

Effect of arsenic stress on physiological and morphological responses as well as selected chemical elements uptake of two ecotype of *Miscanthus*

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Abstract body text:

Arsenic (As) is one of the most toxic elements. The main source of As pollution for agricultural land and groundwater are the mining and metallurgical industries. The uptake of arsenic by crops disrupts many physiological processes, including photosynthesis. This further causes disturbances in the growth and formation of roots and leaves, and consequently plant dieback. Some plants, such as miscanthus, can play an important role in phytoremediation, i.e. cleaning up contaminated areas. The mechanisms of miscanthus tolerance to As are still unknown. It is assumed that the reduction of the harmful effect of As on the photosynthetic apparatus may result from the accumulation of this metalloid in plant organs like rhizomes or stems. The aim of the conducted research was to identify the morphological, physiological, and chemical aspects of this process. The influence of three arsenic forms: As (III) and As (V) and dimethylarsen (DMA) on the growth and physiology of rhizome seedlings of two *Miscanthus x giganteus* ecotypes ('Illinois' and 'Nagara') was tested. In the experiment, seedlings were watered once with solutions containing the above-mentioned forms of arsenic in concentrations: 10, 50, and 100 mg As · kg⁻¹ soil. Measurements and analyzes were performed immediately before, as well as 15 and 30 days after arsenic application, and were compared to control plants (not treated with As). The data were then subjected to statistical analysis in order to obtain the initial relationship between the processes occurring during the plant response to arsenic contamination.