

Substrate specificity of a glucosyltransferase and an N-hydroxylase involved in the biosynthesis of cyclic hydroxamic acids in gramineae

Leighton, Victoria

Niemeyer, Hermann M.

Jonsson, Lisbeth M.V.

Microsomal preparations from maize seedlings exhibited N-hydroxylase activity with 2-hydroxy-1,4-benzoxazin-3-one (HBOA) as substrate, but not with its 7-methoxy analogue (HMBOA), or their corresponding 2-O- β -D-glucosides. Extracts of the hydroxamic acid (Hx)-accumulating species rye, wheat and *Hordeum lechleri*, showed UDP-glucose:Hx-glucosyltransferase activity. The hydroxamic acid, 2,4-dihydroxy-1,4-benzoxazin-3-one (DIBOA), and its 7-methoxy analogue, DIMBOA, were accepted as substrates, but not HBOA or HMBOA. The Hx-glucosyltransferase in the protein precipitate obtained between 30 and 60% ammonium sulphate saturation from either rye, wheat or *H. lechleri* had a higher V_{max} value and lower K_m value with DIMBOA as substrate. The Hx-glucosyltransferase from rye, which occurred in both roots and shoots throughout plant development, was purified 35-fold and characterized. The M_r of the enzyme was 43 000 and the isoelectric point 4.4. The K_m values for DIBOA and DIMBOA in the partly puri