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Effect of chemicals and biomix on root growth and survivals of cuttings in dragon fruit (*Hylocereus undatus*)

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Abstract
The present investigation entitled "effect of chemicals and biomix on root growth and survival of cutting in dragon fruit (*Hylocereus undatus*)" was carried out at Department of Horticulture College of Agriculture, Badnapur during the year 2020- 2021. The experiment was laid out in randomized block design with ten treatments and replicated thrice. The details of treatment are T_1 - IBA @ 5000 ppm, T_2 - IBA @ 6000 ppm, T_3 - IBA @ 7000 ppm, T_4- PHB @ 500 ppm, T_5- PHB @ 750 ppm, T_6- PHB @ 1000 ppm, T_7 - Biomix @ 0.5%, T_8 - Biomix @ 1.0%, T_9 - Biomix @ 1.5%, T_{10}- Control (No Treatment). In present experimentation, IBA @ 7000 ppm recorded maximum number of primary roots (10.47), maximum average root length (12.50 cm), maximum volume of root (1.98 ml), maximum survival percentage (95.00%), minimum mortality percentage (5.00%) was noticed in treatment T_3 (IBA 7000 ppm) and the minimum value for all these parameters was observed in control (T_{10}), except mortality percentage.

Keywords: Dragon fruit, IBA, PHB, biomix, root growth, survival

Introduction
Dragon fruit is member of the family Cactaceae and perennial, climbing cactus with triangular green stem. It is commonly called Pitaya, Strawberry pear, Night-blooming cereus, Queen of night, Honorable queen, Cereus triangularis, Kamlam and Jesus in the cradle and Belle of the night. The average composition of Drogon fruit is water (89.4 gm), protein (0.5 gm), fat (0.1 gm), crude fiber (0.3 gm), ash (0.5 gm), calcium (6 mg), phosphorus (19 mg), iron (0.4mg), niacin (0.2 mg), Ascorbic acid (25 mg), Brix value (11-19), P^H value (4.7-5.1) Gunasena *et al*., (2006) [1]. It is usually propagated by seed or cuttings. Seed propagation method is very simple, but seeds are not true to type due to cross pollination and also seeds are to be stored for about 28 days without losing viability. Whereas, vegetative propagation is the easiest and cheapest method of propagating dragon fruit particularly by cutting. Plant established from cutting start flowering after one to two years of planting. Cuttings can be obtained throughout the year. Therefor large number of the plantlets with healthy shoots and root system can be produced to meet the demand of increasing commercial cultivation through vegetative propagation method. Dragon fruit has shallow root system hence in water logging soil root damage percentage is more in early growth stages. The reports on an investigation on the propagation of dragon fruit from cuttings and the use of growth regulators for better root growth success and survival are scanty. Therefore, the study was undertaken to propagate Dragon fruit using different chemicals, biomix, for rapid multiplication.

Materials and method
The experiment was carried out at Department of Horticulture, College of Agriculture, Badnapur during the year 2020- 2021. The experiment was laid out in randomized block design with ten treatments replicated thrice. The details of treatment are T_1 - IBA @ 5000 ppm, T_2 - IBA @ 6000 ppm, T_3 - IBA @ 7000 ppm, T_4- PHB @ 500 ppm, T_5- PHB @ 750 ppm, T_6- PHB @ 1000 ppm, T_7 - Biomix @ 0.5%, T_8 - Biomix @ 1.0%, T_9 - Biomix @ 1.5%, T_{10}- Control (No Treatment). Planting of Dragon fruit cuttings in polythene bags of size (4" × 6"). The polythene bags were punctured to improve the drainage and filled with a garden mixture prepared by mixing one part of the soil, one part of sand, one part of well-rotted FYM (1:1:1 proportion of soil, sand and FYM). The cuttings of Dragon fruit (*Hylocereus undatus*) used for this research were selected from 3 years old mother plant.

Cutting will be selected from one year old shoot with 10 to 15 cm length and 4-5 nodes. Treatment wise solutions of IBA, PHB and Biomix were prepared. The required quantities of chemicals were weighed on the chemical balance. The weighed quantity of chemical powder was dissolved in 5ml of ethyl alcohol (50%) then the required quantity of distilled water was added to make the solutions of desired concentrations. The application of these treatments was done. Observations were recorded for number of primary roots, average root length, volume of root, rooting percentage, survival percentage and minimum mortality percentage. The data was analyzed statistically as per method suggested by Panse and Sukhatme (1985) [3].

Results and discussion

Effect of chemicals and biomix on number of primary roots

Maximum number of primary roots (10.47) was reported in treatment T_3 (IBA 7000 ppm) which was at par with treatment T_2 (9.53). The next best treatments were followed by T_1, T_6, T_9, T_5 and T_4. However, minimum number of primary roots (5.60) was recorded in treatment control. Application of Auxins affected the regeneration of roots on cuttings. Auxin, in general, promotes rooting of stem cuttings. The effectiveness however, varies with the nature and concentration of Auxin. The result obtained was in conformity with the Upadhyay and Badyal (2007) [6] in pomegranate.

Effect of chemicals and biomix on root length

Maximum average root length (12.50 cm) was reported in treatment T_3 (IBA 7000 ppm) which was at par with treatment T_2 (11.67cm). The next best treatments were T_6 and T_9. The treatment T_1, T_5, T_8, and T_4 showed intermediate effect. While, minimum average root length (1.63 cm) was reported in treatment control. Auxins are known to induce stimulus for regeneration of root by promotion of hydrolysis, mobilization in the region of root formation. Similar findings were reported by Siddiqui *et al.* 2018 [5] in dragon fruit.

Table 1: Effect of chemicals and biomix on Number of primary roots, root length, root volume, rooting percentage, survival percentage, mortality percentage in dragon fruit (*Hylocereus undatus*)

Tr. No.	Treatment details	Number of primary roots	Root length (cm)	Root volume (ml)	Survival percentage (%)	Mortality percentage (%)
T_1	IBA 5000 ppm	8.00	6.83	1.71	83.33	16.67
T_2	IBA 6000 ppm	9.53	11.67	1.92	92.67	7.33
T_3	IBA 7000 ppm	10.47	12.50	1.98	95.00	5.00
T_4	PHB 500 ppm	7.13	6.01	1.65	82.67	17.33
T_5	PHB 750 ppm	7.53	6.71	1.73	83.33	16.67
T_6	PHB 1000 ppm	8.00	8.17	1.73	84.67	15.33
T_7	Biomix 0.5%	6.00	5.23	1.44	73.33	26.67
T_8	Biomix 1.0%	6.20	6.05	1.58	78.33	21.67
T_9	Biomix 1.5%	7.63	7.00	1.68	83.33	16.67
T_{10}	Control	5.60	1.63	1.35	71.67	28.33
S.Em ±		0.46	0.39	0.08	3.42	3.42
CD @ 5%		1.38	1.17	0.23	10.25	10.25

Effect of chemicals and biomix on root volume (ml)

Maximum volume of root (1.98 ml) was reported in treatment T_3 (IBA 7000 ppm) which was at par with treatment T_2 (1.92 ml). It was followed by treatment T_6, T_5, T_1, T_9, T_4 and T_8which showed intermediate effect. However, minimum volume of root (1.35 ml) was recorded in treatment control. This might be due to the greater portion influenced by auxins, which helped in root growth resulting in higher root volume. Similar results are reported by Siddiqui *et al.* (2018) [5] in dragon fruit.

Effect of chemicals and biomix on survival percentage (%)

Maximum survival percentage (95.00%) was reported in treatment T_3 (IBA 7000 ppm) which was followed by the treatment T_2 (92.67%) and were at par with each other. The next best treatment T_6, T_1, T_5, T_9, T_4 and T_8 which was at par with each other. While, minimum survival percentage (71.67%) was recorded in treatment T_{10} (control). The more number of sprouted cuttings might be due to superiority of treated cuttings regarding the survival can be attributed to better start and root growth. The better start might have facilitated absorption of nutrients and moisture from soil and better growth developed capacity to withstand for a longer period (Ram *et al.*, 2005) [4]. Similar findings were reported by Siddiqui *et al.* 2018 [5] in dragon fruit.

Effect of chemicals and biomix on mortality percentage (%)

The data showed that, minimum mortality percentage (5.00%) was reported in treatment T_3 (IBA 7000 ppm) which was at par with treatment T_2 (7.33%). The next best treatments were T_1, T_6, T_5, T_4, T_9 and T_8 which was at par with each other. While, maximum mortality percentage (28.33%) was recorded in treatment T_{10} *i.e.* control. IBA at higher concentration possesses more potential in development of roots, sprouting and decreases the mortality percentage compared to control. The results are in accordance with the findings of Manan *et al.*, (2002) [2] in guava.

Conclusion

In present experimentation, maximum number of primary roots (10.47), average root length (12.50 cm), volume of root (1.98 ml), survival percentage (95.00%), minimum mortality percentage (5.00%) was noticed in treatment T_3 (IBA 7000 ppm). While minimum number of primary roots (5.60), average root length (1.63 cm), volume of root (1.35 ml), survival percentage (71.67%), maximum mortality percentage (28.33%) was recorded in treatment T_{10} (control).

From the experiment, it may be concluded that the application of IBA @ 7000 ppm by quick dip method was found superior in root growth and survival of dragon fruit. It

was closely at par with IBA @ 6000 ppm. The treatment T_{10} was found inferior among all treatment.

References

1. Gunasena HPM, Pushpakumara DKNG, Kariyawasam M. Dragon fruit Hylocereus undatus (Haw.) Britton and rose: field manual for extension workers. Srilanka council for agricultural policy, Wijerama Mawatha, Colombo 7, Shrilanka; c2006.
2. Manan A, Khan MA, Ahmad W, Satar A. Clonal Propagation of Guava (*Psidium guajava* L.) International Journal of Agriculture & Biology. Department of Horticulture, University of Agriculture, Faisalabad–38040, Pakistan. 2002;4(1):143-144.
3. Panse VG, Sukhatme PV. Statistical method of Agricultural workers, ICAR Publication, New Delhi; c1985.
4. Ram RB, Kumar P, Kumar A. Effect of IBA and PHB on regeneration of pomegranate (*Punica granatum* L.) through stem cuttings. Journal New Agriculturist. 2005;16(1/2):113-122.
5. Siddiqui A, Thippesha D, Shivakumar BS, Nagarajappa A, Ganapathi M. Effect of growth regulators on rooting and shooting of stem cutting in dragon fruit *Hylocereus undatus* (Haworth) Britton & rose. Journal of Pharmacognosy and Phytochemistry. 2018;7(5):1595-1598.
6. Upadhyay SD, Badyal J. Effect of growth regulators on rooting of Pomegranate (*Punica granatum* L.) cutting. Haryana J Hort. Sci. 2007;36(1-2):58-59.