HEAT STRESS: Bread and Durum Wheat under Heat Stress: A Comparative Study on the Photosynthetic Performance

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Abstract

The photosynthetic responses to heat stress, during grain filling, in four genotypes of *Triticum aestivum* L. (Sever and Golia) and *Triticum turgidum* subsp. *durum* (Acalou and TE 9306), chosen according to its genetic background diversity, were investigated. All wheat genotypes (excepting Golia) showed synergistic trends implicating the internal CO_2 concentration, net photosynthesis and stomatal conductance. Additionally, the modifications of net photosynthesis were associated with changes in stomatal control. Chlorophyll *a* fluorescence parameters (minimal fluorescence, maximal and variable fluorescence, intrinsic efficiency of PSII in darkness, non-photochemical quenching, photochemical quenching and energy-dependent chlorophyll fluorescence quenching) further pointed heat protective mechanisms, implicating F_v/F_m stabilization (i.e. maintaining the efficiency of PS II) and electron transport rate preservation. It is concluded that, comparatively to bread wheat, the photosynthetic performance of durum wheat is more tolerant to heat stress, as stomatal conductance and transpiration are less affected.