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# PREDICTION OF TAPER FOR THE EVEN AGED

*Pinus caribaea*

## TREES IN YAGIRALA FOREST RESERVE



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BY

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2002

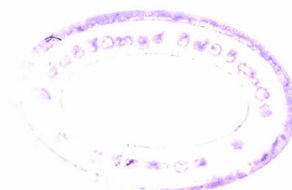
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## ABSTRACT

Taper is the rate of change of diameter over a specified length along the tree stem, which varies not only by species but also by age, diameter at breast height, and tree height. Taper is important for the forester to predict the upper stem diameters especially in volume calculations. Although it is difficult to find taper studies in Sri Lanka, many studies have been carried out in Canada and New Zealand.

The prime objective of the current study is to develop a taper equation for *Pinus caribaea* to predict upper stem diameters for a selected plantation. 25-year-old *P. caribaea* (Morelet) plantation in the Yagirala Forest Reserve was selected for this purpose. The selection of sample plots were carried out randomly after dividing the population into three primary strata i.e., valley, slope and ridge. Data were collected from nine 0.05 ha circular plots and 1053 tree sectional measurements have been collected from these plots. Diameter at breast height and total height of individual trees were used as the explanatory variables. These were used to estimate the parameters for the selected equation originally constructed for Douglas fir in Coastal Central Colombia by Kozak *et al* (1969). In this study, for different sites, three separate models were constructed with different parameter sets with the similar model. Due to the difficulty using separate models, a possibility of using one model for all sites were tested with pooled data using multiple linear regression. Using the common model with new parameters, normal residuals were calculated separately for each site type test the bias using one-way ANOVA. This test indicated the non-significance of the residuals and therefore, it was decided to use the common model for the prediction of tree taper for the selected area.

For testing the sensitivity of the estimated parameters of the common model data were fitted to the original model constructed for Douglas fir without changing its parameters and the residual distribution was tested. The residual distribution indicated that the low sensitivity of the model proving the ability of using in many site types.

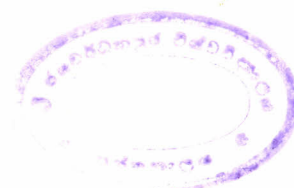


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