

Dioscorin, the major tuber storage protein of yam (*Dioscorea batatas* Decne) with carbonic anhydrase and trypsin inhibitor activities.

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Abstract

Dioscorin, the tuber storage protein of yam (*Dioscorea batatas* Decne), was purified successively by ammonium sulfate fractionation, DE-52 ion exchange chromatography, and Sephadex G-75 column. Two protein bands (82 and 28 kDa) were found under nonreducing conditions after SDS-PAGE; but only one band (32 kDa) was detected under reducing conditions. The first 21 amino acids in the N-terminal region of the 28 kDa form were VEDEFSYIEGNPNPENWGNL, which was highly homologous to deductive sequence of dioscorin from cDNA of another yam species (*Dioscorea cayenensis* Lam) reported by Conlan et al. (Plant Mol. Biol. 1995, 28, 369-380). Hewett-Emmett and Tashian (Mol. Phylogenet. Evol. 1996, 5, 50 -77) mentioned that, according to DNA alignments, dioscorin from yam (*D. cayenensis*) was alpha-carbonic anhydrase (alpha-CA) related. In this report, we found that the purified dioscorin showed both CA dehydration activity using sodium bicarbonate as a substrate and CA activity staining after SDS-PAGE. A polyclonal antibody, which was raised against trypsin inhibitor (TI), a storage protein of sweet potato (*Ipomoea batatas* [L.] Lam var. Tainong 57), cross-reacted with dioscorin, which also showed TI activity determined by both activity staining after SDS-PAGE and trypsin inhibition determination.