

Wheat Cellular Membrane Thermotolerance Under Heat Stress

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Abstract

Four genotypes of *Triticum aestivum* L. and *Triticum turgidum* subsp. *durum* chosen according to their genetic background diversity were subjected to heat stress after anthesis. Membrane permeability, lipid peroxidation and fatty acids (C14:0, C16:0, C16:1c, C16:1f, C18:0, C18:1, C18:2 and C18:3) were quantified. The estimation of the quantum yield of non-cyclic photosynthetic electron transport was used as well as a test system to further evaluate the implications on thylakoid functioning. It was found differences within bread and durum wheat species concerning the capability to cope with high temperatures at the stage of grain filling. The genotype Sever showed high thermal sensitivity concerning membrane lipid peroxidation and membrane permeability, as evaluated by the increased production of ethylene and MDA, as well as by the impact on TFA (at the middle term of grain filling). In the durum wheat genotypes, differences were also found, with TE 9306 displaying high membrane stability, with no increases on membrane permeability, MDA and ethylene content. In this way, the observed changes on TFA in this genotype might have constituted a mechanism to allow qualitative lipid changes, reflected in lower unsaturation level of membrane FAs which is a positive trait under high temperatures.

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