

Forest ecosystems modelling

11 March 2025

Topic: Allometric relationships in practice.

Objectives:

- fitting an allometric model in a nonlinear form in R
- basic analysis of model fitting in R

1. The data used in this practice is a fraction of the data used by Jorge et al. (2023)¹. Please have a look at this work following the link in the citation bellow. Import the data included in the dap_full.csv file
 - a. Use the ggplot2 package and function ggplot() to plot Total_woody biomass as a function of tree diameter under cork. Repeat this exercise for other biomass components.
 - b. Use the nls function that is included by default in R by the Stat packadge to fite an allometric model $Total_woody = a d^b$
 - c. Add the estimates of the fitted model to the plot made in a)
 - d. Verify and discuss model assumptions from the model fitted in b)
 - e. Fit the model $Total_woody = a d^b h^c$. Discuss the results.

¹ Jorge, C.; Tomé, M.; Ruiz-Peinado, R.; Zribi, L.; Paulo, J.A. *Quercus suber* Allometry in the West Mediterranean Basin. Forests 2023, 14, 649. <https://doi.org/10.3390/f14030649>