Antioxidant Activity and Phenolic Content of Sweet Cherries (*Prunus Avium L.*) from West and South-West of Romania

Sofia POPESCU1, Ariana-Bianca VELCIOV1, Adrian RIVIS1, Corina COSTESCU1, Cerasela PETOLESCU2

Banat’s University of Agricultural Sciences and Veterinary Medicine "King Michael I of Romania" Timisoara, 1Faculty of Food Processing Technology, 2Faculty of Horticulture and Forestry, 300645 Timisoara, Romania,

* Corresponding author e-mail: sofia.popescu@yahoo.com

Abstract

A diet rich in fruits and vegetables is associated with a lower incidence of degenerative diseases (such as cardiovascular disease and certain types of cancers). Currently, most research is focused on the content of polyphenols and antioxidant compounds found in fruit and vegetable. Sweet cherries (*Prunus avium L.*) contain a significant amount of polyphenols and several antioxidants that possess many biological activities such as anticancer, antioxidant and anti-inflammation properties.

In present study were investigated the quantification of total polyphenols and antioxidant capacity in fruits of a number of selected sweet cherry genotypes. Although sweet cherry fruits are a significant source of different phenolic compounds, antioxidant activity of sweet cherries is not related only with the total phenolic content.

Keywords: antioxidant activity, polyphenols, sweet cherry (*Prunus avium L.*)

Introduction. Sweet cherries are highly significant remedy-aliments (medicine-aliments) for the body, rich in antioxidants, which protect the cells against the negative effect of free radicals (Ferretti *et al.*, 2010; Dragan *et al.*, 2008). Sweet cherries are recommended both to people suffering from rheumatism, gout and constipation, and to those with kidney stones or gallstones (biliary stones) (Marcason, 2007). In terms of sweet cherries composition, the B-complex vitamins (B1, B2, B6, pantothenic acid) may be mentioned, as well as vitamins C and E, provitamin A, and minerals such as phosphorus, calcium, magnesium, potassium, iron (Malichacova *et al.*, 2010). Fruits and vegetables exert a protective effect against the development of human diseases such as cardiovascular disease, diabetes and cancer. Phenolic composition and antioxidant activity are genotype dependent and influenced by the climatic conditions (Faniadis *et al.*, 2008). The objectives of our work were to quantify the content of different phenolic compounds and the antioxidant activity of 12 sweet cherry cultivars at ripening time.

Materials and methods

Reagents and equipment: All chemicals and reagents were analytical grade or purest quality. Absorption determination for CUPRAC and total polyphenols content was made using SPECORD 205 spectrophotometer by Analytik Jena. Samples preparation: Fruits belonging to 12 varieties were included in this study. The samples were marked by the C letter (C1 – C12). Fruits of sweet cherry cultivars were collected in 2013 from different areas in Timiş, Gorj and Mehedinţi counties. Samples were prepared according to the method of Dragan *et al.* (2008). All samples were stored for 2 days at temperatures of 6°C and afterwards analyzed. Subsequently, they were chopped, weighed and processed in a 20% alcohol solution.
Polyphenols and other antioxidant compounds were extracted by using ethanol (20%). In the evaluation of the total antioxidant capacity (TAC) by CUPRAC method, we have used Trolox, as reference substance. The absorption was read after 1/2 hours at 20°C, at 450 nm. TAC by CUPRAC in sweet cherries was expressed as mmol Trolox/g fresh weight (FW). The content of total polyphenolic compounds in sweet cherries ethanol extracts was determined by Folin-Ciocalteu method (1927). The absorption was read after 2 h at 20°C, at 750 nm. TPC in fresh sweet cherries were expressed as gallic acid equivalents (GAE) per 100 g FW. All determinations were performed in triplicate.

Results and Discussion. Phenolics as secondary metabolites can, to a certain extent, contribute to sweet, bitter or astringent fruit flavours, while they can also contribute to aroma (Tomas-Barberan and Espin, 2001). The results for TAC by CUPRAC method and total polyphenols contents (TPC) are presented in figure1. The total polyphenolic contents of sweet cherry genotypes were in the range of 1.28-4.58 mmol GAE/100g sample. The highest TPC was identified for sweet cherry C1 variety followed by C3. The lower content in polyphenols was identified in the fruit belonging to the C9 variety. The highest TAC was detected in the C3 sweet cherry variety, followed by C1. Sweet cherry antioxidant capacity was higher in cultivars with dark fruit (Vangdal and Slimestad, 2006), which agrees with our results.

Sweet cherry fruits are a significant source of phenolic and antioxidant compounds, having beneficial properties for health. All the differences observed in the antioxidant capacity and polyphenols contents of sweet cherry varieties are related to genotype, but also to several factors such as ripening stage, cultivation practices (water availability, mineral nutrients), and climatic environment (mostly light and temperature).

References