α-Tocopherol Protection against Drought-Induced Damage in *Rosmarinus officinalis* L. and *Melissa officinalis* L.

Sergi Munné-Bosch[a,*], Karin Schwarz [b] and Leonor Alegre[a]

[a] Departament de Biologia Vegetal, Facultat de Biologia, Universitat de Barcelona, Av. Diagonal 645, 08028 Barcelona, Spain. Fax: ++34 93 41 12 842. E-mail: smunne@porthos.bio.ub.es

[b] Institut für Lebensmittelwissenchaft, Universität Hannover, Wunstorfer Strasse 14, 30453 Hannover, Germany

* Author for correspondence and reprint requests

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Summer diurnal variations of photosynthesis and α-tocopherol content were measured in relation to natural drought in field-grown rosemary (*Rosmarinus officinalis* L.) and lemon balm (*Melissa officinalis* L.) plants. During the summer relative water contents (RWC) of *ca.* 40% in *Rosmarinus officinalis* and *ca.* 30% in *Melissa officinalis* were attained, indicating severe drought. Both species showed similar diurnal patterns of net CO_2 assimilation rates (A) with a wide plateau of maximum photosynthesis at midday in the absence of drought and one peak of maximum photosynthesis early in the morning under drought conditions. Net CO_2 assimilation rates decreased by *ca.* 75% due to drought in both species. *Melissa officinalis* plants showed a significant decrease in the relative quantum efficiency of PSII photochemistry (ϕ_{PSII}), ratio of variable to maximum fluorescence yield (F_v/F_m) and chlorophyll content of leaves by *ca.* 25% under drought conditions at midday. In contrast, ϕ_{PSII}, F_v/F_m and chlorophyll content remained constant throughout the experiment in *R. officinalis* plants. Although the non-photochemical quenching of chlorophyll fluorescence increased from *ca.* 1.8 to 3 and the α-tocopherol content rose fifteen fold in both species in response to drought, only *R. officinalis* plants were able to avoid oxidative damage under drought conditions by the joint increase of carotenoids and α-tocopherol.