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ECOPHYSIOLOGY OF FOREST SPECIES IN SOUTH-WEST ROMANIA IN THE CONTEXT OF CLIMATE CHANGE

PANICI P.A.¹, CAMEN D.D.¹

¹Faculty of Engineering and Applied Technologies, University of Life Sciences "King Mihai I" from Timișoara, 119 Calea Aradului, 300645 Timișoara, Romania

Abstract: This study examines the ecophysiological responses of five native forest species in south-western Romania (2021–2024), based on seasonal measurements of net photosynthesis and chlorophyll content, in two contrasting ecosystems: the "Porțile de Fier" Natural Park and the Pădurea Verde Forest in Timișoara. Results revealed significant species- and site-specific differences: black locust and hornbeam showed higher drought tolerance, while ash and sycamore were more sensitive, particularly in dry years. Thermo-hydric stress was more pronounced in urban forests, indicating combined climatic and anthropogenic pressures. The study highlights the need for continuous monitoring to support adaptive forest management strategies. Introduction Seasonal measurements of photosynthesis Climate change, through the increasing and determinations of leaf chlorophyll frequency of extreme weather events, imposes content were made using a portable growing pressure on the functioning of forest chlorophyll meter. The eco-physiological data ecosystems. These conditions directly impact were correlated with local climatic indicators key physiological processes in trees, such as (temperature, precipitation), obtained from photosynthesis and transpiration. In this regional meteorological source. context, the study of the ecophysiology of native species is essential for understanding • Results and discussions adaptive mechanisms to abiotic stress and for Statistical analysis of photosynthetic rate and developing sustainable forest management chlorophyll content (SPAD) in five forest strategies. This paper the examines species (Carpius betulus, Fraxinus excelsior, ecophysiological responses of five forest Robinia pseudoacacia, Acer campestre, Acer species in south-western Romania, across two pseudoplatanus) revealed significant effects contrasting ecosystems, based on (p < 0.05) of species, location, and study photosynthetic parameters and foliar period (April-August), as well as significant chlorophyll content monitored between 2021 interactions between these factors. The and 2024. observed variations suggest differentiated ecophysiological responses of the species to Material and method environmental conditions and seasonal Text The study was conducted between 2021 phenology.

and 2024 and focused on five native forest species: Robinia pseudoacacia (black locust), Carpinus betulus (hornbeam), Acer campestre (field maple), Acer pseudoplatanus (sycamore), and Fraxinus excelsior (ash). The research was carried out in two contrasting ecosystems: the "Porțile de Fier" Natural Park, with sub-Mediterranean influences, and the Green Forest of Timișoara, an urban forest environment.

Conclusions

The results demonstrate a significant influence of species, location, and seasonal phenology on photosynthetic rate and chlorophyll content, reflecting the heterogeneity of ecophysiological responses within the analyzed forest ecosystems.