Response of psammophyte *Alyssum desertorum* Stapf to soil flooding

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Growing on sands, *Alyssum desertorum* does not need adaptation to long-term waterlogging. To assess ability of this psammophyte to tolerate excessive moisture, we studied the response of plants to root flooding. Seeds collected from plants of the dry sandy areas of ravine forests in the Steppe Zone of the Dnipropetrovsk region, Ukraine. 3-week-old plants grown on sandy soil were subjected to soil flooding for 10 days. Heat shock protein HSP70 as a marker of stress reaction, alcohol dehydrogenase (ADH) as a key enzyme of anaerobic adaptation, photosynthetic pigment level, and ethylene as a phytohormone of hypoxic response and senescence were analyzed. Weak differential induction of two HSP70 isoforms (70 kDa and 73 kDa) simultaneously with the absence of significant changes in the total protein spectrum were determined, which indicates the role of chaperones in maintaining cellular proteostasis. At the same time, the rapid temporary activation of ADH synthesis in leaves during the first 2 days showed short-term systemic anaerobic metabolic adaptation to root hypoxia. On the other hand, the progressive increase in ethylene emission and decrease in pigment content were rather associated with induced plant senescence. The obtained data showed that this psammophyte has adaptive molecular mechanisms that enable it to survive short-term soil flooding.

Keywords: Alyssum desertorum; psammophyte; soil flooding; stress response