



INVESTICE DO ROZVOJE VZDĚLÁVÁNÍ

CZ.1.07/2.3.00/30.0037

Zaměstnáním nejlepších mladých vědců k rozvoji mezinárodní spolupráce

ČESTNÉ PROHLÁŠENÍ

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Response of *Vicia faba* L. leaves to progressive drought stress: *In situ* temporal analysis using ratio imaging method

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Plants can sense progressive drought soon after soil water content (SWC) starts to decline. Precise nature of signal that provides information about water availability from roots to leaves and precise timing its transport is still unknown. The change in pH of leaf apoplast has been identified as an important marker of leaf response to drought stress of roots. We aimed at temporal analysis of changes in leaf apoplast pH of intact plant under progressive soil drying. We linked these changes with transpiration rate and other physiological traits as well as with SWC. An H⁺-sensitive fluorescence probe, in combination with ratio imaging microscopy, was used to measure leaf apoplastic pH in fully developed leaves of intact *V. faba* plants. We observed maximum change of 1.32 pH unit in leaf apoplast during drying period of 11 days and its gradual increase started in the leaves after 2 d of drought. These changes were greater in younger leaves of 0.40 pH unit than in older leaves. Leaf water potential significantly decreased after 4 d and transpiration rate was reduced after 5 d of drought. Early effect of drought on leaf growth was first observed after 6 d.