Identification of the proteomic changes in suaeda aegyptiaca leaves under salt stress

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Soil salinity is a prevalent abiotic stress that limits the productivity and geographical distribution of many important crops worldwide. Suaeda aegyptiaca is a salt-tolerant plant (halophyte) that grows naturally in the salt-affected areas of a few provinces in China. The tolerance of Suaeda aegyptiaca for high-salinity environments makes it an ideal candidate for studying the molecular mechanisms of salinity stress. Different concentrations of sodium chloride, 0, 100, 200, 300 and 400 mM were used when Suaeda aegyptiaca seeds were germinating. Compared with other concentrations, 200 mM of sodium chloride could promote germination and growth. After 40 days of treatment, proteins of leaves were extracted and separated using two-dimensional polyacrylamide gel electrophoresis. A total of 602 visualized protein spots were repeatedly detected on the gel; among these proteins, 72 exhibited significant changes in abundance during three independent experiments. Through MALDI-TOF/TOF-MS, we identified 23 salt-responsive spots, and the abundance of 14 protein spots decreased while that of 9 protein spots increased. These proteins were involved in energy and material metabolism, protein synthesis and degradation, cell defense, and photosynthesis. All of the up-regulated proteins fell primarily into the category of defense and photosynthesis. In conclusion, our study uses proteomic analysis to provide new insight into responses to salt stress in Suaeda aegyptiaca.