Available online at www.sciencedirect.com
ScienceDirect
Food Chemistry 105 (2007) 57–64
Food Chemistry
www.elsevier.com/locate/foodchem

Antioxidant activity of *Kelussia odoratissima* Mozaff. in model and food systems

Fatemeh Ahmadi, Mahdi Kadivar *, Mohammad Shahedi

Department of Food Science and Technology, Isfahan University of Technology, Isfahan 84156, Iran

Received 27 October 2006; received in revised form 8 January 2007; accepted 15 March 2007

Abstract

Kelussia odoratissima Mozaff. is a sweet-smelling, self-growing plant which is traditionally consumed in Iran as a garnish. Little, however, is known about its potential antioxidant activity. In this study, the antioxidant activity of the methanolic extract of the plant was evaluated using β-carotene bleaching assay, reducing power, thiocyanate, accelerated oxidation of sunflower oil, and DPPH radical-scavenging. In DPPH and reducing power models the antioxidant activity of the plant extract was generally found to be less effective than that of ascorbic acid, but it was comparable to and/or greater than the activities of α-tocopherol and BHT. Although the antioxidant activity of BHT in β-carotene bleaching assay was greater than that of the sample, the difference was not significant ($\rho < 0.01$). Ascorbic acid showed low activity in this assay. The activity of the plant extract in the thiocyanate model system was lower than that of BHT but greater than that of α-tocopherol. The methanolic extract inhibited the oxidation of sunflower oil at 60 ± 3 °C more efficiently than did BHT.

Keywords: *Kelussia odoratissima*; Antioxidant activity; DPPH; β-Carotene bleaching; Reducing power; Thiocyanate; Sunflower oil

1. Introduction

Rancidity is considered as a serious problem in food products, reducing their shelf life and nutritional quality. Antioxidants can be effectively used to prevent lipid oxidation (Abdalla & Roozen, 1999). Antioxidants are defined as "substances that, when present in low concentrations compared to those of an oxidizable substrate, significantly delay or inhibit oxidation of that substrate" (Sikorski, 2001). However, some synthetic antioxidants, namely, butylated hydroxyanisole (BHA) and butylated hydroxytoluene (BHT), have been suspected to be responsible for liver damage and carcinogenesis in laboratory animals (Hwang, Shue, & Chang, 2001). Numerous types of natural antioxidants with various activities have been identified but a lot of attention has recently been drawn to the addition of polyphenols to foods and biological systems, due to their known abilities to scavenge free radicals (Kulisic, Radonic, Katalinic, & Milos, 2004; Pinelo, Rubilar, Sineiro, & Núñez, 2004). Phenolic compounds are among the most widely distributed plant secondary products and are found in many plants used as food and feed (Hagerman et al., 1998).

The antioxidant activity of phenolic compounds in plants is mainly due to their redox properties and chemical structure, which can play important roles in neutralizing free radicals, chelating transitional metals, and quenching singlet and triplet oxygen molecules through delocalizing or decomposing peroxides. These properties are linked to beneficial health functionality of phenolic antioxidants due to their inhibitory effects against development of many oxidative-stress related diseases, such as cardiovascular, inflammatory bowel syndrome and Alzheimer's disease. Increased intake of fruits and vegetables has also been associated with reduced risk of coronary heart disease (CHD), stroke, diabetes, cancer, cataracts, atherosclerosis,

* Corresponding author. Tel.: +98 311 3913382; fax: +98 311 3912254.
E-mail address: mak120@mail.usack.ca (M. Kadivar).

0308-8146/$ - see front matter © 2007 Elsevier Ltd. All rights reserved.
doi:10.1016/j.foodchem.2007.03.056