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Effect of abscisic acid and cold acclimation on the cytoskeletal and phosphorylated proteins in different cultivars of Triticum aestivum L.

Olinevich O., Khokhlova L., Raudaskoski M.

Kazan Federal University, 420008, Kremlevskaya 18, Kazan, Russia

Abstract

In winter wheat, the tubulin and 60 kDa-phosphorylated proteins/actin ratio is considerably higher in the roots than in the leaves. Differences in the content of the main cytoskeletal proteins were also found in the leaves of the different cultivars. It is suggested that the lower amount of the tubulin and 60 kDa-phosphorylated proteins and higher content of actin determine the greater tubulin cytoskeletal stability in the leaves and their higher frost resistance, as compared with the roots. Also, it is possible that the higher content of the tubulin and 60 kDa-phosphorylated proteins defines the lower microtubule (MT) stability in the leaves of the low frost resistant cultivar than in the leaves of the more frost resistant ones. In the roots and leaves of the low frost resistant cultivar, the low stability of the numerous tubulin structures is apparently one reason for the abscisic acid (ABA)-induced reduction of the cytoskeletal and 60 kDa-phosphorylated proteins in the cells. The cold acclimation compensated the ABA effect in the roots of the very frost resistant cultivar in the most extent. This suggests the existence of the different pathways in the increased plant cell frost resistance through the action of ABA and low temperature. (C) Academic Press.

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Keywords

Abscisic acid, Actin, Cold acclimation, Leaves, Phosphorylated proteins, Roots, Triticum aestivum L., Tubulin, Wheat cultivars