Occurrence and Characterization of a UDP-glucose:hydroxamic Acid Glucosyltransferase Isolated from Wheat (*Triticum aestivum*) Seedlings

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Z. Naturforsch. **55c**, 701–707 (2000); received May 6, 2000

Cyclic Hydroxamic Acid, Glucosyltransferase, Wheat (*Triticum aestivum*)

Cyclic hydroxamic acid glucosides are present at high concentrations immediately after germination in wheat (*Triticum aestivum* L.). Changes in the activity of UDP-Glucose:cyclic hydroxamic acid glucosyltransferase (EC 2.4.1.–) in wheat were investigated using the cyclic hydroxamic acids 2,4-dihydroxy-1,4-benzoxazin-3-one (DIBOA) and its 7-methoxy derivative (DIMBOA) as sugar acceptors. Glucosyltransferase activity on both substrates was detected in dry seeds, with activity increasing after imbibition, peaking in shoots and roots 36–48 hours after imbibition and decreasing thereafter. The transience of glucosyltransferase activity was concurrent with the transient occurrence of the hydroxamic acid glucosides [Nakagawa E., Amano T., Hirai N., and Iwamura H. (1995) *Phytochemistry* **38**, 1349–1354], suggesting that glucosyltransferases regulate the accumulation of hydroxamic acid glucosides in wheat seedlings. Two peaks in activity of UDP-Glucose:DIMBOA glucosyltransferase were detected using a Mono Q column, indicating the presence of at least two isozymes of this glucosyltransferase. The enzyme in the major peak was purified about 1500-fold and shown to be in a monomeric form with a molecular mass of 47 or 49 kDa. The enzyme reacted strongly with DIMBOA, less so with DIBOA. The enzyme of the minor peak on the Mono Q chromatogram, which was also a monomeric enzyme with a molecular mass of 47 kDa, showed similar substrate specificity to that of the major peak enzyme.