

Characterization of antioxidant compounds in Jaffa sweets and white grapefruits

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Received 23 October 2002; received in revised form 25 February 2003; accepted 25 February 2003

Abstract

Antioxidant compounds and the antioxidative activities of new Israeli citrus fruit sweetie [(Oroblanco, pummelo-grapefruit hybrid (*Citrus grandis* × *C. paradisi*))] were compared with the better-known white grapefruit. Total and free phenols were determined with the Folin–Ciocalteu reagent, phenolic acids (free, esters and glycosides) by HPLC analysis and anthocyanins spectrophotometrically. The antioxidant activities were estimated with two scavenging radicals: 2, 2′-azino-bis (3-ethylbenzothiazoline-6-sulfonate)- (ABTS) and nitric oxide (NO). Free radical scavenging properties of sweetie and grapefruit were evaluated by β -carotene bleaching (β -carotene). The results of kinetic reactions showed that both fruits differed in their capacities to quench these radicals and sweetie showed more antioxidative activity than grapefruit. Trans-hydroxycinnamic acids (caffeic, *p*-coumaric, ferulic, and sinapic) were more abundant in grapefruits than in sweeties. High correlation was observed between antioxidative activities and phenols ($R^2 = 0.94$). Both fruits have high concentrations of natural antioxidants with high antioxidative activities. Phenol content and the antioxidative potential are significantly higher in sweetie than in grapefruit. The higher antioxidant capacity of sweetie could make these new kinds of citrus fruits preferable for diets. In summary, the studied citrus fruit has high total phenolics and high antioxidant activities in vitro. Consumption of this fruit may contribute to an adequate intake of antioxidant phytochemicals.

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Keywords: Citrus fruits; Antioxidant compounds; Antioxidative activities

1. Introduction

It is well known that eating fruits and vegetables lowers the risk of chronic diseases, such as heart disease and cancer. The question of what are the active ingredients is still unresolved. The initial hypothesis was that antioxidant vitamins were responsible. However, more recently the polyphenols have been investigated since they have been found to be beneficial as strong anti-

oxidants (Vinson et al., 2002; Wang, Cao, & Prior, 1997). Recent studies are underline the importance of specific flavonoids as bioactive components of the diet in both in vivo and in vitro models. Thus, it is important to have a clear idea of the major phenolic families involved (Heller & Forkmann, 1988; Proteggente et al., 2002). It was shown that citrus fruits play a special role in decreasing the risk of ischemic stroke (Joshi et al., 1999). This positive influence was attributed to some natural antioxidant phytonutrients (Paganga, Miller & Rice-Evans, 1999; Proteggente et al., 2002). Flavonols, flavanols, anthocyanins, and phenylpropanoids might act as antioxidants or as agents of other mechanisms contributing to cardioprotective action (Vinson et al., 2002; Wang et

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