



## ALLOMETRIC EQUATION FOR PREDICTING THE CULM DRY-BIOMASS OF *OCHLANDRA TRAVANCORICA* GAMBLE

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**ABSTRACT:** *Ochlandra travancorica* Gamble is a shrubby reed bamboo with restricted distribution and endemic to Southern Western Ghats, naturally occurring in the evergreen and semi-evergreen forests of Kerala. It is an integral part of rural economy of Kerala and is used for mat and basket making, fishing rods, handicrafts, paper making, bamboo ply and weaving. The precise estimation of carbon stocks depends on the availability of allometric equations to estimate biomass. In the present study we tried to develop allometric equations to predict the culm biomass of *O. travancorica*. Three clumps were destructively sampled in April during 2011 and 2012. The culm growth attributes were measured were made in the field and taken to laboratory to estimated the dry biomass Six allometric models based on GBH (G) and height (H) of the culms were used. The allometric models used were  $Y = a_0 + a_1 * G$ ;  $\ln Y = a_0 + a_1 * G$ ;  $\ln Y = a_0 + a_1 * \ln G$ ;  $Y = a_0 + a_1 * G + a_2 * H$ ;  $\ln Y = a_0 + a_1 * G + a_2 * H$  and  $\ln Y = a_0 + a_1 * \ln G + a_2 * \ln H$ . The dependent variables tried were dry weight of the culm, branch, leaf weight and total culm dry weight. The best fit model was determined by coefficient of determination ( $R^2$ ) and Furnival's Index (FI). The best fit equations to predict the culm biomass was  $Y = -0.178 + 0.054 * G + 0.045 * H$ , that of branch biomass was  $Y = -3.732 + 0.083 * G + 0.347 * H$  and that for leaf biomass was  $Y = 0.005 + 0.017 * G - 0.004 * H$ . The best equation to explain the total culm biomass of *O. travancorica* was  $Y = -0.200 + 0.121 * G$ . The findings of the present study will be helpful in precise determination the biomass production this species and there by estimating the carbon stock.

**Keywords:** Allometry, biomass accumulation, biomass prediction, culm, Furnival's index, *Ochlandra travancorica*

**Abbreviations:** AGB- Aboveground biomass, G- Girth at breast height, H- Height, NN- Number of nodes, IL- Internodal length.

**Citation:** Jijeesh CM, Seethalakshmi KK, Anjali K, Fasilkhan N (2021) Allometric equation for predicting the culm dry-biomass of *Ochlandra travancorica* Gamble. Indian J Trop Biodiv 29(1):40-46

### INTRODUCTION

Bamboos are the multipurpose arborescent grass species belonging to the family of Poaceae. Due to its multifarious uses it is elevated to the status of 'timber of the 21<sup>st</sup> century'. Kerala is one of India's key bamboo diversity centres with 22 species of bamboo belonging to seven genera. In Kerala bamboos occur both in natural forests and outside forest areas. During 2004-2005, the entire standing crop of bamboo in homesteads was estimated to be 13.61 million culms, with a green weight of 0.331 million tonnes. Whereas, the bamboo resources in forest regions was assessed

to be 2.63 million culms, based on satellite imaging (Muraleedharan *et al.*, 2007).

*Ochlandra travancorica* Gamble. is a shrubby reed bamboo species endemic to Southern Western Ghats, found naturally in the evergreen and semi-evergreen forests of Kerala (Seethalakshmi and Kumar, 1998). In low-level evergreen and semi-evergreen forests it is commonly found as undergrowth. Pure patches of reed that grow into impenetrable thickets can be found along the stream and river bank, where most of other trees cannot grow. For proper growth, this plant needs diffused light and requires more than 1500 mm of