

Title Anti-oxidative activity in lipophilic fraction of sweetpotato tubers
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Abstract

Physiological functions of hydrophilic polyphenolics such as caffeic acid, its derivatives, and anthocyanins in purple flesh varieties of sweet potato tuber have been studied extensively. With the exceptions of β -carotene and Vitamin E, however, only limited scientific investigation on the lipophilic components has been performed. In this study, the lipophilic antioxidative components in sweetpotato tubers were examined. Lipophilic components were extracted by acetone from 10 varieties of sweetpotato with white to yellow flesh. Antioxidative activities were examined by peroxy radical scavenging based on inhibition of 2,2'-azobis (2,4-dimethylvaleronitrile) (AMVN)-initiated peroxidation of methyl linoleate and 2,2'-azino-bis (3-ethylbenzothiazothiazoline-6-sulfonic acid) diammonium salt (ABTS) radical scavenging. The lipophilic fraction showed antioxidative activity with a correlation between peroxy radical scavenging activity and ABTS radical scavenging activity, but activity was not related to content of yellow pigment. To identify the components related to the antioxidative activity, the lipophilic fraction was analyzed by thin-layer chromatography and successive immersion in 1, 1-diphenyl-2-picrylhydrazyl (DPPH) solution (TLC-DPPH method). One band, other than yellow pigments, was detected that showed strong DPPH radical scavenging. Antioxidative components in the band were purified by preparative TLC and preparative HPLC using ODS column. Two antioxidative components were identified by means of H and EI-MS spectra as *p*-coumaric acid hexadecyl and *p*-coumaric acid octadecyl. The content of the *p*-coumaric acid esters were highly correlated to the antioxidative activity of lipophilic fraction. From these results, the main antioxidative components in lipophilic fraction of sweetpotato tubers are the novel *p*-coumaric acid esters with long alkyl chains, and these would act as anti-oxidants together with hydrophilic polyphenolics.