



ROOTING AND GROWTH ASSOCIATES IN AIR LAYERING OF SAL (*SHOREA ROBUSTA* GAERTN. f.)

POOJA YADAV¹, PREM CHAND GYANI² AND G.S. YADAV^{3*}

¹Department of Genetics and Plant Breeding, Rajmata Vijayaraje Scindia Krishi Vishwa Vidyalyaya, Race Course Road, Gwalior 474002, Madhya Pradesh, India.

²Basic Seed Multiplication and Training Centre, Central Silk Board, Zero Miles Eri Farm Vaya: Sabor, Post Bahadurpur, Bihar 831210, India.

³Puneet Sadan, Lokmanya Tilak Ward No.37, Khalepara Kangoli, Dharampura No.2, Jagdalpur 494001, Chhattisgarh, India.

*Corresponding author email: yadavdrgs@gmail.com

ABSTRACT: The present study is an attempt for artificial regeneration of Sal (*Shorea robusta* Gaertn. f.; family Dipterocarpaceae) by air layering under the conditions of Bastar plateau of Chhattisgarh, India. Forestry in India is a significant and major environmental resource having multifarious uses. Altogether, there are 61 ecoraces of *Antheraea paphia* Linn with a variable frequency distribution on different flora in different forests in the different states of India. The maximum wild ecoraces are Sal based on the natural affinity for food which ultimately associates the frequency distribution and population density of the ecoraces in their ecopockets. One year old plants having 30-40 cm in length, 8.51 mm in thickness, with 5 to 7 number of leaves surmised a rooting of 84.62 ± 14.50 percent with the post transplantation survival to the tune of 88.86 ± 12.61 . The weight of shoot in a rooted air layer, number of leaves, weight of leaves, number of primary roots, number of secondary roots, length of the longest root and weight of roots fairly well remained 9.24 ± 0.82 g 5.38 ± 0.87 in number, 5.51 ± 0.78 g, 7.62 ± 1.26 in number, 37.85 ± 5.76 in number, 15.90 ± 3.23 cm and 1.61 ± 0.27 g respectively. The significant functional correlation was observed only in 17 combinations of traits out of altogether 55 traits (30.90 percent of the total combinations) adducing magnitude of significance at the level of 5 percent to 1 percent. The multiple correlation for the length of shoot evinced significant positive association with the thicknesses of twig ($r=0.794^{**}$, $P<0.01$, $Df=11$), weight of shoot ($r=0.748^{**}$, $P<0.01$, $Df=11$), number of leaves ($r=0.794^{**}$, $P<0.01$, $Df=11$) and weight of leaves ($r=0.734^{**}$, $P<0.01$, $Df=11$). Thus, with the increasing length of shoot the thicknesses of twig, weight of shoot, number of leaves and weight of leaves adjudicated an increasing trend. Likewise, there were a positive increase in the weight of shoot ($r=0.683^{**}$, $P<0.01$, $Df=11$), number of leaves ($r=0.883^{**}$, $P<0.01$, $Df=11$) and weight of leaves ($r=0.788$, $P<0.01$, $Df=11$) with the increasing thicknesses of twigs of air layers of *S. robusta*. Multilinear regression with different numbers of predictor variables with a different combination of single response variable were analyzed to compute the associated functional formula of each response variable based on regression constant, regression coefficients and mean value of different predictors variables. Multilinear regression conferred different magnitude of significance with the variable numbers of predictor and response variables. Analysis of Covariance having co variables together for Rooting % and Survival %; Length of shoot (cm) and Length of longest root (cm); Weight of shoot (g) and Weight of leaves (g); Number of leaves and Number of primary roots; Number of leaves and Number of secondary roots; Weight of shoots and Weight of roots; Thicknesses of twigs (mm) and Length of longest roots (cm) elucidated significant Fisher's ratio of covariance between the associates ($F=90.86^{**}$, adjusted error $Df=83$, $P<0.01$) Likewise, Analysis of Covariance for different possible combinations of covariates adjudicated different significant value of Fisher's ratio of covariance. The success to propagate Sal by air layering will confer a new hope in the forestry for artificial regeneration of Sal. The air layered plants with adventitious roots produce dwarf and bushy Sal plants having more foliage, most suitable for rearing to tropical tasar silk insect *Antheraea paphia* Linn under nylon net conditions and conservation of wild Sal fed ecoraces.

Keywords: Air layers, artificial regeneration, covariability, growth associates, multilinear regression, *Shorea robusta* Gaertn. f.

Citation: Yadav P, Gyani PC, Yadav GS (2021) Rooting and growth associates in air layering of Sal (*Shorea robusta* Gaertn. f.). Indian J Trop Biodiv 29(2):113-130