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Effect of different concentrations of vermiwaash on survival and sprouting of black pepper cuttings (*piper nigrum* l.)

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ABSTRACT
The present investigation entitled "Effect of different concentrations of vermiwash on survival and sprouting of black pepper cuttings (Piper nigrum L.)" was conducted at the Department of Horticulture, College of Agriculture Dapoli, and Dist. Ratnagiri during the year 2018-2019. The experiment was conducted in Randomized Block Design with six treatments and four replications. The treatments were T_1-Vermiwash 10 % drenching, T_2-Vermiwash 20 % drenching, T_3-Vermiwash 30 % drenching, T_4-Vermiwash 40 % drenching, T_5-Vermiwash 50 % drenching and T_6-Control, number of cuttings per treatment were fifty. With the following objectives 1) To study the effect of different concentrations of vermiwash on the survival of black pepper vine cuttings. 2) To study the effect of different concentrations of vermiwash on the root growth of black pepper vine cuttings. Five Black pepper cuttings in each treatment per replication were selected randomly to record observations. Drenching of vermiwash (50 ml) was given to per cutting at monthly basis and survival percentage was observed at the end of experiment and sprouting percentage was observed at starting of experiment during sprouting phase of cuttings. It is observed that sprouting was significantly influenced by vermiwash drenching as compare to control. Early sprouting i.e. less days required for sprouting (18.90) were observed in treatment T_3 (i.e. 30% vermiwash drenching) and treatment T_6 (T_6- control) required more days (25.10) for sprouting. T_4 required less days (38.20)for peak sprouting and treatment T_6 required more days (44.85) for peak sprouting and T_4 required less days (49.20) for last sprouting and while T_6 required more days (58.05) for last sprouting. The vermiwash drenching at various concentrations improves the survival of black pepper cuttings in comparison to control i.e. no vermiwash drenching highest survival (88.50%)were observed in T_4 and lowest survival (60.50%)were observed in treatment T_6.
***Keywords**: Vermiwash, Cuttings, Drenching.*

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INTRODUCTION

Black Pepper is one of the oldest spices in the world. Botanically it is *Piper nigrum* L. which is belongs to family piperaceae it is originated from Western Ghats of India. Black pepper is commonly known as Kalimirch in Hindi, Karimenasu in Kannada, Syahmirch in Urdu, Kalomirch in Gujrati, Marich in Sanskrit, and Kali miri or Golmirh in Marathi [3-5].

Black pepper was used extensively in various remedies in the traditional treatment methods like Ayurveda, Siddha and Unani in India. Besides medicinal usages, black Pepper is valued for its pungency and flavour, which is attributed by the alkaloid piperine and the volatile oil. [9, 10]. The essential oil present in black pepper was used extensively in ancient times and is utilized in different ways in modern India, as well. Black pepper is used as flavour ingredient in many major food products in India. Black pepper is cultivated to a large extent in Kerala, Karnataka and Tamil Nadu where as in Maharashtra cultivated on small scale.

The growth and rooting of black pepper cuttings is very slow at nursery stage, hence, they do not attain appropriate size and good root growth at the planting and selling time and weak root growth leads to heavy mortality after planting. Hence, the present study is undertaken to achieve rapid growth of cuttings by drenching vermiwash liquid at nursery stage so that they will attain appropriate size i.e. height at the time of planting in the field as well as at the selling time [6-10].

Therefore following study was undertaken with following objectives.

1) To study the effect of different concentrations of vermiwash on the survival of black pepper vine cuttings.
2) To study the effect of different concentrations of vermiwash on the root growth of black pepper vine cuttings (i.e. to prepare sellable size rooted cuttings in planting season).

MATERIAL AND METHODS

An investigation was carried out to study the "Effect of different concentrations of vermiwash on survival, and sprouting of black pepper cuttings (*Piper nigrum* L.)" at the Department of Horticulture, College of Agriculture Dapoli, and Dist. Ratnagiri during the period 2018-2019. The experiment was conducted at the Nursery plot NO. 4. in Department of Horticulture, College of Agriculture, Dapoli, Dr. Balasaheb Sawant Konkan Krishi Vidyapeeth, Dapoli. With Randomized Block Design (RBD) with four replications and six treatments and number of cuttings per treatment were Fifty. Size of a polybag 4"×8" and growing media used was as soil: compost (3:1). Cuttings were pretreated with bavistin (2g/1lit). And the treatments were T_1: Vermiwash 10 % drenching, T_2: Vermiwash 20 % drenching, T_3: Vermiwash 30 % drenching, T_4: Vermiwash 40 % drenching, T_5: Vermiwash 50 % drenching, T_6: Control (no drenching). Five Black pepper cuttings in each treatment per replication were selected randomly to record observations. Drenching of vermiwash (50 ml) was given to per cutting at monthly basis. And survival percentage was observed at the end of experiment and sprouting percentage was observed at starting of experiment during sprouting phase of cuttings. Sprouting percentage were counted by the formula

$$\text{Sprouting percentage} = \frac{\text{Sprouted cuttings}}{\text{Total cuttings}} \times 100$$

RESULTS AND DISCUSSION

The data regarding the survival percentage and sprouting of black pepper cuttings is given in table no.1

Table-1: Effect of vermiwash drenching on survival (%) and sprouting of black pepper cuttings.
(Figures in the parentheses are arcsine transformed values)

Treatments	Survival (%)	Days required for firs (initial) sprouting	Days required for peak sprouting	Days required for last sprouting
T_1 - VW 10 % DR	71.00 (57.43)	23.10	43.45	56.75
T_2 -VW % 20 DR	74.50 (59.68)	22.90	43.30	52.60
T_3 - VW % 30 DR	78.50 (62.39)	**18.90**	43.05	52.20
T_4 - VW % 40 DR	**88.50 (70.22)**	21.35	**38.20**	**49.20**
T_5 - VW % 50 DR	81.50 (64.55)	22.20	43.20	51.75
T_6 – Control	60.50 (51.06)	25.10	44.85	58.05
Mean	**75.75**	22.26	42.68	53..43
S. Em ±	**0.99**	1.20	1.00	1.34
CD at 5 %	**2.98**	3.61	3.00	4.04

Survival of black pepper cuttings

It is seen from table no-1 that at the end of experiment highest (88.50 %)survival was in T_4 (i.e. 40 % vermiwash drenching) which was significantly superior over rest of the treatments. And the lowest survival (60.50 %) was observed in treatment T_6 (i.e. control)

Days required for first (initial) sprouting

It is seen from table-1 that T_3 (i.e. 30 % vermiwash drenching) required less days for sprouting (18.90) highest days (25.10) required for first sprouting was observed in T_6 (control)

Days require for peak sprouting

It is seen from table-1 that T_4 (i.e. 40 % vermiwash drenching) required less no. Of days (38.20) for peak sprouting i.e. obtained early sprouting as compare to other treatments, has seen in T_4 and T_6 (control) required highest days (44.85) for peak sprouting.

Days require for last sprouting

It was seen from table-1 that T_4 (i.e. 40 % vermiwash drenching) required less no. of days (49.20) for last sprouting and maximum days (58.05) required for last sprouting in T_6 (i.e. control)

Vermiwash enhance the seedling growth [2]. The results obtained in the present study have corroborated the results of [11] on marigold and those of [7] and [1] on Okra. And the reason behind it could be attributed to the stimulation of the production of auxin-like substances [8, 12].

CONCLUSION

Thus, from the present investigation, it could be concluded that drenching of vermiwash at monthly interval from planting of cuttings showed good results on survival, and sprouting of black pepper cuttings. But vermiwash T_4 (40 % vermiwash drenching) showed the best performance in regards to all growth parameters on sprouting of black pepper cuttings.

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