

Study on Vegetative Propagation of *Camellia japonica* L. (Tea Rose)

J.H.C.M. Fernando and L.M.H.R. Alwis
Uva Wellassa University, Badulla, Sri Lanka

Introduction

Camellia japonica (the Japanese Camellia) is one of the best known species of the genus *Camellia* and this genus is comprising more than 200 species, includes evergreen shrubs and trees belonging to the Theaceae family, which are grown mainly for the preparation of tea with the leaves and buds, for the seeds in order to obtain oil, and as ornamental plants. Among the *Camellia* species, the economic value of the *C. japonica* ranks the highest due to its beautiful ornamental flowers. *C. japonica* is highly spread in up country regions of Sri Lanka such as Nuwara Eliya and Hakgala. It is highly propagated vegetatively using stem cuttings. When vegetative propagation is being done, the nursery is the first and one of critical points in propagation. Nursery soil is highly affected for the vigorous growth of any plant. It affects for the rooting efficiency, presence of pests and diseases, nutrient availability, etc. Therefore, this study was aimed to identify the most effective propagation type and soil medium for two selected *C. japonica* varieties in the nursery.

Methodology

Two varieties of *C. japonica* which bloom white and pink color flowers were selected for the experiment. They were collected from the Hakgala Botanical Gardens and the experiment site was a land at Uva Wellassa University premises. In the experiment, four soil media, two propagation types were used. Four soil media were, only top soil (control/M₀), Top soil and rooting hormone (M₁), Top soil, coir dust (1:1) and rooting hormone (M₂), Top soil (top layer), tea waste (bottom layer) (1:1) without mixing and rooting hormone (M₃). The number of roots and root length were measured in each cutting after 85 days from planting. The average weighted root quantity (AWRQ) was calculated and analyzed by using three factor factorial CRD design (Minitab 16 version).

Results and Discussion

According to the table 1, there is an interaction to AWRQ with all factor combinations. However, at 95% significance level, only the variety ($p = 0.032$), rooting medium ($p = 0.051$) and variety X rooting medium interaction ($p = 0.044$) are significantly different. According to the results showed in table 2, there is an interaction effect with variety and the rooting medium, but only the variety ($p = 0.048$) is significantly different. By considering the mean values of AWRQ, the best variety was pink flower variety (AWRQ = 0.0508). The interactions between

Table 1. General Linear Model: AWRQ versus bed type, variety and rooting medium.

Source	DF	Seq SS	Adj SS	Adj MS	F	P
BT*	1	0.0116	0.0116	0.0116	2.19	0.149
VR**	1	0.0265	0.0265	0.0265	5.00	0.032
RM***	3	0.0457	0.0457	0.0152	2.88	0.051
BT X VR	1	0.0066	0.0066	0.0066	1.24	0.275
BT X RM	3	0.0324	0.0324	0.0108	2.04	0.128
VR X RM	3	0.0481	0.0481	0.0160	3.03	0.044
BT X VR X RM	3	0.0343	0.0343	0.0114	2.16	0.112
Error	32	0.1695	0.1695	0.0053		
Total	47	0.3746				

S = 0.0727752 R-Sq = 54.76% R-Sq(adj) = 33.55%

*BT - Bed Type, **VR - Variety, ***RM - Rooting Medium

Table 2. Two-way ANOVA: AWRQ versus variety and rooting medium.

Source	DF	SS	MS	F	P	Mean
VR	1	0.0265	0.0265	4.16	0.048	White- 0.0039 Pink- 0.0508
RM	3	0.0457	0.0152	2.40	0.083	
Interaction	3	0.0481	0.0160	2.52	0.071	
Error	40	0.2545	0.0064			
Total	47	0.3746				

S = 0.07974 R-Sq = 32.10% R-Sq(adj) = 20.22%

variety, rooting medium, bed type (p = 0.112), bed type, rooting medium (p = 0.128) and bed type, variety (p = 0.275) were insignificant. Therefore, it reveals that there is no effect of bed types as raised open beds and raised beds in propagators on rooting of cuttings.

According to Denby (1950) it was revealed that the stem cuttings of *Camellia japonica* were not satisfactorily rooted in the presence of rooting hormone. The climatic condition of experimenting site was also not fine because of the severe sunlight, high temperatures as well as less precipitation. Further June to September is not the proper period of establishing Tea cuttings in Uva region, Sri Lanka. It usually falls on January to April (Kathiravetpillai and Kulasegaram, 2008).

Conclusion

In the first attempt to identify the rooting efficiency of *Camellia japonica*, the pink flower variety was the most efficiently rooted variety and top soil which is not mixed with rooting hormone was the best rooting medium as the nursery soil.

References

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