

Purification and Characterization of a β -Glucosidase Specific for 2,4-Dihydroxy-7-methoxy-1,4-benzoxazin-3-one (DIMBOA) Glucoside in Maize

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Occurrence and properties of hydroxamic acid glucoside glucosidase were investigated in 10-day-old, autotrophic maize (*Zea mays* L.) in which 2,4-dihydroxy-7-methoxy-1,4-benzoxazin-3-one glucoside (DIMBOA-G) is a major benzoxazinone component. Crude extracts of both leaves and roots showed glucosidase activity for both DIMBOA-G and 2,4-dihydroxy-1,4-benzoxazin-3-one glucoside (DIBOA-G). A cation-exchange chromatography after cryoprecipitation of the extract from leaves gave a peak with both activities, and further purification by ion-exchange and hydroxyapatite chromatography gave a fraction with an apparent homogeneity, the purification being 560 fold. The K_m values (mM) of the purified glucosidase were 0.16 for DIMBOA-G, 0.68 for DIBOA-G and 2.96 for *p*-nitrophenyl- β -D-glucopyranoside. The activity on salicin and esculin was too low to be detected. The data indicate that a glucosidase specific for DIMBOA-G comes into contact with constitutive benzoxazinone glucosides producing defensive aglycone when plants are damaged by microbial or insect attacks.

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