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HOTOSYNTHESIS AND PHOTOSYSTEM II (PSII) ACTIVITY OF ANATOLIAN CHESTNUT (CASTANEA SATIVA) SAPLINGS GROWN IN POOR SOIL

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Abstract

This study examines the effects of soil impoverishment on the net photosynthesis and photosystem II (PSII) activity of chestnut (Castanea sativa) saplings. Chestnut saplings from Artvin, Ordu, and Isparta in Turkey were grouped together and grown in three soil types: control soil (sapling soil); 30% impoverished soil (two parts soil and one part sand); and 50% impoverished soil (one part soil and one part sand). The saplings were transferred from their original containers into experimental soil-filled containers in an enclosed, windless environment with minimal sunlight. Chlorophyll fluorescence and photosynthetic measurements of the saplings were conducted four weeks after the soil change. Additionally, sapling diameters were measured at weeks 2 and 4. The data indicate that soil impoverishment prevented diameter growth of the saplings. Photosynthetic efficiency (A) and photochemical quantum yield [Y(II)] of chestnut saplings from the Ordu provenance grown on moderately (30%) and severely (50%) impoverished soils were higher than those of saplings from the Artvin and Isparta provenances.

Key words: Anatolian chestnut, life on land, photosynthesis and photosystem, poor soil

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