Original Article

Effect of Drought Stress on Chemical Constituents, Photosynthesis and Antioxidant Properties of *Rosmarinus officinalis* Essential Oil

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Abstract

This research was carried out to assess the effect of drought stress on head branch dry weight, photosynthesis, essential oil yield and radical scavenging of rosemary (*Rosmarinus officinalis* L.) in Islamic Azad University, Shoushtar branch, Iran during 2010-2011. The experiments were carried out using complete randomized block design with four replications and drought stress levels included control, medium stress (75% field capacity) and sever stress (55% field capacity). Medium and sever drought stress increased essential oil percentage. Medium drought stress increase rosemary essential oil yield (7.6 g/m²) compared with control. Sever drought stress decreased essential oil yield (4.1 g/m²), photosynthesis rate (11.7 μ mol Co²/cm²/min) and head branch dry weight (52.7 g/m²). GC/MS results indicated rosemary major oil components include β-Pinene, 1,8-cineole, α-bisabololoxide A, α-pinene and α-bisabolol and drought stress increased these chemical compound compared control. Antioxidant activity was analyzed using the DPPH method. Results indicated that essential oil obtained from medium stress and drought stress exhibited a dose-dependent increase with a radical scavenging effect of 90.0% and 88.0% at 350 μg/ml, compared with BHT (94.0%) at the same concentration. This study showed medium drought stress increased essential oil yield and free radical scavenging capacity in rosemary.

Key words: Rosemary, Drought stress, Lipid peroxidation, Radical scavenging