

PROTEOMIC ANALYSIS OF COLD STRESSED *ARABIDOPSIS THALIANA* CHLOROPLASTS

LUCAROTTI V., VITA F., ALPI A.

Department of Crop Plant Biology, University of Pisa, Via Mariscoglio 34, 56124 Pisa (Italy)

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Low temperature is one of the major abiotic stresses limiting the productivity and the geographical distribution of many species. The effect of cold acclimatization is evident at chloroplast level, for this reason our aim is to analyze the change in level of expression of chloroplast proteins during stress. 13-days old plants were acclimatized at 4°C for 1 week and treated at -10°C for 12 h and then recovered for 24 h. Freezing treatment produced stress phenotypes of rolling leaves, increase in electrolyte leakage and decrease in pigment content. The changes of total proteins in chloroplasts were examined using two-dimensional electrophoresis. Among 200 protein spots reproducibly detected on each gel, we found up- and down-regulated spots. Mass spectrometry analysis allowed the identification of 30 differentially expressed proteins, including well know cold-responsive proteins. Several proteins showed enhanced degradation during freezing stress, especially the photosynthetic proteins such as Rubisco activase (RcbA) and Rubisco large subunit (RcbL) of which 4 fragments were detected. The identified proteins are involved in several process: photosynthesis, RNA processing, protein translation and processing, metabolism of carbon, nitrogen end energy. These proteins might work cooperatively to reach an homeostatic equilibrium to overcome stress conditions.