

Title Phenolic compounds and antioxidant capacity of commercial sweet potato cultivars
Author V.D. Truong, R.L. Thompson and R.F. McFeeters
Citation Book of Abstracts, 2004 IFT (Institute of Food Technologists) Annual Meeting and Food Expo, 13-16 July 2004, Las Vegas, Nevada, USA. 321 pages.
Keyword sweet potato; phenolic compound; antioxidant

Abstract

Recent literature indicates that phenolic compounds in various fruits and vegetables may play an important role in health-promoting functions and prevention of chronic diseases. Few studies of the phenolic components of sweet potatoes have been carried out. Information on these bioactive compounds will enhance the consumers' awareness of the nutritional value of sweet potatoes. Objectives of this study were to 1) determine the types and distribution of phenolic compounds in different tissues in the roots of the major U.S. commercial sweet potato cultivars and 2) measure the antioxidant activity of phenolic extracts. The outer layers (0.5 cm), including the skin and cortex of the roots were separated from the inner tissue. Samples were homogenized with 80% boiling ethanol and centrifuged. Supernatants were analyzed for total phenolics by the Folin-Ciocalteu method. Phenolic profiles were determined by UV-HPLC. Antioxidant activity (Trolox equivalent mg/g fresh weight) was evaluated against 2,2-diphenyl-1-picrylhydrazyl (DPPH) and 2,2'-azinobis (3-ethylbenzothiazoline-6-sulfonic acid) (ABTS) radicals. Total phenolic content ranged from 0.72-1.75 and 0.50-0.70 mg chlorogenic acid equivalent g⁻¹ fresh weight for outer layers and inner tissue, respectively. There were significant differences ($p>0.05$) among the cultivars. Caffeic acid, chlorogenic acid, and four isochlorogenic acid derivatives were the main phenolic components present. DPPH and ABTS antioxidant capacity of outer layers were 0.65-3.22 and 0.355-1.39, respectively, and 0.23-0.62 and 0.37-0.50 for the inner tissue. Total phenolics were highly correlated with DPPH ($r=0.94$) and ABTS ($r=0.98$) antioxidant capacity. Cultivars and tissue zones of sweet potato roots had different phenolic contents and antioxidant capacity. Appropriate cultivar selection and utilization of the whole roots in processed products would increase the availability of phenolic compounds from sweet potatoes.