**Nitrogen deposition effects on leaf physiology of Mediterranean species**

D. LIBERATI1, L. FUSARO2, M. LOCASCIO3, S. MUNZI4, S. MEREU3,5\*, L. MORILLAS1, C. CRUZ4

*1* *Department of Innovation of Biological Systems, Food and Forestry, Tuscia University, Italy*

*2Department of Environmental Biology, Sapienza University of Rome, Italy*

*3 Department of Sciences for Nature and Environmental Resources, University of Sassari, Italy*

*4Centro de Biologia Ambiental, Universidade de Lisboa, Portugal*

*5Impacts on Agriculture, Forest, and Natural Ecosystems Division, Euro-Mediterranean Center on Climate Change (CMCC), Sassari, Italy*

Atmospheric nitrogen (N) deposition and climate change are among the most relevant drivers of biodiversity loss, also affecting ecosystem functions and services. Consequently, there is a growing need to improve our understanding of their isolated and combined effects. Atmospheric N deposition can alter plant functionality and diversity because of species differences in resource acquisition, resource-use efficiency and allocation, and growth response. Nitrogen deposition might increase also the susceptibility of plants to other biotic and abiotic stresses like drought events increasing shoot:root ratios, changing the response pattern of stomatal conductance to drought, altering the Water Use Efficiency.

We hypothesized that N addition would increase mesophyll conductance in order to support the increased demand for CO2 by an augmented photosynthetic capacity. However, during drought stress, these effects would disappear or even reverse to avoid excessive water loss. The hypothesis will be tested in two Mediterranean sites with similar climatic conditions: Arrábida (Portugal) and Capo Caccia (Italy). Nitrogen treatments in Arrábida started in 2007 with 40 and 80 Kg/ha/y, while in Capo Caccia they were started in 2011 with 30 Kg/ha/y. In order to compare the two sites, the same parameters will be measured, namely the maximum net assimilation rates (Anmax), net assimilation rates, leaf respiration, and stomatal conductance in field conditions, chlorophyll fluorescence, and the foliar N and carbon concentrations in leaves of different age classes. Photosynthetic Nitrogen Use Efficiency (PNUE) will be estimated, paying attention to the relation between PNUE and N pertainingto structural and cell wall materials.