BIOACTIVE COMPOUNDS AND ANTIOXIDANT PROPERTIES OF DRIED APRICOT

Jasna M. Čanadanović-Brunet*, Jelena J. Vulić, Gordana S. Četković, Sonja M. Djilas and Vesna T. Tumbas Šaponjac

University of Novi Sad, Faculty of Technology Novi Sad, Bulevar Cara Lazara 1, 21000 Novi Sad, Serbia

Dried apricot was extracted using two different solvents: 80% ethanol and hexane. The contents of total phenolics, flavonoids and anthocyanins were determined in ethanol apricot extract (EAE), while the carotenoid content was determined in hexane apricot extracts (HAE) by spectrophotometric method. The detected amounts of bioactive compounds in dried apricot were: phenolics 498.13 ± 12.04 mg GAE/100g DA, flavonoids 218.45 ± 14.14 mg R/100g DA and anthocyanins 3.08 ± 0.40 mg CGE/100g DA. In dried apricot the β-carotene was present in the amount of 0.56 ± 0.03 mg/100g DA. Some individual phenolic compounds in EAE were determined by HPLC analysis and the most dominant compound was gallic acid (35.02 ± 1.65 mg/100g DA). Free radical scavenging activities of EAE and HAE were tested spectrophotometrically using stable DPPH radicals and reducing power method. The EC50 value for EAE was 2.05 ± 0.06 mg/ml and for HAE was 6.28 ± 0.01 mg/ml. The RP0.5 values determined by reducing power method were 6.11 ± 0.01 mg/ml for EAE and 62.04 ± 0.03 mg/ml for HAE. The results indicate that dried apricot can be a valuable source of natural antioxidants and can be used as a functional food ingredient in the food industry.

KEY WORDS: dried apricot, phenols, carotenoids, DPPH antioxidant method, reducing power

INTRODUCTION

Fruits, fresh and dried form, are important constituents of our diet, and they are a rich source of antioxidants. Consumption of fruits rich in antioxidants has been reported to overcome some of the degenerative diseases that affect humans. The antioxidants that are naturally present in fruits include phenolic compounds (phenolic acids, flavonoids, lignins), vitamins (C and E) and carotenoids. Phenolics in particular are thought to act as anticarcinogenic, antimicrobial, antiallergic, antimutagenic and antiinflammatory, as well as they aid in reducing cardiovascular diseases. In addition, phenolics prevent the oxidation of LDL-lipoprotein, platelet aggregation, and damage of red blood cells (1). Phenols
and carotenoids have antioxidant properties and ability to alleviate chronic diseases (2-4). Antioxidants neutralise free radical reactive oxygen species that are generated endogenously through aerobic metabolism. Free radicals are potent genotoxins, causing mutations, DNA strand breakage, and oxidative damage to DNA, lipids and proteins both in vitro and in vivo (5, 6). Carotenoids are the most widespread group of pigments in nature. They are present in all photosynthetic organisms and are responsible for most of yellow to red colours of fruits and flowers (7).

Apricot (Prunus armeniaca L.) is classified under the Prunus species of the Prunoidea sub-family of the Rosacea family of the Rosales group (8). Apricot fruit contains 3 major types of antioxidant molecules: phenolics comprising both hydro- and lipophilic components, lipid-soluble carotenoids and water-soluble vitamin C, which contribute significantly to their taste, colour and nutritive values. β-carotene, which gives specific color to apricot, was found as the most abundant carotenoid. Besides β-carotene, apricot fruit and its products contain smaller amounts of α-carotene, γ-carotene, zeaxanthin and lutein (9).

Dried fruits represent a relatively concentrated form of fresh fruit, whereby moisture removal results in an increased shelf life. Dried fruits, as a consequence of concentration, have a higher total energy, nutrient density, fibre content, and often significantly greater antioxidant activity compared with fresh fruits (10). Apricots are processed on a basis of 40 – 45% of total world production (11). Drying is one of the commonly used technologies (12). Apricots can be dried in the sun, but there is an increasing request of sulphur free dried apricots, due to the allergic reactions that high concentrations of sulphites may cause in sensitive individuals. Also, the mechanical air dehydration has gained importance because it has many advantages over sun drying (13, 14), but hot air drying affects phenolic and lipophilic compounds, antioxidant capacity and redox potential. Dried apricot may be considered as a rich source of bioactive compounds, particularly of phenolics, carotenoids and vitamin C (15).

In this study we investigated the content of bioactive compounds (phenolics, flavonoids, and anthocyanins in the EAE and carotenoids in the HAE) by spectrophotometric method. Phenols composition in the EAE was determined by HPLC analysis. Antioxidant activities of EAE and HAE were evaluated on stable DPPH free radicals and by reducing power method. Synthetic antioxidant butylated hydroxyanisole (BHA) was used for comparison.

**EXPERIMENTAL**

**Chemicals**

DPHH, Folin–Ciocalteu reagent and BHA were purchased from Sigma Chemical Co. (St. Louis, MO, USA). These chemicals were of analytical reagent grade. All the standards were of HPLC grade and were purchased from Sigma Chemical Co. (St. Louis, MO, USA). The other chemicals and solvents used were of the highest analytical grade and were obtained from "Zorka" Šabac (Serbia).
Plant material

Dried apricots (*Prunus armeniaca* L.) were purchased from the local store (produced by Florida Bel d.o.o., Zemun, Serbia).

Extraction

Dried apricots were smashed in a blender Chop-Chop (Kaufmax DB 6210, Germany). The weighted samples of smashed dried apricots (30 g) were extracted at room temperature with two solvents of different polarity: 80% ethanol (two portions: 240 ml for 60 min and 120 ml for 30 min) and hexane (two portions: 240 ml for 60 min and 120 ml for 30 min). The obtained extracts were evaporated to dryness under reduced pressure. The yields of the EAE and HAE were 78.3 ± 2.05 % and 1.77 ± 0.06 %, respectively.

Total phenolic content

The amount of total phenolics (TPh) in dried apricot was determined in the EAE spectrophotometrically (UV-1800 Shimadzu spectrophotometer, Kyoto, Japan) according to the Folin-Ciocalteu method (16). The results were calculated using the calibration curve of gallic acid (GAE) and expressed as gallic acid equivalents (GAE) in mg per gram of dry extract (mg GAE/g DE) and per 100 g of dried apricot (mg GAE/100 g DA).

HPLC analysis of phenolic compounds

The individual phenolic compounds were analyzed in the EAE on a Shimadzu Prominence (Shimadzu, Kyoto, Japan) chromatographic system, which consisted of the LC-20AT binary pump, CTO-20A thermostat and SIL-20A autosampler connected to the Waters SPD-20AV UV/Vis detector (Shimadzu, Kyoto, Japan). Chromatograms were recorded using different wavelength for individual compounds: 280 nm for hydroxybenzoic acids (gallic, protocatechuic, vanillic and syringic acid) and ellagic acid, 320 nm for hydroxycinnamic acids (caffeic, chlorogenic, coumaric, ferulic, synapic and rosmarinic acid), and 360 nm for flavonoids (quercetin, rutin, luteolin, myricetin, kaempferol, catechin, epicatechin and epicatechin gallate). Separation was performed on a Luna C-18 RP column, 5 µm, 250 x 4.6 mm (Phenomenex, Torrance, CA, USA) with a C18 guard column, 4 x 30 mm (Phenomenex, Torrance, CA, USA). Two mobile phases, A (acetonitrile) and B (1% formic acid) were used at flow rates of 1 ml/min with the following gradient profile: 0 - 10 min from 10 to 25% A; 10 - 20 min linear rise up to 60% A, and from 20 min to 30 min linear rise up to 70% A, followed by 10 min reverse to initial 10% A with additional 5 min of equilibration time. Reference substances (flavonoids and phenolic acids) and samples were dissolved/extracted in 50% methanol. The data acquisition was carried out by the LC Solution Software (Shimadzu, Kyoto, Japan). The results were expressed as phenolic compounds in mg per 100 g of dry extract (mg/100 g DE) and per 100 g of dried apricot (mg/100 g DA).
Total flavonoid content

The amount of total flavonoids (TF) was determined in the EAE spectrophotometrically according to the Zhishen et al. (17). The flavonoids content was expressed as mg rutin equivalents (R) per g of dry extract (mg R/g DE) and per 100 g of dried apricot (mg R/100 g DA).

Total anthocyanins content

Total anthocyanins in dried apricot were estimated in the EAE spectrophotometrically using the pH single method (18). The extracts were diluted with two buffer solutions of the pH 1 and pH 4.5. The absorbance of each dilution was measured at 510 nm (A_{510}) and 700 nm (A_{700}) against a distilled water control. The total anthocyanins concentration was obtained from the equation:

$$C_{\text{tot}}(\text{mg/l}) = \frac{(A_{\text{tot}} \times \text{MW} \times \text{DF} \times 1000)}{\varepsilon \times L},$$

where $A_{\text{tot}}$ is calculated as $A_{\text{tot}} = A_{510} - A_{700}$, $\varepsilon$ is the molar absorbance coefficient of cyanidin-3-glucoside (26900 l/mol cm), MW is the molecular weight of cyanidin-3-glucoside (449.2 g/mol), DF is dilution factor and L is the cell path length (1 cm). Total anthocyanins content was expressed as mg of cyanidin-3-glucoside equivalents (CGE) per g of dried extract (mg CGE/g DE) and 100 g of dried apricot (mg CGE/100 g DA).

Carotenoids content

The content of carotenoids in dried apricot was analyzed in the HAE spectrophotometrically by the method of Nagata and Yamashita (19). The extract was diluted with acetone-hexane (4:6), then the absorbances were measured at 663 nm, 645 nm, 505 nm and 453 nm on a spectrophotometer (UV-1800 Shimadzu spectrophotometer, Kyoto, Japan). From these values, the content of $\beta$-carotene was estimated using the equation:

$$C_{\beta-\text{caroten}}(\text{mg/100ml}) = 0,216\times A_{663} - 1,22\times A_{645} - 0,305\times A_{505} + 0,452\times A_{453},$$

where $A_{663}$, $A_{645}$, $A_{505}$ and $A_{453}$ are the absorbance at 663 nm, 645 nm, 505 nm and 453 nm. The total $\beta$-carotene content was expressed as mg of $\beta$-carotene per g of dried extract (mg $\beta$-carotene /g DE) and 100 g of dried apricot (mg $\beta$-carotene/100 g DA).

Free radical assays

**DPPH free radical scavenging assay.** The DPPH radical scavenging activity (SA) of apricot extracts was determined spectrophotometrically using the modified DPPH method of Yen and Chen (20). The hydrogen atom or electron donation abilities of the extracts were measured based on the bleaching of a purple-colored methanol solution of the stable DPPH radical. Briefly, 1 ml of solution (water solution of EAE and hexane solution of HAE) was added to 2 ml of 90 $\mu$M DPPH solution (18 mg in 50 ml 95% methanol pre-
pared daily). The mixture was vortexed thoroughly for 1 min and left at room temperature for 30 min, then the absorbance was measured against a control at 517 nm (UV-1800 Shimadzu spectrophotometer, Kyoto, Japan). The range of investigated concentrations was 0.5 - 7.0 mg/ml. The capability to scavenge the DPPH radicals was calculated using the following equation:

\[ S_{\text{DPPH}} = \left( \frac{A_{\text{Control}} - A_{\text{Sample}}}{A_{\text{Control}}} \right) \times 100 \]

where \( A_{\text{Control}} \) is the absorbance of the blank and \( A_{\text{Sample}} \) is the absorbance in the presence of the extracts.

The EC\(_{50}\), defined as the concentration of the extract required for 50% scavenging of DPPH radicals under experimental condition employed, was used to measure the free radical SA (21). BHA was used as a control compound.

**Reducing power.** The reducing power of apricot extracts was determined by the method of Oyaizu (22). For this purpose, 1 ml of the solution (water solution of EAE and hexane solution of HAE) or 1 ml of distilled water (blank) was mixed with 1 ml of phosphate buffer (pH 6.6) and 1 ml of 1% potassium ferricyanide. The mixture was incubated at 50°C for 20 min and then rapidly cooled. Following this, 1 ml of trichloroacetic acid (10%) was added and the mixture was then centrifuged at 3000 rpm for 10 min. An aliquot (2 ml) of the upper layer, mixed with 2 ml of distilled water and 0.4 ml of 0.1% FeCl\(_3\), was left to dissolve for 10 min. The absorbance of the mixture was measured at 700 nm (UV-1800 Shimadzu spectrophotometer, Kyoto, Japan). The RP\(_{0.5}\), assigned at 0.5 value of the absorption, is used to define specific reduction capability. BHA was used as a control compound.

**Statistical analysis**

All measurements were carried out in triplicate and were presented as means ± SD. The calculations were performed using Microsoft Office Excel 2003.

**RESULTS AND DISCUSSION**

The results of the spectrophotometric determination of the contents of total phenolics, flavonoids, anthocyanins and carotenoids in dried apricot are shown in Table 1.

The phenolics content in dried apricot was 498.13 ± 12.04 mg GAE/100g DA. Comparing our results with those reported by Bennett et al. (23), the contents of phenolic compounds were higher in the present study. The higher phenolic contents can be explained by the fact that the Folin–Ciocalteu method is a rapid and widely-used assay to investigate the phenolic content. This method is based on reducing power of phenolic hydroxyl groups, but is known that different phenolic compounds have different responses to the Folin–Ciocalteu reagent (16). The flavonoid content in dried apricot reported by Hussain et al. (24) was 94.9 mg catechin (CE)/100g, while the results in Table 1 show a higher flavonoid content (218.45 ± 14.14 mg R/100g DA). The anthocyanins are present in small amounts in apricot (25). In our work, dried apricot contained 3.08 ± 0.40 mg CGE/100g DA, which is in accordance with the results reported by Bureau et al.
determined in apricot. The authors also reported that the skin of apricot possesses a higher anthocyanin content, which is in agreement with the data reported for fruits of cherry (26), plum (27, 28) or peach (27, 28, 29). Also, different conditions (year, location, climate) appear to influence the anthocyanin accumulation in apricot. In most species, the concentrations of fruit anthocyanin increase with ripening, as their biosynthesis proceeds faster than the fruit expansion.

Table 1. Contents of total phenolics, flavonoids, anthocyanins and carotenoids in dried apricot

<table>
<thead>
<tr>
<th>Chemical compounds</th>
<th>Contents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total phenolics</td>
<td>6.91 ± 0.17 mg GAE/g DE</td>
</tr>
<tr>
<td></td>
<td>498.13 ± 12.04 mg GAE/100g DA</td>
</tr>
<tr>
<td>Total flavonoids</td>
<td>3.03 ± 0.20 mg R/g DE</td>
</tr>
<tr>
<td></td>
<td>218.45 ± 14.14 mg R/100g DA</td>
</tr>
<tr>
<td>Total anthocyanins</td>
<td>0.04 ± 0.01 mg CGE/g DE</td>
</tr>
<tr>
<td></td>
<td>3.08 ± 0.40 mg CGE/100g DA</td>
</tr>
<tr>
<td>Total carotenoids</td>
<td>0.32 ± 0.02 mg β-caroten/g DE</td>
</tr>
<tr>
<td></td>
<td>0.56 ± 0.03 mg β-caroten/100g DA</td>
</tr>
</tbody>
</table>

The β-carotene was present in the amount of 0.56 ± 0.03 mg/100g DA (Table 1). The carotenoids content is lower than that reported for fresh apricot, which can be explained by the fact that drying may lead to degradation of carotenoids by the exposure to large amounts of oxygen and high drying temperatures.

Dragovic-Uzelac et al. (30) identified in apricot five carotenoids by HPLC method: α-carotene, β-carotene, γ-carotene, zeaxanthin, and lutein. From the immature stage to the commercial mature stage, the β-carotene amount in the cultivar grown in Baranja and Neretva valley increased from 176.7 g/100g and 203.1 g/100g to 1075 g/100g and 1376 g/100g. The carotenoid content was different among the cultivars studied and also among the geographical regions (30).

Phenolic acids (gallic, protocatechuic, vanillic, chlorogenic, caffeic, ferulic and cuminic) and flavonoids (catechin, epicatechin, rutin, myricetin and quercetin) were identified and quantified in dried apricot (Table 2).

The most abundant phenolic compound in dried apricot was gallic acid (44.71 ± 1.89 mg/100g DE; 35.02 ± 1.65 mg/100g DA). Madrau et al. (31) reported the results of the HPLC analysis for two dried apricot varieties (Pelese and Cafona). They did not detect gallic acid, but the most common compounds were rutin (Pelese 67.59 mg/kg DM; Cafona 167.20 mg/kg DM), neochlorogenic acid (Pelese 29.94 mg/kg DM; Cafona 267.39 mg/kg DM) and catechin (Pelese mg/kg DM; Cafona mg/kg DM). In our study, dried apricot had also a high content of flavonoid rutin (29.35 ± 1.26 mg/100g DE; 22.99 ± 1.12 mg/100g DA) and protocatechuic acid (16.15 ± 0.75 mg/100g DE; 12.64 ± 0.53 mg/100g DA). Other compounds found in Pelese and Cafona dried apricots were chlorogenic acid, epicatechin and quercetin 3-O-glucoside. In dried apricot origin from our lo-
cality, epicatechin, vanillic, chlorogenic and caffeic acid were detected in significant amounts. The difference in the reported results could be due to the environmental conditions, period of harvesting, cultivar variability, or fruit maturity (32).

Table 2. Phenols composition in dried apricot

<table>
<thead>
<tr>
<th>Phenolic compound</th>
<th>mg/100g DE</th>
<th>mg/100g DA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gallic acid</td>
<td>44.71 ± 1.89</td>
<td>35.02 ± 1.65</td>
</tr>
<tr>
<td>Protocatechuic acid</td>
<td>16.15 ± 0.75</td>
<td>12.64 ± 0.53</td>
</tr>
<tr>
<td>Catechin</td>
<td>3.59 ± 0.15</td>
<td>2.81 ± 0.13</td>
</tr>
<tr>
<td>Epicatechin</td>
<td>5.98 ± 0.26</td>
<td>4.69 ± 0.19</td>
</tr>
<tr>
<td>Vanillic acid</td>
<td>4.87 ± 0.21</td>
<td>3.81 ± 0.17</td>
</tr>
<tr>
<td>Chlorogenic acid</td>
<td>3.79 ± 0.16</td>
<td>2.97 ± 0.12</td>
</tr>
<tr>
<td>Caffeic acid</td>
<td>4.57 ± 0.18</td>
<td>0.36 ± 0.02</td>
</tr>
<tr>
<td>Ferulic acid</td>
<td>0.41 ± 0.02</td>
<td>0.32 ± 0.01</td>
</tr>
<tr>
<td>Cumaric acid</td>
<td>0.36 ± 0.02</td>
<td>0.28 ± 0.01</td>
</tr>
<tr>
<td>Rutin</td>
<td>29.35 ± 1.26</td>
<td>22.99 ± 1.12</td>
</tr>
<tr>
<td>Myricetin</td>
<td>0.82 ± 0.03</td>
<td>0.64 ± 0.02</td>
</tr>
<tr>
<td>Quercetin</td>
<td>1.02 ± 0.04</td>
<td>0.80 ± 0.03</td>
</tr>
</tbody>
</table>

Data presented as means ± SD

Antiradical assays

Antioxidant activities of dried apricot were determined using EAE and HAE. The free radical scavenging activities of dried apricot extracts and BHA were determined by the DPPH radical assay and reducing power (Table 3).

Table 3. EC50 values of EAE, HAE and control

<table>
<thead>
<tr>
<th>Dried apricot extracts and control</th>
<th>EC50 (mg/ml)</th>
<th>RP0.5 (mg/ml)</th>
</tr>
</thead>
<tbody>
<tr>
<td>EAE</td>
<td>2.05 ± 0.06</td>
<td>6.11 ± 0.01</td>
</tr>
<tr>
<td>HAE</td>
<td>6.28 ± 0.11</td>
<td>62.04 ± 0.03</td>
</tr>
<tr>
<td>BHA</td>
<td>0.003 ± 0.002</td>
<td>0.03 ± 0.01</td>
</tr>
</tbody>
</table>

The antioxidant molecules can quench DPPH free radicals (i.e. by providing hydrogen atoms or by electron donation, conceivably via a free-radical attack on the DPPH molecule) and convert them to a colorless/bleached product (i.e. 2,2-Diphenyl-1-hydrazine, or a substituted analogous hydrazine), resulting in a decrease in the absorbance at 517 nm (33). Figure 1 shows the dose response for the DPPH radical scavenging activity of EAE and HAE. The DPPH free radical scavenging activity of the extracts increased with the increasing concentration. The EC50 values of apricot extracts and BHA are shown in Table 3.
Hussain et al. (24) reported that the EC$_{50}$ value for methanol dried apricot extract determined by DPPH assay was 0.21 mg/ml. Our results reported in Table 3 are in accordance with the reported results.

Figure 2 and Figure 3 show the reducing power of the EAE and HAE, respectively.
Figure 3. Reducing power of the HAE

Different studies have indicated that the electron donation capacity, reflecting the reducing power, of bioactive compounds is associated with antiradical activity (34, 35). The presence of reductants such as antioxidant substances causes the reduction of the ferric – ferricyanide complex to the ferrous – ferricyanide complex of Perl’s Prussian blue. Therefore, Fe$^{2+}$ can be monitored by measuring the absorbance at 700 nm (36). In this assay, the yellow colour of the test solution changes to various shades of green and blue, depending on the reducing power of the antioxidant substances in the extracts. The reducing power of the apricot extract may serve as a significant indicator of its potential antiradical activity. The reducing power of apricot extracts increased with increase with the concentration. Different concentrations of EAE (0.50 – 10.00 mg/ml) and HAE (20.00 – 100.00 mg/ml) demonstrated different reducing ability. The RP$_{0.5}$ values of reducing power of dried apricot extracts and BHA are shown in Table 3. The EAE showed a higher reducing power than HAE. The results obtained for the reducing power demonstrate the electron donor properties of dried apricot extracts, thereby neutralizing free radicals by forming stable products. The outcome of the reducing reaction is to terminate the radical chain reactions that may otherwise be very damaging.

The EAE showed a higher antioxidant activity than HAE in both antiradical tests (DPPH assay and reducing power). The presented results indicate that phenolic compounds present in dried apricot have a higher effect on the antioxidant activity than carotenoids, but potentially these bioactive compounds act synergistically. It is hypothesized that the additive and synergistic effects of the phytochemicals in fruits and vegetables are responsible for their potent antioxidative and anticancer activities and that the benefits of this diet are attributed to the complex mixture of phytochemicals present in whole foods (37).
CONCLUSION

The contents of total phenolics (498.13 ± 12.04 mg GAE/100g DA), flavonoids (218.45 ± 14.14 mg R/100g DA), anthocyanins (3.08 ± 0.40 mg CGE/100g DA) and carotenoids (0.56 ± 0.03 mg/100g DA) were determined in dried apricot. HPLC analysis showed that the most abundant phenol was gallic acid (35.02 ± 1.65 mg/100g DA). The EAE showed better free radical scavenging activity towards stable DPPH radicals and reducing power than HAE. EC50 values in DPPH assay for EAE was 2.05 ± 0.06 mg/ml, while this value for HAE was 6.28 ± 0.01 mg/ml. R0.5 values determined in reducing power method were 6.11 ± 0.01 mg/ml for EAE, and 62.04 ± 0.03 mg/ml for HAE. The HAE showed free radical scavenging activity towards stable DPPH radicals (6.28 ± 0.11 mg/ml) and reducing power (62.04 ± 0.03 mg/ml). Based on the results presented here, we suggest that dried apricots can be used as natural source of bioactive compounds and as a functional food ingredient with long shelf life in food industry.

Acknowledgements

This study is part of the Project No. 114-451-3512/2013-02 which is financially supported by the Provincial Secretariat for Science and Technological Development of the Autonomous Province of Vojvodina, Republic of Serbia.

REFERENCES


БИОАКТИВНЕ КОМПОНЕНТЕ И АНТИОКСИДАТИВНЕ КАРАКТЕРИСТИКЕ СУВЕ КАЈСИЈЕ

Јасна М. Чападановић-Брунет, Јелена Џ. Вулић, Гордана С. Ћетковић, Соња М. Ћилас и Весна Т. Тумбас Шапоњац

Универзитет у Новом Саду, Технологски факултет, Булевар Цара Лазара 1, 21000 Нови Сад, Србија

У овом раду урађена је екстракција суве кајсије са два различита растварача: 80% етанолом и хексаном. Садржај укупних фенола, флавоноида и антоцијана испитан је у етанолном екстракту суве кајсије (ЕАЕ), док је садржај каротеноида испитан у хексанском екстракту суве кајсије (НАЕ) спектрофотометријским мето-
дама. Одређена количина биоактивних једињења у сувој кајсији је: феноли 498,13 ± 12,04 mg GAE/100g DA, flavonoиди 218,45 ± 14,14 mg R/100g DA и антоцијани 3,08 ± 0,40 mg CGE/100g DA. У сувој кајсији β-каротен је био присутан у количини од 0,56 ±0,03 mg/100g DA. Фенолне компоненте су одређене HPLC анализом ЕАЕ, а доминанта је била гална киселина (35,02 ± 1,65 mg/100g DA). Антирадикалска активност ЕАЕ и НАЕ утврђена је спектрофотометријским тестом на DPPH радикале и методом редукционе способности. EC50 вредности ЕАЕ износиле су 2,05 ± 0,06 mg/ml, а НАЕ 6,28 ± 0,11 mg/ml. RP0.5 вредности одређене методом редукционе способности износиле су 6,11 ± 0,01 mg/ml за ЕАЕ и 62,04 ± 0,03 mg/ml за НАЕ. Резултати овог истраживања указују да је сува кајсија значајан извор природних антиоксиданата и на могућност њеног коришћења као функционалне хране у исхрани и прехрambеној индустрији.

Кључне речи: суша кајсија, феноли, каротеноиди, DPPH антиоксидативна метода, редукциона способност