

Antioxidant activities of trypsin inhibitor, a 33 kDa root storage protein of sweet potato (*Ipomoea batatas* (L.)

Lam cv. Tainong 57)

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Abstract

Trypsin inhibitors (TIs), root storage proteins, were purified from sweet potato (*Ipomoea batatas*[L.] Lam cv. Tainong 57) roots by trypsin affinity column according to the methods of Hou and Lin (Plant Sci. 1997, 126, 11-19 and Plant Sci. 1997, 128, 151-158). A single band of 33 kDa TI was obtained by preparative sodium dodecyl sulfate-polyacrylamide gel electrophoresis (SDS-PAGE) gels. This purified 33 kDa TI had scavenging activity against 1,1-diphenyl-2-picrylhydrazyl (DPPH) radical. There was positive correlation between scavenging effects against DPPH (2 to 22%) and amounts of 33 kDa TI (1.92 to 46 pmol). The scavenging activities of 33 kDa TI against DPPH were calculated from linear regression to be about one-third of those of glutathione between 5 and 80 pmol. Using electron paramagnetic resonance (EPR) spectrometry for hydroxyl radical detection, it was found that 33 kDa TI could capture hydroxyl radical, and the intensities of EPR signal were significantly decreased from 1.5 to 6 pmol of 33 kDa TI compared to those of the controls. It is suggested that 33 kDa TI, one of the sweet potato root storage proteins, may play a role as an antioxidant in roots and may be beneficial to health when it is consumed.