



EFFECT OF PANCHAGAVYA ON GERMINATION AND SEEDLING GROWTH OF BALSAM (*IMPATIENS BALSAMINA*)

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Abstract

An investigation was made in the Department of Horticulture, Faculty of Agriculture, Annamalai University to find out the “Effect of panchagavya on germination and seedling growth of balsam”. The experiment was carried out in Factorial Completely Randomized Design (FCRD) with six treatments and three replications. The seeds are soaked in 5 different concentrations (1-5%) of panchagavya along with distilled water soaking in different time duration of 8, 16 and 24 hours. After the required period of soaking the seeds are taken out and transferred to planting media. The media used in this study was soil, sand and organic matter with the ratio of 1:1:1. Among the various concentration of panchagavya used, 2% with 24 hours soaking showed maximum percentage of germination (86%), shoot length (14 cm) and root length (4 cm).

Introduction

Impatiens balsamina, is a rainy season annual plant growing to 20–75 cm tall, with a thick, but soft stem commonly known as balsam, garden balsam, rose balsam, touch-me-not or spotted snapweed and native to India and Myanmar. It prefers partial shade and belongs to the family Balsaminaceae. It covers a wide variety of forms and tones. Balsam requires 60 to 70 days from sowing to produce flowers, so an early start is essential. The flowers bear double petals and come in an array of colours but are partially hidden by large attractive leaves with pronounced veins. Balsams come in white, red, orange, violet and pink. Panchagavya means “mixture of five products (cow dung, cow urine, Milk, ghee and curd) of cow”. Of these, the three direct constituents are cow dung, cow urine and milk and the two derived products are curd and ghee. It has been used in traditional India rituals throughout history. Panchagavya is also used as fertilizer and pesticide in agricultural operations. Panchagavya is an organic product recommended for crop improvement in organic agriculture (Sangeetha and Thevanathan, 2010). It is used as a foliar spray, soil application along with irrigation, as well as seed treatment (Natarajan, 2002). Panchagavya has resulted in positive

effect on growth and productivity of crops as reported by Somasundaram *et al.*, (2007). Therefore, the present study was carried out with an objective to evaluate the effect of different concentration of panchagavya on germination, shoot and root length of balsam seedling.

Materials and method

The experiment entitled “Effect of panchagavya on germination and seedling growth of balsam (*Impatiens balsamina*)” was carried out in the Department of Horticulture, Faculty of Agriculture, Annamalai University. The experiment was laid out in Factorial Completely Randomized Design (FCRD) with six treatments and three replications. The balsam seeds were obtained from the private vendor at Sivapuri village near Annamalainagar during the entire period of study. The seeds are soaked in 5 different concentrations (1-5%) of panchagavya along with control (distilled water soaking) which is soaked in different time duration like 8, 16 and 24 hours. After the required period of soaking the seeds are taken out and transferred to planting media. The media used in this study was red soil, sand and organic matter with the ratio of 1:1:1. Data on percentage of germination, shoot length and root length were recorded in all treatments.

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Treatment Details

Factor 1:

T₁ – Distilled water

T₂ – 1% of panchagavya

T₃ – 2% of panchagavya

T₄ – 3% of panchagavya

T₅ – 4% of panchagavya

T₆ – 5% of panchagavya

Factor 2:

D₁ – 8 hours

D₂ – 16 hours

D₃ – 24 hours

Results and discussion

The statistical analysis of data revealed that effect of different concentration of panchagavya on the germination of balsam were significant (table 1). Among the various treatments of balsam seedling, T₃ - 2% panchagavya with 24 hours soaking was found to be the best with 86% of germination followed by T₃ and T₅ with 16 hours soaking (73%). T₁ with 8 hours soaking (0%) and T₂ with 24 hours soaking (0%) were found to have the least germination percentage. Saritha *et al.* (2013) revealed that panchagavya possess almost all the major nutrients, micronutrients and growth hormones enhances the metabolic activity of plants and supports better seed germination.

The data presented in table 2 revealed that the maximum shoot length of 14 cm was noticed with 2% of panchagavya with 24 hours soaking (T₃) which was followed by T₃ with the value of 11 cm with 8 hours soaking and the least value of 5.7cm was observed with 4% of panchagavya (T₅) with 16 hours soaking. The data

Table 1: Effect of different concentration of panchagavya on the germination of *Impatiens balsamina*

Trt. No.	Concentration of panchagavya	Soaking duration			Mean
		8 hours	16 hours	24 hours	
T ₁	Distilled water	0%	13%	20%	10.78
T ₂	1% of panchagavya	66%	60%	0%	41.78
T ₃	2% of panchagavya	60%	73%	86%	72.33
T ₄	3% of panchagavya	60%	46%	66%	57.11
T ₅	4% of panchagavya	53%	73%	53%	59.00
T ₆	5% of panchagavya	53%	60%	60%	57.56
Factor		S. Ed. (±)			CD@5%
T		0.463			0.938
D		0.327			0.663
T × D		0.801			1.625

Table 2: Effect of different concentration of panchagavya on the shoot length of *Impatiens balsamina*

Trt. No.	Concentration of panchagavya	Soaking duration			Mean
		8 hours	16 hours	24 hours	
T ₁	Distilled water	0cm	6cm	6.3cm	4.22
T ₂	1% of panchagavya	6cm	8cm	0cm	4.87
T ₃	2% of panchagavya	11cm	7cm	14cm	10.47
T ₄	3% of panchagavya	8.5cm	6.5cm	9cm	8.03
T ₅	4% of panchagavya	9cm	5.7cm	7.4cm	7.29
T ₆	5% of panchagavya	9cm	6.4cm	8.2cm	7.90
Factor		S. Ed. (±)			CD@5%
T		0.154			0.311
D		0.109			0.220
T × D		0.266			0.539

Table 3: Effect of different concentration of panchagavya on the root length of *Impatiens balsamina*

Trt. No.	Concentration of panchagavya	Soaking duration			Mean
		8 hours	16 hours	24 hours	
T ₁	Distilled water	0cm	1.2cm	2cm	1.22
T ₂	1% of panchagavya	3cm	2.4cm	0cm	2.04
T ₃	2% of panchagavya	2.5cm	2.3cm	4cm	2.87
T ₄	3% of panchagavya	2cm	1.8cm	2.3cm	1.89
T ₅	4% of panchagavya	3cm	1.7cm	3.2cm	2.57
T ₆	5% of panchagavya	2cm	2cm	1.5cm	1.78
Factor		S. Ed. (±)			CD@5%
T		0.154			0.311
D		0.089			0.180
T × D		0.218			0.442

presented in table 3 revealed that, among the various treatment of balsam seedlings, 2% of panchagavya with 24 hours seed soaking (T₃) was found to be the best with a root length of 4 cm followed by 4% of panchagavya with 24 hours soaking (3.2 cm). The least root length was noticed with T₁ with 8 and 16 seed soaking with the value of 0 cm, 1.2 cm. The increase in shoot length and root length may be due to the presence of plant growth promoting substances produced by bacteria that are present in panchagavya (Naik and Sreenivasa, 2009). The results are in close conformity with the findings of Srimathi *et al.* (2013) in *Jatropha* and *Pungamia*. Similar results were found by Emily (2003) in *Withania somnifera* (L) Dunal.

Microbes such as rhizobium, azotobacters, azospirillum, phosphorus solubilizing bacteria, trichoderma and pseudomonas present in panchagavya act as liquid bio-fertilizer and bio-pesticides. Sometimes shoot length and root length were reduced with increasing concentration levels and duration with organic fortification which might

be due to optimal dose of the organic product which is normally specific to crop (Sumangala and Patil, 2009).

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