

Effects of water availability on barley genotypes (*Hordeum vulgare* L.) growth: Implications in drought tolerance

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Abstract

Water stress is one of the most limiting factors for the survival of plants in Mediterranean climate which restrict growth, and limit crop productivity. We have studied the behaviour of barley genotypes under drought stress and identified biochemical adaptation mechanism to improve drought tolerance by quantifying ABA and ABA GE content. The morphological study showed that the cultivars Ardhaoui and Pakistan reduced notably their leaf area. The physiological study demonstrated that the genotype Ardhaoui presented high values of the relative water content (RWC) and Manel had the lowest values. The cv. Ardhaoui, cv. Pakistan and var. Roho showed similar reductions of the net assimilation rate. The biochemical study identified that with the exception of cv. Ardhaoui that reduced its content of the conjugated abscissic acid (ABA-GE), water deficit led to increased synthesis of this metabolite in the other genotypes. These results argue for ABA-GE hydrolysis in cv. Ardhaoui and de novo synthesis of ABA in the other genotypes. Antioxidant enzyme response was observed mainly through an increased activity of catalase (CAT). The leaves of the five genotypes were enriched with ¹³C compared to the control. The carbon isotope discrimination ($\Delta^{13}C$) is positively correlated with the net assimilation rate (A), stomatal conductance (gs) and intercellular CO₂ concentration (C_i). The treatment improves the water use efficiency related to biomass (WUE_{biomass}) on the average by 58% for the cultivars Ardhaoui and Pakistan.

Biography

Afwa Thameur has completed her Ph.D in Biology at the age of 30 years from Tunis El Manar University and postdoctoral studies from Szeged University. During the last ten years she was working at the Institute of Arid Regions of Medenine, Tunisia, and had the opportunity to work in research teams in Spain, Portugal and Hungary. Dr. Thameur is an experienced scientist in various areas of plant biology and acquired particular skill in plant physiology, biochemistry, and biostatistics. She participated in many international conferences and was a panelist in scientific seminars. She has published more than 5 papers in reputed journals.