SHORT COMMUNICATION Agricultural Science Digest, Volume 45 Issue 3: 555-558 (June 2025)

Clonal Propagation of *Vernonia elaeagnifolia*

C. Kanimozhi[1], R. Angelin Silviya[2], B. Gopu[3]

10.18805/ag.D-5707

ABSTRACT

As the inclusion of plants in architecture is increasing in the recent years, the need of finding the best propagation techniques for the plants that adds aesthetic value is also increasing. This study focusses on identifying the best diameter of softwood cutting for promoting the propagation of Vernonia which is called as the 'Curtain Creeper.' The present investigation was carried out at SRM Urban Farm Centre, SRM Institute of Science and Technology during the period of 2021-2022. The softwood cuttings of Vernonia with three different diameters as 1 to 1.5 cm, 2 to 2.5 cm and 3 to 3.5 cm were taken and propagated under controlled condition by adopting completely randomized design (CRD). In each treatment, ten observations were recorded for different plant growth parameters. Among the different softwood cuttings of Vernonia, the cuttings with 3 to 3.5 cm (T_3) diameter recorded highest mean values of stem thickness, stem length, number of roots, root length and leaf branches.

Key words: Propagation, Soft wood cuttings, Vernonia.

When the great pandemic caged us inside the walls, hunkering down indoors made good sense whereas in global scenario no one has escaped from the impact of pandemic also it has triggered 25 per cent increase in the prevalence of anxiety and depression among human beings (WHO, 2022). This fact is considered as a wake-up call to all countries to set up better mental health services and human welfare. The pandemic COVID-19 had generated some interest in and concern for the mental health. Also, it has revealed the world about the historical under-investment in the mental health services, thus it is the high time for countries to act urgently to ensure the mental health of their citizens.

The renowned psychologist Erich Fromm introduced the term 'Biophilia' which means 'attraction towards the nature' yes, the genetically predetermined habit of gazing the nature automatically pacifies the soul and mind of human beings as because the mankind was born and bonded with the nature. The solution to reduce the anxiety and stress cannot be achieved by eliminating nature or by isolating our lives from nature (Koay and Dillion, 2020). Opening the windows and allowing the nature to extend its branches from outdoor to indoor may be one of the best options to be considered for calming our soul. Here comes the concept of 'Bio-walls' which is otherwise called as 'living walls' the simplest and versatile component in gardening which requires minimal space and less maintenance that reinforce eco-friendly interiors, reduces CO_2 emission, improves air quality and soothes human mind (Dedhia, 2022 and Rodiek, 2022).

The plant *Vernonia elaeagnifolia DC* is considered as the best suited plant for Bio walls. It is an extensive perennial, woody, ornamental climber. The plant is grown as an ornamental plant in houses and gardens especially on fencing compound walls and buildings which reaches up to 7-8 m in height. It is a popular climber for screening. As the slender stems finds it difficult to climb without support, they climb up and then fall beautifully over a wall or railing forming a curtain hence the name curtain creeper. It is a foliage plant grown primarily for its habit of forming green curtain. The plants are evergreen and prefers full sunlight and water requirement is little and the growth rate of the plant is fast. The plant is propagated by stem cuttings and as the plant matures it changes its colour from green, silver and grey.

The stems are observed to be very tender; the propagation and maintenance of this creeper seems to be difficult and the research on this creeper is scarce. In view of the above, present study entitled 'Clonal propagation of *Vernonia elaeagnifolia DC'* was attempted to find out the best propagating technique for the creeper which may helpin improving the maintenance of the plant, also by

[1]Department of Floriculture and Landscaping Architecture, SRM Urban Farm Centre, SRM College of Agricultural Sciences, SRM Institute of Science and Technology, Kattankulathur-603 203, Tamil Nadu, India.

[2]Department of Natural Resource Management, SRM College of Agricultural Sciences, SRM Institute of Science and Technology, Vendhar Nagar, Chengalpattu-603 201, Baburayenpettai, Tamil Nadu, India.

[3]Department of Horticulture, SRM College of Agricultural Sciences, SRM Institute of Science and Technology, Vendhar Nagar, Chengalpattu-603 201, Baburayenpettai, Tamil Nadu, India.

Corresponding Author: R. Angelin Silviya, Department of Natural Resource Management, SRM College of Agricultural Sciences, SRM Institute of Science and Technology, Vendhar Nagar, Chengalpattu-603 201, Baburayenpettai, Tamil Nadu, India.
Email: angelinr@srmist.edu.in

How to cite this article: Kanimozhi, C., Silviya, R.A. and Gopu, B. (2025). Clonal Propagation of *Vernonia elaeagnifolia*. Agricultural Science Digest. 45(3): 555-558. doi: 10.18805/ag.D-5707.

Submitted: 12-11-2022 **Accepted:** 30-06-2023 **Online:** 20-07-2023

standardizing the techniques, the use of this creeper in the bio walls can be improved which may help us in creating an eco-friendly building and adds aesthetic sense to the surroundings.

A study entitled 'Clonal propagation of *Vernonia elaeagnifolia* DC was carried out to develop a suitable propagation technology for the large-scale production through stem cuttings in Vernonia under mist chamber condition at SRM UFC, SRMIST, Kattankulathur during the period 2021-2022 (Fig 1).

Treatment details

The softwood cuttings of Vernonia were collected from three-year-old plant and the experiment was tried to elucidate the impact of various cutting diameter as 1 to 1.5 cm, 2 to 2.5 cm and 3 to 3.5 cm in the mist chamber as T_1, T_2 and T_3, respectively. Shoot sprouting and rooting with uniform exogenous application of growth regulator were analyzed. The rooting media, sandy soil and Farmyard manure were mixed thoroughly and cleaned for stones and grasses and the mixture was filled in the beds. The basal ends of the cuttings were dusted with rootex powder as quick dip method for 10 seconds before planting in the rooting medium. The treated cuttings were planted carefully in the beds with a depth of 5 cm in the medium. The completely randomized design (CRD) is imposed with ten replications and the data were recorded for four different growth parameters of Vernonia.

Field observations and statistical analysis

The softwood cuttings of Vernonia plant with different diameter in size collected, were propagated and different observations like stem thickness (cm), stem length (cm), number of roots, maximum root length (cm), minimal root length (cm), number of leaf branches from nodes were recorded after 30th day of planting and the all the data obtained from the experiment were statistically analyzed by following standard ANOVA procedures.

The results pertaining to stem characters *viz*., stem thickness, stem length and number of leaf branches were recorded from the study (Fig 2). The data related to stem thickness reveals that, the highest mean was observed as 3.2 cm in the T_3 followed by T_2 and T_1 which showed the mean values as 2.15 and 1.3 cm, respectively. The mean stem length of 20 cm was recorded in the T_1 followed by T_2 and T_3 in which, the mean value was 16.7 and 14 cm, respectively. The number of branches in the softwood cuttings of Vernonia showed the mean values as 2.8, 2.4, 2.4 in the treatments T_2, T_3 and T_1, respectively (Fig 3 and 4).

Various root parameters like number of roots, maximum root length and minimum root length were recorded in the study in which the highest mean value of number of roots as 34, 14, 7 and maximum root length as 10.1, 8.3, 5.8 cm was recorded in the T_3 followed by T_2 and T_1, respectively. In the three treatments, the mean value for minimum root length was recorded as 1.35, 3.1 and



Fig 1: Vernonia plant at SRMUFC.



Fig 2: Number of leaf branches and number of roots in vernonia at 30th day after planting under mist chamber condition.

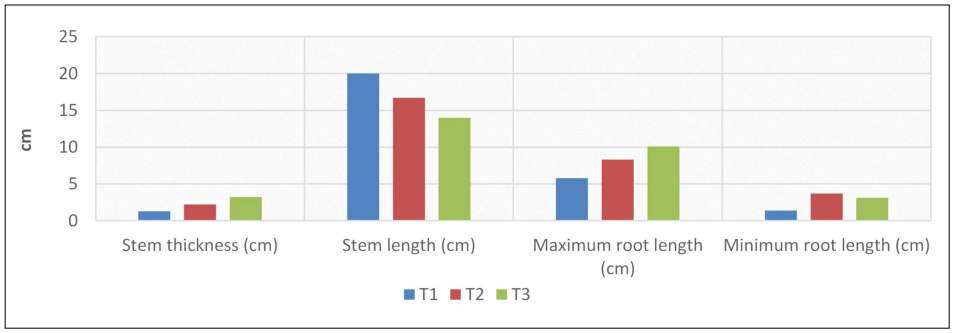

Fig 3: Performance of softwood cuttings on different growth parameters of Vernonia on under mist chamber condition.

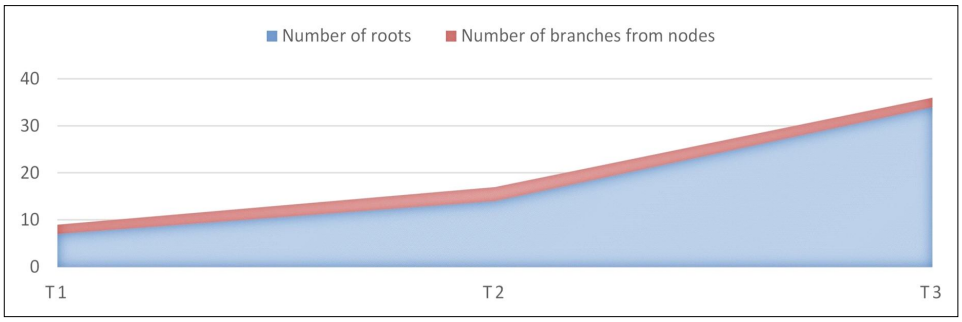

Fig 4: Effect of different softwood cuttings on number of roots and number of branches from nodes in Vernonia.

3.65 cm in the treatments as T_1, T_3 and T_2, respectively (Fig 3 and 4). It is evident that the softwood cuttings with T_3 significantly recorded higher values of different growth parameters of Vernonia followed by the T_2 and T_1.

Chaturvedi (2001) recorded that the presence of increased levels of auxins, higher levels of carbohydrates, higher C:N ratio and reduced levels of the inhibitory substances were observed in the thicker cuttings of different plants in comparison to the thinner cuttings and these attributes in the thicker cuttings recorded significantly higher rooting characters in the thicker cuttings and similar findings were reported by Singh *et al.* (2011); Damar *et al.* (2014); Mehta *et al.* (2018) and Singh *et al*. (2021).

In tree species, significantly more leaves were observed in matured basal cuttings than the tender apical cuttings (Soundy *et al.,* 2008). Kesari *et al.* (2009) recorded that in which they have recorded that the in the mature stem cuttings of *Pongamia pinnata*, presence of higher levels of auxins and carbohydrates influenced the adventious. Dvin *et al.* (2011) observed that in the matured cuttings of apple clonal rootstocks, the maximum root length was recorded by treating it with IBA.

Similar results were reported by Mishra and Kumar (2014) where the mature cuttings of *Commiphora wightii* showed better results by placing in the mist chamber. It may be due to the maintenance of humidity levels that is been maintained in the area surrounding to the plants greatly influenced the different plant growth traits through balancing the transpiration, water level and cooling of plants. Better results were observed by placing the plants in mist chamber where the plants are exposed to lower radiation and higher humidity.

A significant influence of rooting of cuttings was observed in the stem cuttings with higher diameter in the apple clonal rootstock by Verma *et al.* (2015). The presumably increased number of nodes, development of additional leaves and shoot growth development in the thicker cuttings were recorded by the influence of higher IBA level in plants which might have enhanced the cell division and elongation in plants (Singh and Negi, 2014; Debi, 2022 and Rao *et al.,* 2022).

The data recorded in this study reveals that the presence of different growth promoting parameters in the softwood cuttings *viz*., IAA, IBA, carbohydrates, C:N ratio, lesser inhibitory substances *etc*., were significantly higher in the cuttings of higher diameter when compared with lower diameter and this might influence the better rooting patterns and shoot growth parameters in the Vernonia plants with softwood cutting diameter of 3 to 3.5 cm.

CONCLUSION

Sustainability is what the universe long for. Good health, wellbeing, climate action and life on land are the integral components required to achieve the sustainable development goals. In this high time where the stress and anxiety chases human, finding sustainable solutions to maintain the physical and mental health of human triggers into first preference. This sustainability in horticulture can be achieved by adapting effective propagation technologies. Thus, this study with the softwood cuttings

with diameter of 3 to 3.5 cm may be used for effective propagation of the plant *Vernonia elaeagnifolia*. This might help in large scale multiplication of plants and it may be suggested to incorporate in the architecture plans for enhancing the ecofriendly livelihood of human.

Conflict of interest

All authors declare that they have no conflict of interest.

REFERENCES

Chaturvedi, O.P. (2001). Effect of root cutting diameter and planting orientation on spouting, rooting, survival and growth of *Dalbergia sissoo Roxb*. Journal of Tropical Forestry. 17(1): 19-24.

Damar, D., Barholia, A.K., Lekhi, R. and Haldar, A. (2014). Effect of growth regulators and biofertilizers on survival of pomegranate (*Punica granatum* L.) stem cuttings. Plant Archives. 14(1): 347-350.

Debi, A.K. (2022). A critical review: Effect of plant growth regulators on growth and yield of cucurbits. International Journal for Research Trends and Innovation. 7(8): 312-320.

Dedhia, L. (2022). Horticulture Therapy. Agro India. pp. 25-26.

Dvin, S.R., Moghadam, E.G. and Kiani, M. (2011). Rooting response of hardwood cuttings of MM 111 apple clonal rootstock to Indolebutyric acid and rooting media. Asian Journal of Applied Sciences. 4(4): 453-458.

Kesari, V., Krishnamachari, A. and Rangan, L. (2009). Effect of auxins on adventious rooting from stem cuttings of candidate plus tree (*Pongamia pinnata* L.), a potential biodiesel plant. Trees. 23: 597-604.

Koay, W.I. and Dillion, D. (2020). Community gardening: Stress, wellbeing and resilience potentials. International Journal of Environmental Research and Public Health. 17: 2-31.

Mehta S.K., Singh, K.K. and Harsana, A.S. (2018). Effect of IBA concentration and time of planting on rooting in pomegranate (*Punica granatum* L.) cuttings. Journal of Medicinal Plants Studies. 6(1): 250-253.

Mishra, D.K. and Kumar, D. (2014). Clonal propagation in *commiphora wightii* (Arnott) bhandari. Journal of Forest and Environmental Science. 30(2): 218-225.

Singh, B., Singh, S. and Singh, G. (2011). Influence of planting time and IBA on rooting and growth of pomegranate (*Punica granatum* L.) Ganesh cutting. International symposium on pomegranate and minor including mediterranean fruits. Acta Horti. 890: 183-188.

Singh, K.K. and Negi, B. (2014). Effect of various concentrations of IBA and length of cutting on the rooting in stem cutting of *Ticoma stans* L. under mist chamber. International Journal of Current Research. 6(12): 10946-10949.

Singh, S.D., Singh, R.K.D., Langpoklakpam, B. and Hijam, R. (2021). Effect of IBA concentrations and length of hardwood cuttings on rooting performance of pomegranate (*Punica granatum* L.) cv. Bendana. International Journal of Current Microbiology and Applied Science. 10(1): 1540-1547.

Soundy, P., Mpati, K.W., Toit, E.S.D., Mudau, F.N. and Araya, H.T. (2008). Influence of cutting position, medium, hormone and season on rooting of fever tea (*Lippia javanica* L.) stem cuttings. Medicinal and Aromatic Plant Science and Biotechnology. 2(2): 114-116.

Rao, V.N., Saxena, D., Bhupathireddy, B. and Kaur, R. (2022). The effect of different concentrations of IBA on hardwood and softwood cuttings of *Punica granatum*. International Journal of Botany Studies. 7(4): 112-116.

Rodeik, S. (2022). Influence of an outdoor garden on mood and stress in older persons. Journal of Therapeutic Horticulture. 13: 13-21.

Verma, P., Chauhan, P.S., Chandel, J.S. and Thakur, M. (2015). Effect of the size of cuttings (Length and diameter) on rooting in cuttings of apple clonal rootstock Merton 793. Journal of Applied and Natural Sciences. 7(2): 602-606.

World Health Organization (WHO). (2022). News Release on 'Covid 19 Pandemic Triggers 25% Increase in Prevalence of Anxiety and Depression Worldwide'.