



## Coarse woody debris density and elemental components by decay classes for ten tree species in Croatia

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Coarse woody debris (CWD), aside its contribution to forest ecosystem productivity and biodiversity, has a significant role in nutrient cycling and carbon storage. Still, CWD chemical features, as well as its density, are less studied in comparison to other plant traits. This is evident from the statistics of the most recent version 5 of TRY Plant Trait Database where CWD traits are underrepresented. Nevertheless, also due to the carbon (C) accounting requirements under UNFCCC and EU regulations, where dead wood (DW) is recognized as one of five mandatory C pools in forest ecosystems, interest in CWD has been increasing. The aim of this research was to provide national DW biomass conversion factors, i.e. dead wood densities (DWD) and C concentrations, which can be used for reporting on C stocks in DW pool. We hypothesize that there are differences in DW biomass conversion factors with respect to tree species group (ring-porous, diffuse-porous, non-porous) and biogeographical region. Additionally, we explored the content of N, K, Ca, P, Mg mineral macronutrients in CWD of different decay classes and tree species.

The research was conducted on ten forest tree species that represent main forest ecosystems in Croatia located in three biogeographical regions, i.e. Continental, Alpine and Mediterranean. In the field, stem discs were sampled from lying CWD, with diameter between 5 and 30 cm, that was categorized into five decay classes, from 0 (raw wood) to 4 (very decayed dead wood). In total, we collected 446 CWD samples evenly distributed between tree species and decay classes. All samples were analysed for density, C and N content, with selected 165 samples analysed further on K, Ca, P, Mg content. Overall, DWD, as expected, showed decreasing trend with respect to decay class, while for C, N and mineral macronutrients no trend regarding decay classes was observed. For each tree species group, DWDs by decay classes were compared between different biogeographical regions. In ring-porous species a significant difference was observed in DWD between samples collected in Continental and Mediterranean biogeographical region for decay classes 0-2, while in non-porous species DWD between samples collected in Alpine and Mediterranean biogeographical region were significantly different for decay classes 2-4. Results on C, N and mineral macronutrients were compared with those published in TRY database and other available sources.

