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# Effect of application of organic nutrients on survival and sprouting of black pepper cuttings (*Piper nigrum* L.)

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**Abstract**
The investigation entitled "Effect of Application of Organic Nutrients on Survival and Growth of Black Pepper Cuttings (*Piper nigrum* L.)" was undertaken at College of Horticulture, DBSKKV, Dapoli (M.S.) during the year 2020-2021. The experiment was conducted in Randomized Block Design (RBD) with ten treatments and three replications. The treatments comprises; $T_1$-Vermiwash 10% drenching, $T_2$-Vermiwash 15% drenching, $T_3$-Vermiwash 20% drenching, $T_4$-Cow urine 2.5% drenching, $T_5$-Cow urine 5% drenching, $T_6$-Cow urine 7.5% drenching, $T_7$-Humic acid 0.1 drenching, $T_8$ - Humic acid 0.2% drenching, $T_9$-Humic acid 0.3%.drenching, $T_{10}$-Control. The different treatments studied in which the treatment $T_6$ (cow urine 7.5% drenching) recorded the highest survival per cent (88%), required minimum number of days for initial sprouting (19.33 days) improved success, survival of black pepper cuttings in comparison to control and other treatments.

**Keywords:** Black pepper, drenching, organic nutrients, cow urine, survival and growth

## Introduction
Black Pepper (*Piper nigrum* L.) belongs to family Piperaceae also known as 'Black gold' and 'King of spices' is the most important and widely used spice in the world occupying a position that is utmost and exclusive. Black pepper is originated in the tropical evergreen forests of the Western Ghats and Malabar Coast of India was the centre of the pepper trade since ancient time.

Presently, the leading countries in the production of the black pepper are Vietnam, Indonesia, India and Brazil (Patil *et al.*, 2016) [11]. The area and production of black pepper is 1, 39,487 and 66,000 tones in India (Anon., 2020) [2]. Annual export of black pepper from India estimated around 16,840 MT and earning Rs. 82,078.48 lakhs foreign exchange. In India, Kerala and Karnataka states are the largest producer and Kerala is the inherent place of black pepper accounts about over 50 per cent of India's total production. USA, UK, Germany, Vietnam, Netherlands, Japan and Sweden are the main buyers of black pepper from the India (Abraham, 2018). Black pepper grows efficaciously between $20^0$ North and $20^0$ South of equator and elevation up to 1500 m above MSL in humid tropics. Well distributed annual rainfall of 125-200 cm is considered superlative for black pepper. Rainfall after stress induces bounteous flowering. The crop endures temperature Between 10 to 40 $^0$C. The superlative temperature is 23 to 32 $^0$C. Optimal soil temperature for ideal root growth is 26 to 28 $^0$C.

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) [3] beneficial to the plant and it is a cheap input easy to acquire by the rural producer. It recognized beneficial effect on germination, growth components *viz*., plant height, number of leaves, leaf area and yield. This has been attributed to the fact that cow urine contains physiologically active substances *viz*., growth regulators, nutrients (Joseph and Nair, 1989) [9].

## Material and Methods
The field experiment was carried out at the 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. Cuttings were collected from 2 to 3 year old healthy black pepper plantation. The observations on the success and survival cutting was recorded up to 30 days interval after planting of cuttings in experiment of each treatment.

## Results and Discussion

The data pertaining to the effect of organic nutrient on survival percent (%) of black pepper cuttings have been presented in Table 1 that there was significant difference among the treatments at 180 DAP. Highest survival (88.00%) was observed in the treatment $T_6$ - Cow urine @ 7.5% which was at par with treatments $T_3$ - Vermiwash 20% (86.00%), $T_2$ - Vermiwash 15% (82.67%) and $T_5$ - Cow urine 5% (82.00%), while the treatment $T_{10}$ recorded the lowest survival was (67.33%). The cuttings treated with cow urine and vermiwash resulted in development of effective root system and increased in number and root length due to increasing mitotic index. (Jandaik *et al*., 2015) [8] This might be due to influenced the uptake of nutrients and water and thereby enhanced more survival per cent of black pepper cutting. Present results were analogous to the findings recorded by Gawas *et al.* (2019) [5] in black pepper, Pawar *et al.* (2020) [12] in bush pepper and Shreesty *et al.* (2019) [13] in karonda.

The data pertaining to sprouting percentage of black pepper cuttings influenced by different organic nutrient treatments, from the Table 2 it was seen that, minimum number of days required for initiation of sprouting (19.33 days) was observed in treatment $T_6$ (Cow urine 7.5%) which was found at par with treatments $T_1$ - Vermiwash 10% (21.00 day), $T_5$ - Cow urine 5% (21.60 days), $T_2$ - Vermiwash 15% (22.27 days), $T_4$ - Cow urine 2.5% (22.60 days) and $T_3$-Vermiwash 20% (22.60 days).While, the maximum number of days required for initial sprouting (26.00 days) was recorded in treatment $T_{10}$.

The early sprouting recorded in Cow urine and Vermiwash drenching. Earliness in sprouting might be due to utilization of stored carbohydrates present in the cuttings, nitrogen and other factors with the aid of growth regulators (Chandramouli, 2001) application of cow urine besides improving soil textures it also working as plant harmone. Cow urine and vermiwash contain auxins, auxins are involved in the chelation of iron for the plant, improving growth health and nutrient intensity of the plant, especially the development of the root system of the plant (Jackson, 1973) [6]. The weather condition during investigation period was also congenial for increasing the cell activity and enhanced the cell division for formation of roots. Hence the number of days required for initiation of sprouting was minimum in treatment cow urine and vermiwash. This results are in confirmatory with findings reported by Pawar *et al.*, (2020) [12] in bush pepper with Vermiwash 15% drenching (16.43 days) and Smitha and Umesha (2012) in Stevia.

**Table 1:** Effect of organic nutrient on survival (%) of black pepper cuttings at 180 DAP

| Treatments | Survival (%) |
|---|---|
| $T_1$: Vermiwash (10%) | 71.33 (57.64*) |
| $T_2$: Vermiwash (15%) | 82.67 (65.45*) |
| $T_3$: Vermiwash (20%) | 86.00 (68.06*) |
| $T_4$: Cow urine (2.5%) | 70.67 (57.28*) |
| $T_5$: Cow urine (5%) | 82.00 (64.92*) |
| $T_6$: Cow urine (7.5%) | 88.00 (69.77*) |
| $T_7$: Humic acid (0.1%) | 72.67 (58.50*) |
| $T_8$: Humic acid (0.2%) | 70.00 (56.80*) |
| $T_9$: Humic acid (0.3%) | 71.33 (57.63*) |
| $T_{10}$:Control | 67.33 (55.20*) |
| Mean | 76.20 |
| S.Em ± | 2.05 |
| CD at 5% | 6.09 |

(Figures in parenthesis indicates arcsine transformed value)

**Table 2:** Effect of organic nutrient on days for initiation of sprouting of black pepper cuttings

| Treatments | Days for initiation of sprouting |
|---|---|
| $T_1$: Vermiwash (10%) | 21.00 |
| $T_2$: Vermiwash (15%) | 22.27 |
| $T_3$: Vermiwash (20%) | 22.60 |
| $T_4$: Cow urine (2.5%) | 22.60 |
| $T_5$: Cow urine (5%) | 21.60 |
| $T_6$: Cow urine (7.5%) | 19.33 |
| $T_7$: Humic acid (0.1%) | 25.73 |
| $T_8$: Humic acid (0.2%) | 23.97 |
| $T_9$: Humic acid (0.3%) | 23.53 |
| $T_{10}$:Control | 26.00 |
| Mean | 22.86 |
| S.E.m ± | 1.15 |
| CD at 5% | 3.43 |

## References


1. Abraham A. The Trend in Export, Import and Production performance of Black pepper in India. International J Pure and Applied Mathematics 2018;118(18):4795-4802.
2. Anonymous. State Agri/ Hort. Departments/DASD Kozhikkode, Cardamom: Estimate by Spices Board, Provisional 2020.
3. Bhadauria H. Cow Urine- A Magical Therapy. Vishwa Ayurveda Parishad, Int. J Cow Sci 2002;1:32-36.
4. Chandramouli H. Influence of growth regulators on the rooting of different types of cuttings in *Bursera penicilliata* (DC) Engl. M.Sc. (Agri.) Thesis submitted to University of Agricultural Sciences, Bangalore, (Unpublished) 2001.
5. Gawas IG, Khandekar RG, Burondkar MM, and Salavi VG. Effect of different concentration of vermiwash on rooting, survival and growth of black pepper (*Piper nigrum* L.). M.Sc. (Horti) thesis submitted to Dr. Balasaheb Sawant Konkan Krishi Vidyapeeth Dapoli, Maharashtra 2019.
6. Jackson ML. Soil Chemical Analysis. Prentice Hall of India Pvt. Ltd., New Delhi 1973, 134-182.
7. Jackson RW. Dynamic growing with humic acids for master gardeners. Soil Renu. California 1995.

8. Jandaik S, Thakur P, Kumar V. Efficiancy of cow urine as plant growth enhancer and antifungal agent. Adv.in Agriculture 2015;(1):1-7.
9. Joseph K, Nair R. Effect of seed hardening on germination and seedling vigour in paddy. Seed Research 1989;17(2):188-190.
10. Panse VG, Sukhatme PV. Statistical Methods for Agricultural Workers, published by Indian Council of Agricultural Research, New Delhi 1995.
11. Patil MS, Karale AR, Badgujar CD, Adiga JD. Essence of Horticulture. New India Publishing Agency, New Delhi 2016, 558-569.
12. Pawar JT, Khandekar RG, Mali PC, Mane AV. Effect of different plant growth promoters on sprouting and survival in bush pepper (*Piper nigrum* L.) J pharmacognosy and phytochemistry 2020;9(6):1886-1888.
13. Shreesty P, Sharma TR, Nagar OP. Effect of cow urine and plant growth promoting rhizobacteria (PGPR) on seed germination, growth and survival of Karonda (*Carissa karandas* L.) seedling. International J Current Microbiology and Applied Sciences 2019;8(11):1967-1978.
14. Smitha GR, Umesha K. Vegetative propagation of stevia (*Stevia rebaudiana* (Bertoni) Hemsl) through stem cuttings. J Trop. Agri 2020;50(1-2):72-75.