

A novel approach for round the year propagation of *Cinnamomum tamala* (Buch.-Ham.) T. Nees. & Eberm. through air layering

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(Manuscript Received: 01-08-2020, Revised: 22-08-2021, Accepted: 01-09-2021)

Keywords: *C. tamala*, Indian bay leaf, mass multiplication, nursery, *tejpat*

Indian bay leaf or *tejpat* (*Cinnamomum tamala* (Buch.-Ham.) T. Nees. & Eberm.) is a perennial spice grown for its aromatic leaves. It is naturally distributed in the Himalayan states of Assam, Himachal Pradesh, Jammu and Kashmir, Meghalaya, Mizoram and Sikkim. At the same time, it is cultivated in the states of Andaman and Nicobar Islands, Arunachal Pradesh, Karnataka, Kerala, Maharashtra, Manipur, Meghalaya, Tamil Nadu and Uttarakhand (Rani *et al.*, 2017). In native regions, the species is generally propagated through seeds (Sharma *et al.*, 2009); however, air layering has been recommended for multiplying superior types

(Purohit *et al.*, 2011). The spice is gaining popularity among the farmers of the Andaman Islands, and there is a steady demand for quality planting material. As flowering is not noticed in the species under Island conditions, air layering is the available option for multiplication of Indian bay leaf.

To meet the planting material requirement of the Island farmers, elite mother plants are being multiplied through air layering. However, the operation is season bound and is generally practised in the rainy season only. Our previous studies on cinnamon (*Cinnamomum verum* J. Presl.) suggested that environmental conditions



Fig. 1. General view of air layered potted plant in polyhouse under the proposed method



Fig. 2. Separated air layers from the mother plants in the proposed method

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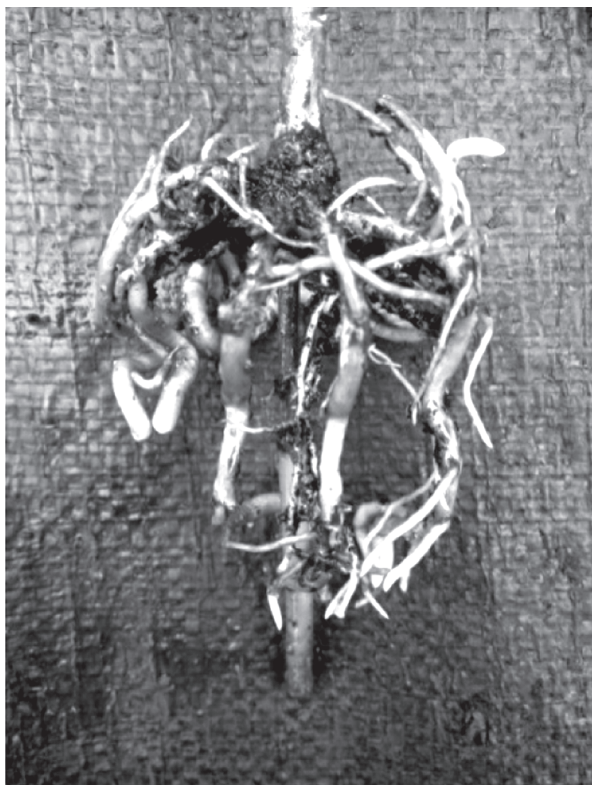


Fig. 3. Root growth in air layers after seven weeks of layering in the proposed method

play an important role in root induction, and the success of layering varied among the season (Waman and Bohra, 2018). To supplement regular seasonal production of planting material, off-season production would be of advantage. Hence, an attempt was made to study the possibility of air

layering under polyhouse conditions during the dry period of the year.

Hardened air layers of Indian bay leaf were planted in pots (22 L size) filled with soil and FYM (3:1, v/v). Plants were allowed to grow for one year under a naturally ventilated polyhouse provided with overhead mist. These plants served as mother plants, and air layering was carried out on selected branches during the dry season, *i.e.*, the second week of April 2020. On selected branches, a ring of the bark of about an inch was removed, and indole-3 butyric acid (2,000 mg L⁻¹) was applied on the cut ends. Twenty-one layers were made for the study. The wound was covered with moistened coir pith compost and wrapped with polythene (Fig. 1). Mother plants were watered regularly, and misting was done twice a day to create humidity. To compare the performance of the proposed method with the conventional method, 76 air layers were made during the first week of July 2020 (rainy season) following the procedure mentioned above. After seven weeks of operation in the proposed method, layers were separated, observations were recorded (Fig. 2 and 3). Layers were ready to harvest after nine weeks in the conventional method.

Results presented in Figure 4 indicate that rooting was induced in 100 per cent layers in the proposed method against 85.4 per cent in the conventional method. The mean number of primary roots (NoPR) per layer were 10.6 ± 0.78 in the

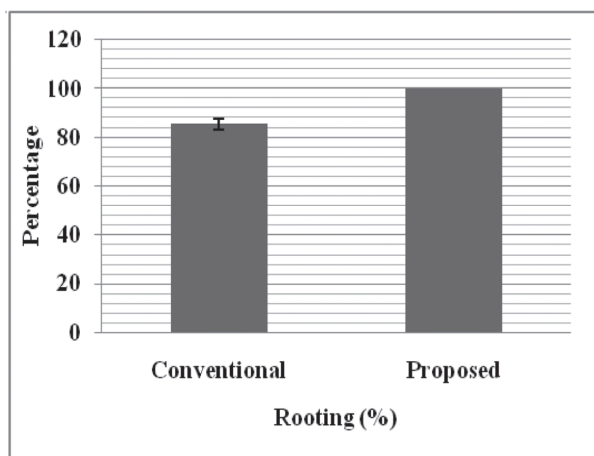


Fig. 4. Rooting percentage in the conventional and proposed method of air layering in Indian bay leaf

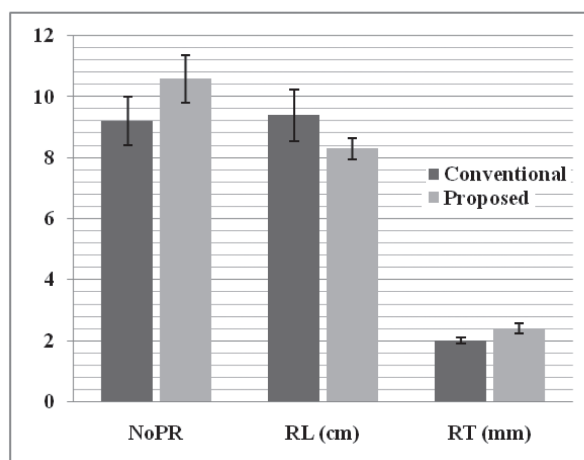


Fig. 5. Root growth parameters in the conventional and proposed method of air layering in Indian bay leaf

proposed method (Fig. 5), which remained comparable with those produced under field conditions (9.2 ± 0.79 roots per layer). The mean length of the longest root (RL) was marginally higher in the conventional method (9.4 ± 0.85 cm) than the proposed method (8.3 ± 0.34 cm). Thicker roots (RT) were produced in the proposed method (2.4 ± 0.17 mm) than the conventional method (2.0 ± 0.09 mm). Interestingly, layers in the proposed method were harvested in the last week of May, when the cumulative rainfall during the experimental period was less than 30.0 mm, as against more than 730 mm during the experimental period in the conventional method.

Previously, a maximum of 60 per cent success in air layering has been reported in the species in field condition of Uttarakhand (Purohit *et al.*, 2011). Considering the superior rooting success and root growth in layers, the present method involving air layering in potted mother plants maintained in the polyhouse provided with misting facility could help in the off-season production of planting material of Indian bay leaf. Various advantages and applications of the technique are as follows.

1. Indian bay leaf responds very well to pruning, and harvesting layers serves as a pruning operation to the plants. Hence, air layering operations could be carried out 3 to 4 times a year on the same plant, thereby facilitating year-round production of plants.
2. During heavy rainfall, layering under field condition is challenging and hence, this technique could also serve as a supplement to on-field layering during the rainy season.
3. This technique could also help in the mass multiplication of unique/superior/rare types wherein only a few mother plants are available

for multiplication. For example, *tejpat* from Uttarakhand has received Geographical Indication status, and through this method, it could be mass multiplied.

4. The technique could also be applicable to other species, which could be propagated using air layering.

Thus, the proposed technique could be beneficial to the nurserymen and researchers for round the year production of planting material of Indian bay leaf apart from serving as a supplement to field level multiplication.

Acknowledgement

The authors are thankful to Director, ICAR-CIARI, Port Blair, for providing the necessary facilities for conducting the study.

References

- Purohit, V.K., Singh, S., Nautiyal, A.R., Prasad, P., Andola, H.C. and Gairola, K.C. 2011. Propagation of *Cinnamomum tamala* through air layering- a simple and clonal method of propagation. *National Academy Science Letters* **34**: 253-256.
- Rani, A., Pande, C., Tewari, G. and Patni, K. 2017. A review on aroma profile of *Cinnamomum* species in North and North East India. *World Journal of Pharmaceutical Research* **6**: 200-221.
- Sharma, G., Nautiyal, B.P. and Nautiyal, A.R. 2009. Seedling emergence and survival in *Cinnamomum tamala* under varying microhabitat conditions: conservation implications. *Tropical Ecology* **50**: 201-209.
- Waman, A.A. and Bohra, P. 2018. Air layering in cinnamon (*Cinnamomum verum* L.) under wet humid tropical conditions. *Journal of Spices and Aromatic Crops* **27**: 71-73.