6.4 ± 0.31	12.92 ± 0.42
2.	Leaf width	4.9 ± 0.15	11.04 ± 0.25
3.	Stem length	8.7 ± 0.31	29.88 ± 0.34
4.	No. of leaves	5.5 ± 0.25	8.2 ± 0.34
5.	Root length	2.35 ± 0.10	2.38 ± 0.078
6.	No. of flowers	1 ± 0.1	2.6 ± 0.30

Table: 6: Growth Parameters of Green Brinjal 60th Days

S. No.	Parameters	Control	Experiment
1.	Leaf length	6.8 ± 0.05	15.48 ± 0.28
2.	Leaf width	5.4 ± 0.20	13.26 ± 0.27
3.	Stem length	9.1 ± 0.31	32.08 ± 0.40
4.	No. of leaves	6.5 ± 0.25	8.6 ± 0.41
5.	Root length	2.6 ± 0.03	3.18 ± 0.07
6.	No. of flowers	1.5 ± 0.03	3.6 ± 0.64

Table: 7 Growth Parameters of Green Brinjal 70th Day

S. No.	Parameters	Control	Experiment
1.	Leaf length	7.25 ± 0.07	16.26 ± 0.31
2.	Leaf width	5.8 ± 0.28	13.8 ± 0.27
3.	Stem length	9.45 ± 0.07	34.4 ± 0.40
4.	No. of leaves	7 ± 08	9.4 ± 0.37
5.	Root length	2.85 ± 0.10	4.1 ± 0.12
6.	No. of flowers	2 ± 0.35	4.8 ± 0.96

Table: 8 Yield Parameters Green Brinjal fruits in 100 Days

S. No.	Parameters	Control	Experiment
1.	No. of fruits	1 ± 0.1	5.2 ± 0.64
2.	Fruits length	10.65 ± 0.31	20.4 ± 0.91
3.	Fruits width	6.7 ± 0.14	10.36 ± 0.34
4.	Weight of fruits	0.78 ± 0.21	0.129 ± 0.14

Conclusion

Panchagavya is a natural and sustainable alternative to chemical fertilizers and pesticides. While further research is needed to fully understand its mechanisms and optimize its application, Panchagavya holds significant potential as a valuable resource for organic and sustainable farming practices.

Declaration of Competing Interest: The authors declare that they have no competing interests.

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