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## Influence of organic nutrients on black pepper cuttings (*Piper nigrum* L.)

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#### Abstract

The present investigation entitled “Influence of organic nutrients on black pepper cuttings (*Piper nigrum* L.)” was undertaken at College of Horticulture, DBSKKV, and Dapoli (M.S.) during the year 2020-2021. The experiment was conducted in RBD with ten treatments and three replications. The treatments comprises; T<sub>1</sub>-Vermiwash 10% drenching, T<sub>2</sub>-Vermiwash 15% drenching, T<sub>3</sub>-Vermiwash 20% drenching, T<sub>4</sub>-Cow urine 2.5% drenching, T<sub>5</sub>-Cow urine 5% drenching, T<sub>6</sub>-Cow urine 7.5% drenching, T<sub>7</sub>-Humic acid 0.1% drenching, T<sub>8</sub>-Humic acid 0.2% drenching, T<sub>9</sub>-Humic acid 0.3% drenching, T<sub>10</sub>-Control. In different treatments studied, the treatment T<sub>6</sub> (cow urine 7.5% drenching) recorded maximum length of shoot (87.97cm), number of leaves (13.17) and root length (18.82 cm) appeared as best treatment while, the lowest value observed under control (T<sub>10</sub>).

**Keywords:** Black pepper, sprouting, leaves, root, shoot etc.

#### Introduction

Black pepper is commonly known as *Kali Mirch* in Urdu and Hindi, *Pippali* in Sanskrit, *Milagu* in Tamil and Peppercorn, White pepper, Green pepper, Black pepper and Madagascar pepper in English. Pepper is produced from the berries of the vine (Devasahayam *et al.*, 2006)<sup>[3]</sup>. The oleoresin fraction of black pepper possesses the medicinal properties to remedy against the bacterial and fungicidal infections (Devasahayam *et al.*, 2006)<sup>[3]</sup>. Black Pepper was also used for serving other purposes besides its medicinal value from ancient India. Pepper is esteemed spices over the rest spices due to its pungency and flavour, which is governed by the alkaloid piperine and the volatile oil (Ravindran *et al.*, 2000)<sup>[11]</sup>. The oil is extracted by using the steam distillation of the dried and crushed black pepper corns and is used for anti-septic, analgesic, digestive, anti-catharrhal, diuretic, stimulant, bactericidal, expectorant and a tonic. Black pepper is used as a mental stimulant, helps to increase stamina and aid alertness. It can be used to help increase concentration and prevent memory loss.

In India it is used as flavouring ingredient in kitchen for the preparing several delicious dishes and also used in some notable food products including the non-alcoholic beverages, candies, baked foods, meat and meat products, cheese, condiments and relishes, etc. Sabinene seemed to be the utmost vital suppliers among the volatile compounds to the characteristic odour of black pepper oil. (Pinno *et al.*, 1990)<sup>[10]</sup>.

Vermiwash is a transparent pale yellow liquid bio-fertilizer which is a mixture of excretory components and mucous secretion of earthworms and organic micronutrients used to promoted as a potent fertilizer (Yadav *et al.*, 2005)<sup>[13]</sup>. Cow urine is a good source of nitrogen, phosphorus, potassium, calcium, magnesium, chlorite and sulphate. It contain 95% water, urea 2.5%, other 2.5% (mineral salts, hormones and enzymes) (Bhadauria, 2002)<sup>[1]</sup> beneficial to the plant and it is a cheap input easy to acquire by the rural producer.

The development of black pepper cuttings is very sluggish at nursery stage; therefore, they do not reach appropriate size at the time of establishing and marketing, this may also lead to hefty mortality after planting. The propagation success and growth of such plants are comparatively less. Therefore to improve success for rapid growth the application of growth promoter need to be tried. Hence, the present study is commencing to derive rapid growth of cuttings at nursery stage so that they will reach appropriate size of cutting plant at the time of planting in the field as well as at the time of marketing

#### Material and Methods

The field experiment was carried out at the Nursery Plot No. 4, Department of Plantation, Spices, Medicinal and Aromatic Crops, College of Horticulture, Dapoli, Dr. Balasaheb Sawant

Konkan Krishi Vidyapeeth, Dapoli, Dist. Ratnagiri during the year 2020-2021. The experiment was conducted in Randomized Block Design (RBD) with ten treatments and three replications. Five black pepper cuttings in each treatment per replication were selected randomly to record observations. In each treatment, 50 cuttings were planted in every replication. Growth parameters of black pepper cutting viz., sprouting%, number of leaves, dry weight of root (g), and dry weight of shoots (g) were recorded at appropriate stages during investigation period. The data was statistically analysed as method suggested by Panse and Sukhatme (1995) [8].

## Results and Discussion

The data presented in Table 1 showed significant difference among the treatments. Highest sprouting (90.00%) was observed in treatment T<sub>6</sub> - Cow urine 7.5% and was found at par with treatments T<sub>3</sub> - Vermiwash 20% (88.00%). While the lowest sprouting percentage was recorded in treatment T<sub>10</sub> i.e. Control (70.00%). In present investigation the highest sprouting percentage of black pepper cutting recorded with cow urine 7.5% followed in vermiwash (20% and 15%) while lowest in control. In sprouting of the cuttings, root volume plays major role. Cow urine and vermiwash contains auxins which are directly involved in the development of the plant root system. These auxins are found responsible for increasing the cell activity and root formation (Jackson, 1997). This might have led to maximum% of sprouting was obtained in treatments of cow urine 7.5% and vermiwash (20%). Smitha and Umsha (2012) [14] reported the maximum sprouting percentage with cow urine diluted in water (1:10) in stevia cuttings). Pawar *et al.* (2019) [9] obtained 94.00% and 93.66% sprouting when bush pepper cuttings treated with vermiwash 15% drenching and cow urine 15% drenching, respectively and are in agreement with the present findings.

In this investigation significantly the maximum number of leaves (13.17) were recorded in treatment T<sub>6</sub> (Cow urine 7.5%) which was superior over rest of the treatments including control. While, the minimum number of leaves (8.13) observed in treatment T<sub>10</sub> (control). Cow urine increases soil fertility and makes nutrients available to plants which might be the reason for increase in number of leaves due to more food availability and increased chlorophyll content (Chandramouli, 2001) [12]. Similar results were also obtained by Pawar *et al.* (2020) [9] in bush pepper. Present results are accordance with findings reported by Shinde and Malshe (2015) [12] and Pawar *et al.* (2020) [9] in bush pepper wherein they recorded maximum girth (3.70 mm) with 15% cow urine drenching.

Cow urine application increases the root weight of cuttings by increasing the carbohydrate and protein content and this indirectly might be responsible for increase in dry root weight of black pepper cuttings. (Chandramouli, 2001) [12]. Further, increased of root length, volume and number both in cow urine 7.5% and vermiwash 20% drenching might have increased the dry root weight of black pepper cuttings. Present results are in line with the findings reported by Gawas *et al.* (2019) [4] in black pepper.

At 180 DAP, significantly the maximum dry shoot weight (35.60 g) of black pepper cuttings was observed in treatment T<sub>6</sub> (Cow urine 7.5%) and it was superior over rest of the treatments. Minimum dry shoot weight (15.00 g) was noticed in treatment T<sub>10</sub> (Control). Since cow urine application increased the carbohydrate and protein reserve in plant body, it might have resulted in increased shoot weight and indirectly lead to increase in dry shoot weight (Chandramouli, 2001) [12]. Further, the higher dry shoot weight in cow urine 7.5% drenching due to increase in shoot length, number of leaves, leaf area and girth of black pepper cuttings. The similar results were also reported by Gavit (2018) [5] in khirmi.

**Table 1:** Effect of organic nutrient on growth parameter of black pepper cuttings

Treatments	Growth parameter			
	Sprouting%	Number of leaves	Root dry weight	Shoot dry weight
T <sub>1</sub> : Vermiwash (10%)	74.00 (59.35)	9.93	2.82	28.40
T <sub>2</sub> : Vermiwash (15%)	84.00 (66.45)	10.27	3.55	26.60
T <sub>3</sub> : Vermiwash (20%)	88.00 (69.91)	10.73	3.95	33.20
T <sub>4</sub> : Cow urine (2.5%)	72.00 (58.06)	9.20	3.93	23.20
T <sub>5</sub> : Cow urine (5%)	84.00 (66.45)	10.20	3.84	19.40
T <sub>6</sub> : Cow urine (7.5%)	90.00 (71.57)	13.17	3.99	35.60
T <sub>7</sub> : Humic acid (0.1%)	74.00 (59.35)	9.13	3.38	22.00
T <sub>8</sub> : Humic acid (0.2%)	72.00 (58.06)	9.27	3.04	22.40
T <sub>9</sub> : Humic acid (0.3%)	74.00 (59.34)	10.33	2.84	30.00
T <sub>10</sub> :Control	70.00 (56.80)	8.13	1.83	15.00
Mean	78.20	10.04	3.32	25.58
S.Em ±	1.20	0.40	0.013	0.45
CD at 5%	3.58	1.19	0.039	1.36

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