

VARIATION IN AIR-LAYERING RESPONSE OF EIGHT GENOTYPES OF *PERSEA BOMBYCINA* KOST

RAJA RAM, M. V. SAMSON* AND M. M. BHATT

Regional Sericulture Research Station, Sahaspur, Dehradun (Uttarakhand)

Introduction

Persea bombycina Kost locally known as 'som' is a medium sized evergreen plant with spreading branches. Its leaves are fed to the Muga silkworms (*Antheraea assama* Ww) in the North-East region and Coochbihar district of West Bengal for raising Muga cocoons commercially. The plants are distributed in tropical, subtropical, moist and temperate regions throughout the Himalayan belt of India. Som plants are commercially raised through seeds (Chaudhary, 1981). Due to open pollination, genetic diversity exists in this species (Jolly *et al.*, 1979; Yadav *et al.*, 1985). Eight genotypes of *Persea bombycina* Kost were identified on the basis of morphological characters (Raja Ram *et al.*, 1993).

Vegetative propagation is the only method through which true to type genetically diverse plant types may be multiplied. Regeneration of elite plants through vegetative means can improve the yield in shorter span of time with uniform desired characters such as good branching system, dwarf ness, suitability for silkworm feeding and resistance to disease and insect and pests. Propagation through air layering has been successfully carried out to propagate sericultural host plants (Singh and Jolly, 1969; Yadav *et al.*, 1989, 1990; Raja Ram *et al.*, 1993). Approximately 70% success has been achieved through air layering in som and soalu (Thangavelu *et al.*, 1988). Differential morphotypic variation was observed in rooting per cent, number of primary roots, number of secondary roots, number of leaves and sprouting in different morphotypes of *Machilus bombycina* through cuttings (Sengupta *et al.*, 1993). Differential genetic response to air layering was observed in *Terminalia* also. The genotypes belonging to *Terminalia arjuna* Var. *arjuna* group responded better as compared to others with respect to rooting percentage, number of primary roots and length of primary roots, etc. (Priya Ranjan *et al.*, 1992). The variation in rooting characters of morphotype in *Percia bombycina* through air layering has not been investigated so far. Therefore, an attempt has been made to study the variation in rooting per cent, number of primary roots, number of secondary roots, root length and survivability per cent in 8 genotypes of *P. bombycina*.

Material and Methods

Eight genotypes of *Persea bombycina* Kost maintained at Regional Muga Research, Boko, Assam were used for this study. Air layering were prepared during the rainy season on each genotype of *P. bombycina*. There were 24 combinations (8 genotypes \times 3 replications) in total and 20-air layering were made in each combination. About 1.5 cm. wide girdle was made by removing the bark with the help of a sharp knife. A ball of the rooting media made from wet sawdust was placed around the girdle and was wrapped by transparent (400 gauge thick) alkathene sheet of 25 \times 25 cm. size. Both the ends were tied firmly with twine thread to retain moisture. The air layerings were checked periodically for root initiation. Finally, air layerings were detached from the mother plant after 3 month after completion of rooting. The data for rooting percentage, number of primary roots, numbers of secondary roots, length of longest root, average length of the roots were recorded. After recording data, the layers were transplanted in the field. Finally, survival percentage of rooted cuttings was recorded after three month of the plantation.

Results and Discussion

A wide range of variation was observed for air layering among different genotypes of *Persea bombycina* with reference to different characters (Table 1). The rooting per cent was significantly higher (90 %) in genotype S8 followed by 70 % in genotype S6 and lower 50 % in genotype S1 and genotype S4. Variation between genotype S1, S4, S7; S2, S3, S5 and S2, S6 was not significant.

Average number of primary roots per air layering was significantly higher (15.64) in genotype S5 followed by 13.23 in genotype S 8 and lowers (2.01) in genotype S2. No significant variation was observed in respect of the primary roots between genotype S1, S2, S4 and genotype S6, S8.

Average number of secondary roots per air layering was significantly highest (52.49) in genotype S6 followed by 48.77 in genotype S5 and lowest (3.01) in genotype S1. Number of secondary roots between genotype S1 and S2; S1 and S3; and S3 and S4 were not significant.

*28/A, 6Church street, Kaliancant, Nagereoil, Tamil Nadu

Table 1
Rooting in different genotypes of Persea bombycina Kost.

Genotypes	Rooting percentage	Average number of primary roots	Average number of secondary roots	Length of the longest root (cm)	Average Length of the root (cm)	Survival percentage
S1	50.00	2.52	3.01	3.77	2.98	33.33
S2	66.66	2.01	1.00	2.70	2.48	32.54
S3	60.00	8.72	7.83	6.02	3.97	63.73
S4	50.00	2.99	5.07	7.11	6.07	46.63
S5	63.33	15.64	48.97	9.77	5.57	55.56
S6	70.00	12.95	52.49	10.65	8.05	59.49
S7	56.66	11.33	18.84	7.18	4.94	49.99
S8	90.00	13.23	33.88	10.28	6.06	81.33
C.D.at. 5 %	7.73	0.68	5.10	1.19	0.90	7.52

The length of the longest root was significantly higher (10.65 cm.) in genotype S6 from the other genotypes barring the genotype S5 and S8 and significantly lower (2.70 cm.) in genotype S2 from all the genotypes barring the genotype S1. No significant variation was observed in longest root of genotype S3 and S4; S5 and S7; and S6 and S8.

The average length of the roots was also significantly higher (8.05 cm) in genotype S6 from all the genotype and significantly lower (2.48 cm) from all the genotype barring S1 (2.98 cm). Average length of the roots between genotype S1 and S2; S4 and S5; and S5 and S7 was non significant.

The survival percent was similar and significantly higher (81.54 %) in genotype S8 from all the genotypes followed by 63.63 % in genotype S3 and lower (32.54%) in genotype S2 from all the genotypes barring S1 (33.53%). Survival percent was insignificant between genotype S1 and S2; S3 and S6; and S5 and S7.

All the 8 genotypes are distributed in North-East India. Air layerings were prepared during rainy season. Rainy season is more favorable due to young current shoot growth, active growing season and high humidity to favour rooting of cuttings (Loach, 1988).

The results show that in air layering prepared from different genotypes, the rooting per cent and other characters were varied from each other due to genetic variability (Yadav *et al.*, 2000) in morphotypes. Sprouting, rooting ability, rooting characters and survival per cent in different varieties of mulberry has also been reported by Chakraverty *et al.*, 1991, Sen *et al.*, 1993 and Tikader and Ray, 1997. The highest root length in genotype S6 may be early root initiation in this genotype. The length of the root reflected the effect of the early and late rooting initiation (Raja Ram and Samson, 1995).

The survival percentage was totally dependent on the number of roots per air layering and mean root length. The survival percentage was highest in genotype S8 where the number of roots per air layering was high (13.23) nearest to genotype S5 (15.64) and length of the roots was also high (10.28 c.m.) nearest to genotype S6 (10.68 c.m.). Similarly, the survival percentage was lowest in genotype S2 due to less number of roots and root length in genotype S2. Hence, it may be concluded from the present investigation that multiplication through vegetative propagation by air layering may serve as an important means for mass scale multiplication of *P. bombycina*.

SUMMARY

Persea bombycina Kost is a primary food plant of muga silkworm, *Antheraea assama* Ww. Phenotypic variability was studied in eight genotypes of *P. bombycina* for rooting percentage and other root characters through air layering propagation. A wide range of phenotypic variability was observed for rooting percentage, number of primary roots, number of secondary roots, length of the longest root, average length of the root and survival. The maximum rooting percentage (90.00%) and survival percentage (81.54 %) was found in genotype S8 and minimum rooting percentage (50.00%) and survival percentage (32.49 %) in genotype S2.

Key words: *Persea bombycina*, *Antheraea assama*, Air layering, Genotypes

परसिया बोम्बीसाइना कोस्ट के 8 अनुवंशों के गुटिका बंधन प्रतिचार में विभिन्नता

राजा राम, एम.वी. सेमसन और एम.एम. भट्ट

सारांश

परसिया बोम्बीसाइना कोस्ट, मूंगा रेशम कीट एन्थीरिया आसामा डब्ल्यू डब्ल्यू का एक प्राथमिक भोज्य पौधा है। जिसकी पत्तियाँ मूंगा रेशम कीट पालन में प्रयोग की जाती हैं। परसिया बोम्बीसाइना के आठ अनुवंशों में गुटिका बंधन द्वारा जड़ निकलने की प्रतिशत और जड़ के अन्य गुणों में भिन्नता का अध्ययन किया गया। प्राथमिक जड़ों की संख्या, द्वितीयक जड़ों की संख्या, सबसे लम्बी जड़ की लम्बाई, जड़ों की औसतन लम्बाई तथा जीवित रहने की स्थिति में विभिन्नता की

अत्याधिक सीमा रहती देखी गई। जड़ निकलने की सार्थक प्रतिशत सबसे अधिक (90.00 प्रतिशत) और जीवित रहने की सार्थक प्रतिशत (81.54 प्रतिशत) अनुवंश आठ में पाया गया तथा जड़ निकलने की सार्थक प्रतिशत सबसे कम (50.00 प्रतिशत) और जीवित रहने की सार्थक प्रतिशत (32.49 प्रतिशत) अनुवंश दो

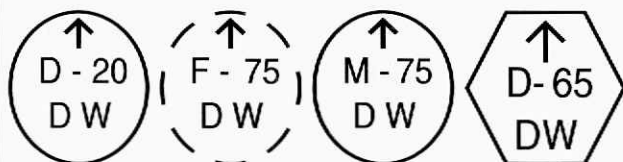
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