

Full Research Article

Fractal Branching Model for Non-Destructive Biomass Estimation in *Terminalia chebula* and *Embilica officinalis* Agroforestry Plantations

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Abstract

Fractal branching model is a non-destructive tool for biomass estimation. In the present paper we compared estimates of above ground tree biomass of *Terminalia chebula* and *Embilica officinalis* using usual method of biomass estimates and by employing Fractal Branching Analysis (FBA) model. Allometric equations were developed through FBA for above ground biomass of *Terminalia chebula* ($B=0.1296D^{2.0827}$), branch biomass ($B=0.0103D^{2.5388}$) and leaves+twig biomass ($B=0.0529D^{1.3269}$). Similarly, equations were developed for *Embilica officinalis* for above ground biomass ($B=0.0655D^{2.4042}$), branch biomass ($B=0.0007D^{3.35108}$) and for leaves+twig ($B=0.0656D^{1.621}$) (where B is Biomass and D is diameter of tree at breast height). While comparing the biomass estimate of both the methods using different descriptive statistics it was found that biomass equations developed through FBA model can fairly estimate the biomass as Maximum Error (ME) values ranged from 0.1 to 0.385 in *Terminalia* and from 0.068 to 0.289 in *Embilica*. The Coefficient of Residual Mass (CRM) values for both the species were also less than and near to one signifying good prediction by the FBA model. The experiment also showed that the method is fairly accurate and estimation for large number of trees, with different diameters, can be generated through the model thus saving precious time and resources.