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## INTRODUCTION

Interest in wild species has gradually increased due to its rich nutritional composition and bioactive compounds of interest, fundamental for the proper functioning of the organism. This diversity of compounds, in addition to being beneficial at food level, establishes advantages for future applications in various industrial sectors, particularly food, pharmaceutical and cosmetic. In fact, wild species are the large reservoir of plants with potential for the most varied uses, have been used since antiquity as a source of food, cosmetic products, and medicines. The species *Rubus ulmifolius* Schott is known for its fruits - the wild blackberry. The berries are eaten fresh or as products derived by their delicious flavor. In Portugal, there are more than a dozen species of blackberries (Reidel et al., 2016). It is a wild resource to be explored in Portugal. In the past, they served various purposes, from the construction of fences to the use of fruits and for medicinal purposes). The parts used in the plant are the bud flowers, the leaves (before flowering), the turions and the fruits. The potential value of *Rubus* species is high, increasing consumer interest in the search for these healthier fruits (Valdivieso et al., 2018). *Rubus* fruits have been highlighted as an important source of bioactive constituents and health promoters, nevertheless little information on its composition is available (Reidel et al., 2016; Barros et al., 2010; Oszmiański et al., 2015).

This work aims to contribute to the valorization of the natural heritage, wild fruits of Alto Minho region, in the Northern of Portugal, and raise awareness of the need for preservation of endogenous species. In the present study, the phytochemical characterization and antioxidant activity evaluation were carried out.



Figure 1. Descriptive aspects of wild blackberry.

## MATERIAL AND METHODS

The blackberry (*Rubus ulmifolius* Schott) was collected according to the availability of the fruits over several and several days, in the municipality of Caminha (Viana do Castelo district, NW Portugal) and 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 measured as the difference in total phenolics before and after treatment with insoluble polyvinylpolypyrrolidone (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. All chemical analyses were performed in triplicate. Statistical analysis was performed using IBM SPSS statistics 22 software.

## RESULTS AND DISCUSSION

The results presented in Table 1 show that the content of total phenolic compounds in the extract was 3376,5 ± 212,8 mg GAE/100 g sample. The extracts contain 242,8 ± 34,4 mg QE/100 g sample of total flavonoids and 49,9 ± 1,2 mg Cia-3-Glu/100 g sample of anthocyanins. The concentration of total tannins accounted for 3143,4 ± 173,4 mg GAE/100 g of the sample (Table 1).

The extract shows that *R. ulmifolius* berries have a good ability to scavenge free radicals by the DPPH method with an IC<sub>50</sub> of 2,2 ± 0,3 mg/ml (Table 2).

Table 1. Total phenolic compounds, flavonoids, anthocyanins and tannins contents present in methanolic extract of *R. ulmifolius* berries (mean ± SD).

Extract	Total phenolic (mg GAE/100 g dry matter)	Total flavonoids (mg of QE/100 g dry matter)	Total anthocyanins (mg Cia-3-Glu/100 g dry matter)	Tannin content (mg GAE/100 g dry matter)
<i>R. ulmifolius</i>	3376,5 ± 212,8	242,8 ± 34,4	49,9 ± 1,2	3143,4 ± 173,4

Table 2. Antioxidant activity of methanolic extract of extract of *R. ulmifolius* berries (mean ± SD).

Extract	IC <sub>50</sub> (mg/ml)
<i>R. ulmifolius</i>	2,2 ± 0,3

## CONCLUSION

*Rubus ulmifolius* Schott wild berries have an enormous potential for valorization not only for its nutritional value but also for its wealth of bioactive compounds.

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