Micromorphology and silicon of the leaf epidermis in the psammophyte *Alyssum desertorum* are sensitive to soil flooding

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The ultrastructure of the leaf epidermis, localization, and content of silicon inclusions in the epidermal cells of the leaves of psammophyte *Alyssum desertorum* (Brassicaceae) seedlings grown in control and under 10-day soil flooding were studied by electron and laser confocal microscopy. The peculiarity of the structure of the adaxial and abaxial epidermis of the leaves of control samples was the presence of radially branched star-shaped trichomes with 5–6 rays. Trichomes, like the main cells of the epidermis, are covered with small waxy structures. The presence of silicon inclusions in trichomes and ordinary epidermal cells of the adaxial and abaxial surfaces of the leaves of control samples was established. The study of the effect of root flooding on the structure of *A. desertorum* leaves showed that flooding caused thickening of the anticlinal walls of the main epidermal cells on both leaf surfaces, an increase in the number and thickness of trichome branches, as well as an increase in the size and density of waxy structures on the surface of trichomes, stomata, and periclinal walls of epidermis. The flooding of plants also increased the silicon content in the periclinal walls of the abaxial surface and in the trichomes. Based on the results of our experiments and literature data, it can be concluded that under adverse conditions, trichomes, changing their structure, maintain the optimal thermal and water status of the waterlogged plants. The increased content of silicon inclusions contributes to the optimal absorption and reflection of sunlight, which leads to changes in the intensity of photosynthesis and thus helps to optimize the function of leaves in flooded plants.