

Influence of cytoskeletal agents on the respiratory electron transport pathways in the cells of winter wheat leaves

Abdrakhimova Y., Khokhlova L., Abdrakhmanova A., Abdrakhimov F.
Kazan Federal University, 420008, Kremlevskaya 18, Kazan, Russia

Abstract

The effects of actin and tubulin polymerization inhibitors on the respiratory electron transport pathway activities were investigated using abscisic acid (ABA)- and cold-treated winter wheat seedling leaves. In unstressed control plants, cytochalasin B (15 μM) decreased the capacity of the cytochrome pathway, but stimulated the cyanide-resistant pathway, whereas oryzalin (15 μM) produced the opposite effects. Cold hardening (3°C for 7 days) and ABA treatment 30 μM changed the respiratory pattern in a similar manner to cytochalasin B but to lesser effects. This points to cold- and ABA-induced reduction in microfilament sensitivity to these drugs and hence stabilization of actin-dependent processes. In contrast, oryzalin had only weak effects on control samples and its effects were strengthened in the presence of the cytoskeleton-modifying factors. The data suggest that the potential targets for the agent either increase and/or the degree of involvement of microtubules in the respiratory chain regulation, and therefore that the cytoskeleton can modify the functioning of the respiratory electron transport pathways in winter wheat cells. (C) 2000 Academic Press.

<http://dx.doi.org/10.1006/cbir.1999.0522>

Keywords

Abscisic acid (ABA), Cold acclimation, Cytoskeleton, Respiratory electron transport pathways, *Triticum aestivum* L, Winter wheat