

Bioactive compounds and antioxidant activity of Nespereira-Das-Rochas (*Amelanchier ovalis* Medik.)

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Amelanchier ovalis Medik. subsp. *ovalis*
ocorrências em Portugal
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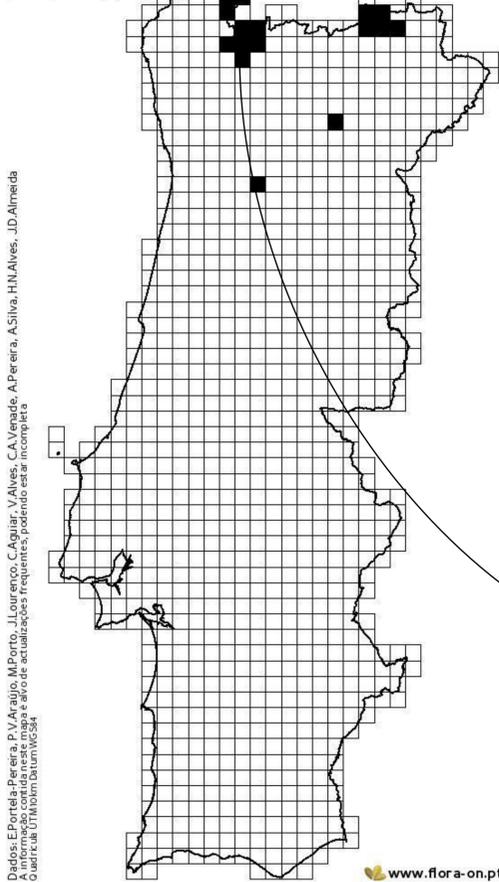


Figure 1. Localization of *Amelanchier ovalis*.

INTRODUCTION

In recent years, special attention has been given to the characterization of several wild berries due to their high contents of polyphenolic compounds which seem to be the main responsible for the recognized antioxidant properties of the berries [1, 2]. These beneficial effects on human health are one of the reasons for the consumer's high demand for these berries. Even though some wild species have already been highly studied, *Amelanchier ovalis* lacks detailed characterization.

A. ovalis, commonly known as Nespereira-Das-Rochas is a relatively rare species in Portugal, found mainly in the Northwest (Minho) and Northeast (Trás-os-Montes) regions (Figure 1). It is a small and thin shrub with reddish-grey bark, normally not exceeding 3-4 meters in height. It usually produces a multiple or single trunk, but branches very quickly into secondary trunks. It has an erect, open and irregular crown that in spring is covered with white flowers and in late summer with bluish-black fruits (Figure 2). During the autumn the leaves acquire shades of yellow, orange and red.

In order to identify the phytochemical compounds of this species the present study aimed to quantify the bioactive compounds and determine the antioxidant activity of *A. ovalis* berries.



Figure 2. *Amelanchier ovalis*.

MATERIAL AND METHODS

Around 250 berries were randomly collected from different *A. ovalis* trees in Terras de Bouro (Braga district) in August 2020. The berries were then freeze-dried and crushed.

Methanolic extract (70 % v/v) were obtained by ultrasound extraction and used for the quantification of bioactive compounds. The Folin-Ciocalteu's method was used for the determination of total phenols and tannins. Tannins were quantified by the difference in total phenolics before and after treatment with insoluble polyvinylpyrrolidone (PVPP). Total anthocyanins were determined by the pH differential method. A colorimetric method with aluminum chloride was used for the determination of flavonoids. The 2,2-diphenyl-1-picrylhydrazyl (DPPH) test was used to assess the antioxidant activity of extracts.

RESULTS AND DISCUSSION

As shown in Table 1 the content of total phenolic compounds in the extract was $15,54 \pm 0,32$ mg GAE/g sample. The extracts contain $2,08 \pm 0,02$ mg QE/g sample of total flavonoids and $1,82 \pm 0,04$ mg Cia-3-Glu/g sample of anthocyanins. The concentration of total tannins accounted for $14,18$ mg GAE/g of the sample (Table 1).

The extract shows that *A. ovalis* berries have a good ability to scavenge free radicals by the DPPH method with an IC_{50} of $5,27 \pm 0,27$ mg/ml (Table 2).

Table 1. Total phenolic compounds, flavonoids, anthocyanins and tannins contents present in methanolic extract (70 % v/v) of *A. ovalis* berries (mean \pm SD).

| Extract | Total phenolic (mg GAE/g dry matter) | Total flavonoids (mg of QE/g dry matter) | Total anthocyanins (mg Cia-3-Glu/100g dry matter) | Tannin content (mg GAE/g dry matter) |
|------------------|---|---|--|---|
| <i>A. ovalis</i> | $15,54 \pm 0,32$ | $2,08 \pm 0,02$ | $1,82 \pm 0,04$ | $14,18 \pm 0,29$ |

Table 2. Antioxidant activity of methanolic extract (70 % v/v) of *A. ovalis* berries (mean \pm SD).

| Extract | IC_{50} (mg/ml) |
|------------------|-------------------|
| <i>A. ovalis</i> | $5,27 \pm 0,27$ |

CONCLUSION

This preliminary study shows that *A. ovalis* berries seem to be a good source of bioactive compounds that now need a more detailed characterization and a better understanding of their potential for use in beneficial health products.

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