THE EFFECT OF NON-FUNCTIONAL MANGANESE ON SUBCELLULAR STRUCTURES FORMED IN DEVELOPING WHEAT PHOTOSYNTHETIC MEMBRANES AS OBSERVED BY NMR AND SORPTION ISOTHERM

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Several plant species reveal the tolerance to acute desiccation stress (eg. Antarctic lichens [3,4,5]). During rehydration process they can take water directly from gaseous phase in [2]. These facts focus the attention on the response of the isolated cell organellae to extreme environmental conditions. Photosynthetic membranes were selected by their importance for plant photosynthetic activity. It is not clear whether freeze-dried photosynthetic membranes remain in lamellar phase, however, after rehydration they return to lamellar phase [8,9].

The aim of this paper was to search the effect of non-functional loosely bound manganese pool on the membrane non-lamellar structures (presumably cylindrical tubulae [6,7]) formed in freeze-dried photosynthetic membrane.

The rehydration process, the nature of water binding sites, and water fractions bonded at initial stages of rehydration of photosynthetic membranes were examined using the hydration kinetics, the sorption isotherms and proton free induction decays for different hydration level.

Control photosynthetic membranes were grown in darkness for 6 days, then 24 hours in standarized light conditions, and subsequently freeze-dried. For all samples the sigmoidal form of adsorption isotherm was observed [1], with percentage of water binding sites with high affinity much lower than in lichen thalli [2]. NMR data were analyzed using FID decomposing procedure of CracSpin [10].

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