BRANCH CUTTING PROPAGATION OF *CINNAMOMUM INERS* REINW. AND *CINNAMOMUM ZEYLANICUM* BREYN

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Introduction

Branch cutting propagation has becomes necessary to develop quick and economical methods for cloning of forest trees. This method appears to be promising since it preserves desirable genotypic characteristics for successful multiplication of clones for planting purposes (Bhatnagar, 1977; Gupta and Chandra, 1979; Gupta et al. 1989), where a superior genetic gain may be obtained and quickly utilised in forestry (Lindgren, 1977). The study objectives were to examine the possibility of raising stock plants from mature trees of Medang Teja (*Cinnamomum iners* Reinw.) and Kayu Manis (*Cinnamomum zeylanicum* Breyn) through branch cutting technique and also to evaluate whether tree species, rooting hormone, and branch positions have any effect on shoot and root growth performance.

Materials and Methods

A total of 360 cuttings were derived from a 2 x 2 x 3 factorial combination of 2 tree species, 2 hormonal treatments, and 3 branch positions as a source of cuttings with 30 replications. After treatment, the cuttings were planted in concrete block-wall containing coarse sand as a rooting medium for about 90 days before being uprooted. Polyethylene tent and 70% shade black net were used to cover the cuttings from further desiccation. Cuttings were watered profusely thrice a day using manually controlled mist spray. Observation were made on the presence of callus formation, number and length of shoots and roots, and fresh and dry weight of shoots and roots. The one-way analyses of variance were used to test significant difference ($p \leq 0.05$) in accumulated number of roots, shoots, and root and shoot fresh and dry weight.

Results and Discussion

Sprouted cuttings were observed within five days after planting and the initial overall percentage of sprouted cutting was 51%. High mortality of cuttings, however, has devastated the survival of sprouted cuttings, which have caused 79% of cutting mortality. This resulted in low percentage of survived sprouted cuttings, cutting survival, rooting, and callusing for both species (<50%). The overall percentage of survived sprouted cuttings for both species was 21%. The survivals of alive cuttings also tend to decrease, with the overall percentage of 16%. Whereas rooting percentage was 0.6%, followed by 17% of callused cuttings. Cuttings of *Cinnamomum zeylanicum* Breyn were found to have the highest percentage of survived sprouted cuttings (87%), cutting survival (77%), rooting (0.6%), and callused cuttings (73%); compared to *Cinnamomum iners* Reinw. cuttings with 13% in survived sprouted cuttings, 23% in cutting survival, 0% in rooting, and 27% in callused cuttings respectively. These results also show that sprouting and rooting capabilities for both species tend to decrease from basal to apical parts of the branch. A difference in growth performance indicates that most of the food reserves in cuttings were allocated for shoot growth rather than root growth. The application of 0.2% IBA talcum also had no significant effect on root growth performance. The incidence of damping-off disease triggered by fungal infection was also found to be a major problem in raising branch cuttings, due to inability of cuttings to root successfully.

Conclusions

The cloning of *Cinnamomum iners* Reinw. and *Cinnamomum zeylanicum* Breyn mature trees through branch cutting propagation is possible since superior genotypic nature of cuttings was expressed even at the early stage of its development. Thus, further investigations concerning several eco-physiological factors should be carried out in the future.

References

Bhatnagar, H. P. 1977. A note on rooting of branch cuttings of Chir (*Pinus roxburghii* Sarg.). *Indian Forester*. 103 (5): 369–370.

Gupta, M.P. and J.P. Chandra. 1979. Vegetative propagation of coniferous forest tree species from branch cuttings with the help of mist chamber. *Indian Forester*. 105 (6): 451–457.

Gupta, B.B. Kumar, A. and Negi, D. S. 1989. Rooting response of branch cuttings of *Melia azedarach* L. *Indian Journal of Forestry*. 12 (3): 210–214.

Lindgren, D. 1977. Possible advantages and risks connected with vegetative propagation for reforestations. Pp. 9 – 16 in Vegetativ Propagation of Forest Trees: physiology and practice (Vegetativ Förökning av Skogsträd: fysiologi och praktik). Lectures from a symposium in Uppsala, Sweden, 16–17 February, 1977. The Institute of Forest Improvement and The Department of Forest Genetics, College of Forestry, The Swedish University of Agricultural Sciences. p.159.

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