

Comparative Study on Gas Exchange, Water Relations and Leaf Anatomy of Two Olive Cultivars Grown under Well-Irrigated and Drought Conditions

Konstantinos Chartzoulakis^{a,*}, Angelos Patakas^b and Artemis Bosabalidis^c

^a NAGREF, Subtropical Plants and Olive Tree Institute, 73100 Chania, Crete, Greece.

Fax: +3082193963. E-mail: agres@cha.forthnet.gr

^b Laboratory of Viticulture, Aristotle University, P.O. Box 236, 54006 Thessaloniki, Greece

^c Department of Botany, School of Biology, Aristotle University, 54006 Thessaloniki, Greece

* Author for correspondence and reprint requests

Z. Naturforsch. **54c**, 688–692 (1999); received November 8, 1998/February 16, 1999

Leaf Anatomy, *Olea europea*, Osmotic Adjustment, Photosynthesis, Drought Stress

The effect of water stress on gas exchange, water relations and leaf anatomical characteristics have been studied in two olive cultivars (*Olea europea*, L. cv. 'Koroneiki' and cv. 'Mastoidis'). Photosynthetic rate as well as stomatal conductance were decreased in stressed plants. Osmotic potential (π) declined rapidly in stressed plants indicating their ability for osmoregulation. Bulk modulus of elasticity (ϵ) was significantly higher in stressed compared to well irrigated plants. The volume fraction of intercellular spaces of the upper palisade parenchyma, the spongy parenchyma as well as the lower palisade parenchyma were significantly lower in stressed compared to well irrigated plants. On the other hand, the density of mesophyll cells in the upper palisade parenchyma, spongy parenchyma and lower palisade parenchyma increased significantly in stressed plants.