

A Chlorophyll-Less Barley Mutant “*NYB*” Is Insensitive to Water Stress

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Z. Naturforsch. **62c**, 403–409 (2007); received December 29, 2006

“*NYB*” is a chlorophyll-less barley mutant, which grows relatively slow and unhealthily. The effects of water stress on photosystem II (PSII) of *NYB* and its wild type (WT) were investigated. Unexpected results indicated that the mutant was more resistant to water stress, because: PSII core proteins D1, D2 and LHCII declined more in WT than in *NYB* under water stress, and the corresponding *psbA*, *psbD* and *cab* mRNAs also decreased more dramatically in WT; CO₂ assimilation, stomatal conductance, maximum efficiency of PSII photochemistry (F_v/F_m), efficiency of excitation energy capture by open PSII reaction centres (F_v'/F_m'), quantum yield of PSII electron transport (Φ_{PSII}) and DCIP photoreduction in *NYB* were less sensitive to water stress than in WT, although the non-photochemical quenching coefficient (q_N) and the photochemical quenching coefficient (q_P) were almost the same in *NYB* and WT. Effective chlorophyll utilization and improved PSII protein formation in the mutant may be the reason for the enhanced stress resistance. Other possible mechanisms are also discussed.

Key words: Chlorophyll-Less Barley, Photosystem II, Water Stress