

Effect of Harvesting Year and Elderberry Cultivar on the Chemical Composition and Potential Bioactivity: A Three-Year Study

[Sandrine S Ferreira](#)¹, [Pedro Silva](#)², [Amélia M Silva](#)³, [Fernando M Nunes](#)⁴

Affiliations

- PMID: **31442705**
- DOI: [10.1016/j.foodchem.2019.125366](https://doi.org/10.1016/j.foodchem.2019.125366)

Abstract

Sambucus nigra is one of the richest sources of anthocyanins and other polyphenols being used industrially as a source of antioxidants, colorants, and bioactives. Although cultivars can influence elderberry composition, no study has addressed the effect of harvesting year on elderberries composition and bioactivity. The composition of the main Portuguese cultivars, "Sabugueiro", "Sabugueira" and "Bastardeira", were evaluated during three consecutive years. Harvesting year had a stronger influence on the chemical composition than cultivars, including total sugars, anthocyanins, and phenolic compounds, being related to the different climatic conditions, especially water status. "Bastardeira" was the best cultivar concerning total soluble solids, anthocyanins, polyphenols, and antioxidant activity, but containing a lower total free sugar content compared to "Sabugueiro". The results obtained in this study provide novel information from a nutritional perspective and for breeding programs aiming to select cultivars with enhanced levels of health-promoting compounds or for other industrial applications of elderberries.

Keywords: Anthocyanins; Antioxidant activity; Elderberry; Organic acids; Polyphenols; *Sambucus nigra*; Sugars; Tyrosinase inhibitor.

Copyright © 2019 Elsevier Ltd. All rights reserved.

Similar articles

- [Polyphenols pattern and correlation with antioxidant activities of berries extracts from four different populations of Sicilian *Sambucus nigra* L.](#) Mandrone M, Lorenzi B, Maggio A, La Mantia T, Scordino M, Bruno M, Poli F. Nat Prod Res. 2014;28(16): 1246-53. doi: 10.1080/14786419.2014.898147. Epub 2014 Mar 25. PMID: 24666289
- [Polyphenolic content, antiradical activity, stability and microbiological quality of elderberry \(*Sambucus nigra* L.\) extracts.](#) Pliszka B. Acta Sci Pol Technol Aliment. 2017

Oct-Dec;16(4):393-401. doi: 10.17306/J.AFS.0523. PMID: 29241318

- [Fruit Phenolic Composition of Different Elderberry Species and Hybrids.](#) Mikulic-Petkovsek M, Ivancic A, Todorovic B, Veberic R, Stampar F. J Food Sci. 2015 Oct; 80(10):C2180-90. doi: 10.1111/1750-3841.13008. Epub 2015 Sep 26. PMID: 26409176
- [Investigation of anthocyanin profile of four elderberry species and interspecific hybrids.](#) Mikulic-Petkovsek M, Schmitzer V, Slatnar A, Todorovic B, Veberic R, Stampar F, Ivancic A. J Agric Food Chem. 2014 Jun 18;62(24):5573-80. doi: 10.1021/jf5011947. Epub 2014 May 28. PMID: 24830391
- [The Efficacy of Administering Fruit-Derived Polyphenols to Improve Health Biomarkers, Exercise Performance and Related Physiological Responses.](#) Kashi DS, Shabir A, Da Boit M, Bailey SJ, Higgins MF. Nutrients. 2019 Oct 7;11(10):2389. doi: 10.3390/nu11102389. PMID: 31591287 Free PMC article. Review.
- [Effect-directed analysis of fresh and dried elderberry \(*Sambucus nigra* L.\) via hyphenated planar chromatography.](#) Krüger S, Mirgos M, Morlock GE. J Chromatogr A. 2015 Dec 24;1426:209-19. doi: 10.1016/j.chroma.2015.11.021. Epub 2015 Nov 12. PMID: 26643726
- [Effects of short-term heating on total polyphenols, anthocyanins, antioxidant activity and lectins of different parts of dwarf elder \(*Sambucus ebulus* L.\).](#) Jimenez P, Cabrero P, Basterrechea JE, Tejero J, Cordoba-Diaz D, Cordoba-Diaz M, Girbes T. Plant Foods Hum Nutr. 2014 Jun;69(2):168-74. doi: 10.1007/s11130-014-0417-x. PMID: 24793353
- [Anthocyanin Profile of Elderberry Juice: A Natural-Based Bioactive Colouring Ingredient with Potential Food Application.](#) da Silva RFR, Barreira JCM, Heleno SA, Barros L, Calhella RC, Ferreira ICFR. Molecules. 2019 Jun 26;24(13):2359. doi: 10.3390/molecules24132359. PMID: 31247974 Free PMC article.
- [The kinetics of thermal degradation of polyphenolic compounds from elderberry \(*Sambucus nigra* L.\) extract.](#) Oancea AM, Onofrei C, Turturică M, Bahrim G, Râpeanu G, Stănciuc N. Food Sci Technol Int. 2018 Jun;24(4):361-369. doi: 10.1177/1082013218756139. Epub 2018 Feb 6. PMID: 29409346
- [Elderberry \(*Sambucus nigra* L.\) wine: a product rich in health promoting compounds.](#) Schmitzer V, Veberic R, Slatnar A, Stampar F. J Agric Food Chem. 2010 Sep 22;58(18):10143-6. doi: 10.1021/jf102083s. PMID: 20735034

[See all similar articles](#)

Cited by 1 article

- [The Content of Selected Minerals, Bioactive Compounds, and the Antioxidant Properties of the Flowers and Fruit of Selected Cultivars and Wildly Growing Plants of *Sambucus nigra* L.](#) Młynarczyk K, Walkowiak-Tomczak D, Staniek H, Kidoń M, Łysiak GP. *Molecules*. 2020 Feb 17;25(4):876. doi: 10.3390/molecules25040876. PMID: 32079214
Free PMC article.