

Both dioscorcin, the tuber storage protein of yam (*Dioscorea alata* cv. Taninong no. 1), and its peptic hydrolysates exhibited angiotensin converting enzyme inhibitory activities

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Abstract

Dioscorcin, the tuber storage protein of yam (*Dioscorea alata* cv. Tainong No. 1), was purified to homogeneity by DE-52 ion-exchange chromatography. This purified dioscorcin was shown by spectrophotometric methods to inhibit angiotensin converting enzyme (ACE) in a dose-dependent manner (12.5-750 microg, respectively, 20.83-62.5% inhibitions) using N-[3-(2-furyl)acryloyl]-Phe-Gly-Gly (FAPGG) as substrates. The 50% inhibition (IC(50)) of ACE activity was 6.404 microM dioscorcin (250 microg corresponding to 7.81 nmol) compared to that of 0.00781 microM (0.0095 nmol) for captopril. The commercial bovine serum albumin and casein (bovine milk) showed less ACE inhibitory activity. The use of qualitative TLC also showed dioscorcin as ACE inhibitors. Dioscorcin showed mixed noncompetitive inhibitions against ACE; when 31.25 microg of dioscorcin (0.8 microM) was added, the apparent inhibition constant ($K(i)$) was 2.738 microM. Pepsin was used for dioscorcin hydrolysis at 37 degrees C for different times. It was found that the ACE inhibitory activity was increased from 51.32% to about 75% during 32 h hydrolysis. The smaller peptides were increased with increasing pepsin hydrolytic times. Dioscorcin and its hydrolysates might be a potential for hypertension control when people consume yam tuber.