

Plant Growth Promotion Using Panchagavya

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ABSTRACT

In the traditional agro practice, people have used organic nutrients panchagavya to promote plant growth. In the present, panchagavya was prepared using a modified methodology incorporating tulsi and neem oil along with traditional panchagavya constituents. Different concentration of the prepared panchagavya was tested using the common vegetable crop *Abelmoschus esculentus* (bhendi). The invigoration of the seed germination was found to depend on the soaking duration of panchagavya and its concentration. Growth hormones and bacteria associated with panchagavya were reported to enhance seed germination and growth.

Keywords: Panchagavya, *Abelmoschus* sp, plant growth promoter and germination ability.

I. INTRODUCTION

The current interest to produce organically grown vegetables ensures environmental quality maintenance and consumers health protection. As an alternative to chemical fertilizer, organic products like panchagavya are developed and used. The use of organic nutrients for plant growth enhances the quality of the product and sustain shelf life period. [1] Indira *et al.*, [2] reports that the preparation and usage of panchagavya had been reported in vedic literature and such vedic organic agriculture re-enliven natural law in agriculture, bringing the farmer, the process of farming and the environment in complete harmony with each other. Panchagavya preparation varies with the people although the ingredients are common. Panchagavya has been reported to contain micronutrients, macronutrients, many vitamins, essential amino acids, growth promoting factors and beneficial microbes. [3,4] In the present study a novel method of panchagavya was

prepared and its efficiency to promote plant growth was tested.

II. MATERIALS AND METHODS

For the present study *Abelmoschus* plant was chosen to find out the efficiency of the panchagavya was developed.

Preparation – materials such as Cow dung, Cow ghee, Cow urine, Cow curd, Cow milk, Banana, Jaggery, Tender ground nut water, Neem oil and Tulsi extract collected for preparation of panchakavya. Fresh cow dung of 1 kg was taken and it was mixed with 100 gm of cow's ghee kept undisturbed for 4 days. After 4 days 600ml of cow's urine and 600 ml of tender coconut water was added and mixed well. After 15 days the following ingredients were added, 400 ml cow's milk, 400ml cow's curd, 200 gm of ripped crushed banana [palayansotan] 100 gm of cane sugar jiggery and 600 ml of water. To this mixture 50 ml of *Ocimum tenuiflorum* [Tulsi] leaf juice and 50 ml of neem oil were added. The contents were mixed well. The entire mixture was prepared in an earthen pot and kept

undisturbed for 20 days to allow fermentation. After 20 days the panchagavya preparations with a good odour become ready.

Physico-chemical analysis - Panchagavya was made and the values are given below: PH- 5.5, Total nitrogen-230 ppm, Total potassium-320 ppm, Total phosphate-325 ppm, Gibberellic acid-3.4 ppm, Indole acetic acid-13.1 ppm and Total bacterial- 86×10^6 CFU/ml

Spray preparation - The total panchagavya preparations are treated as stock. From this stock 1%, 2%, 3%, 4% and 5% concentration were prepared by mixing with sterile double distilled water. The prepared dilutions were used for the experiments. The seeds of the plant, *Abelmoschus esculentus* were soaked in the respective concentrations for 12 hrs and 24 hrs for germination tests. After germination the growth of the plant was measured based on roots and shoot lengths. To find out the influence of panchagavya on meristic traits the different concentrations were sprayed on 30 day. For the germination invigoration tests the percentage of germination was calculated for 25 seeds. For morphometric study 10 plants were used. For the control group the seeds were soaked only in water.

III. RESULTS AND DISCUSSION

Influence of panchagavya on the invigoration of seed germination and meristic changes in plants were evaluated. The seed germination ability of *Abelmoschus esculentus* was analysed by soaking the seed in panchagavya concentrations and water for 12hrs and 24 hrs. The 24 hrs pre treatment of seeds showed good germination ability when compared with 12 hrs pre soaking. The germination ability in the seeds varied with the concentration of the panchagavya (table 1). At a concentration of 4 and 5 percent, the germination and meristic growth of *Abelmoschus esculentus* was high when compared to control. An enhanced seed invigoration in panchagavya pre treated seeds might be due to chemical constituents in the panchagavya. According to Ratnoo and Bhatnagar, [5] Saritha et al., [6] and Srimathi et al., [7] reported microbes and growth promoters in panchagavya promoter's germination ability. In the present study also the presence of certain growth hormones interfere with germination ability.

TABLE 1: Influence of seed fortification treatment with panchagavya on seed invigoration of *Abelmoschus Sp.*

Panchagavya Concentration	Soaking Duration And Germination Percentage		Shoot Length(cm)		Root Length(cm)	
	12 hrs	24 hrs	3rd Day	5th Day	3rd Day	5th Day
1%	81.2	84.3	8.4	8.9	21.1	2.6
2%	81.5	84.2	9.6	10.8	3.3	3.8
3%	84.3	87.6	10.7	13.7	4.2	5.7
4%	89.8	100	14.5	18.6	4.8	6.2
5%	91.4	100	15.4	21.8	5.3	7.8
Control (water)	81.5	85.6	14.3	18.6	4.3	5.4

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REFERENCES

1. S Sarkar, SS. Kundu, and D. Ghorai, "Validation of ancient liquid organics Panchagavya and kunapajala as plant growth promotion *Indian journal of traditional knowledge*, 2014, Vol.13 (2): 398-403.
2. V.Indira. P. Dhasarathan and M. Anandadevi. 2010. Impact of Agnihotra in mushroom cultivation technology. *J.Bio Sci. Res.* 1(4):245-250
3. N Gore, and N Sreenivasa, "Influence of liquid organic manures on growth, nutrients, contents and yield of tomato", *Karnataka J.Agric.sci.*, 2011, Vol. 24 (2): 131-157.

4. M.N. Sreenivasa, M. Nagaraj, Naik and S.N.Bhat, Beejamruth “A source for beneficial bactertia”, *Karnataka J.Agric.sci.* 2010, Vol.17 (3):72-7.
5. RS Ratnoo Bhatnagar, “Neem cake in disease control”, *Indian J. MYcd. Plant pathol*, 1993, 23:186-188.
6. Saritha M. “Influence of selected organic manures on the seed germination and seedling growth of cluster bean”, *Sci. technol. Arts. RCSJ*, 2013, vol.2 (2):16-21.
7. P.Srimathi, N.Mariappan and L. Sundaramoorthy, “Efficacy of panchagavya on seed invigoration of biofuel crops”, *Academic journal*, 2013, Vol.8 (4):2031-2037.

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