

Assessment of total phenolic content and antioxidant activity of Staghorn sumac (*Rhus typhina* L.)

Asta Špadienė^{1*}

¹Department of Drug Chemistry, Lithuanian University of Health Sciences, Kaunas, Lithuania

*Corresponding author e-mail: Asta.Spadiene@lsmu.lt

Introduction

Staghorn sumac is widely cultivated in the temperate regions. Sumac fruits are rich in organic acids, hydrolysable tannins, phenolic acids, and flavonoids [1]. Staghorn sumac also contains other nutrients such as essential amino acids, unsaturated fatty acids, minerals and vitamins. However, the chemical composition of staghorn sumac is much influenced by genetic and environmental factors, plant parts, and extraction and quantification methods [2]. Therefore, the aim of this study was to determine and compare total phenolic content and evaluate antioxidant activity of different parts of staghorn sumac.

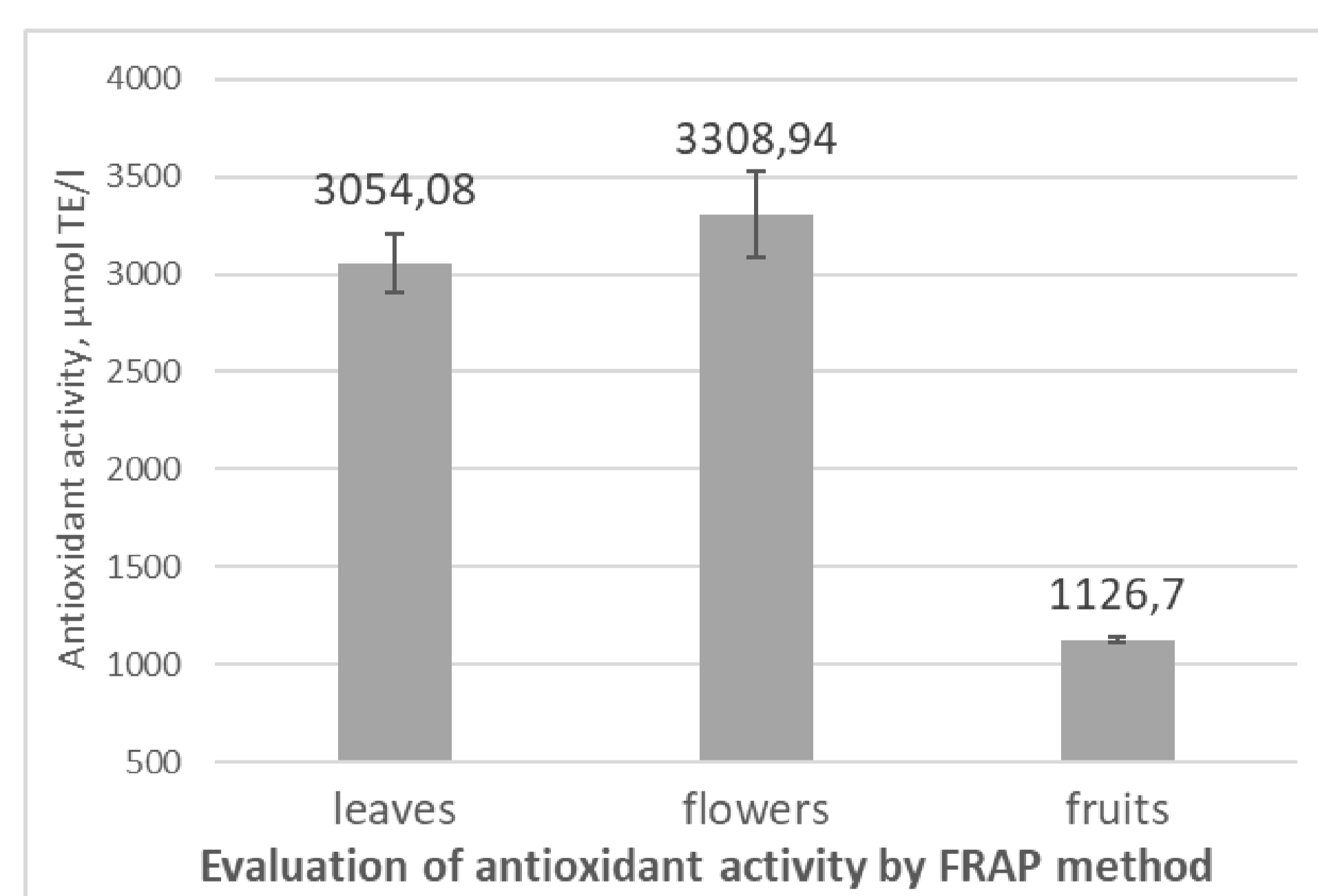
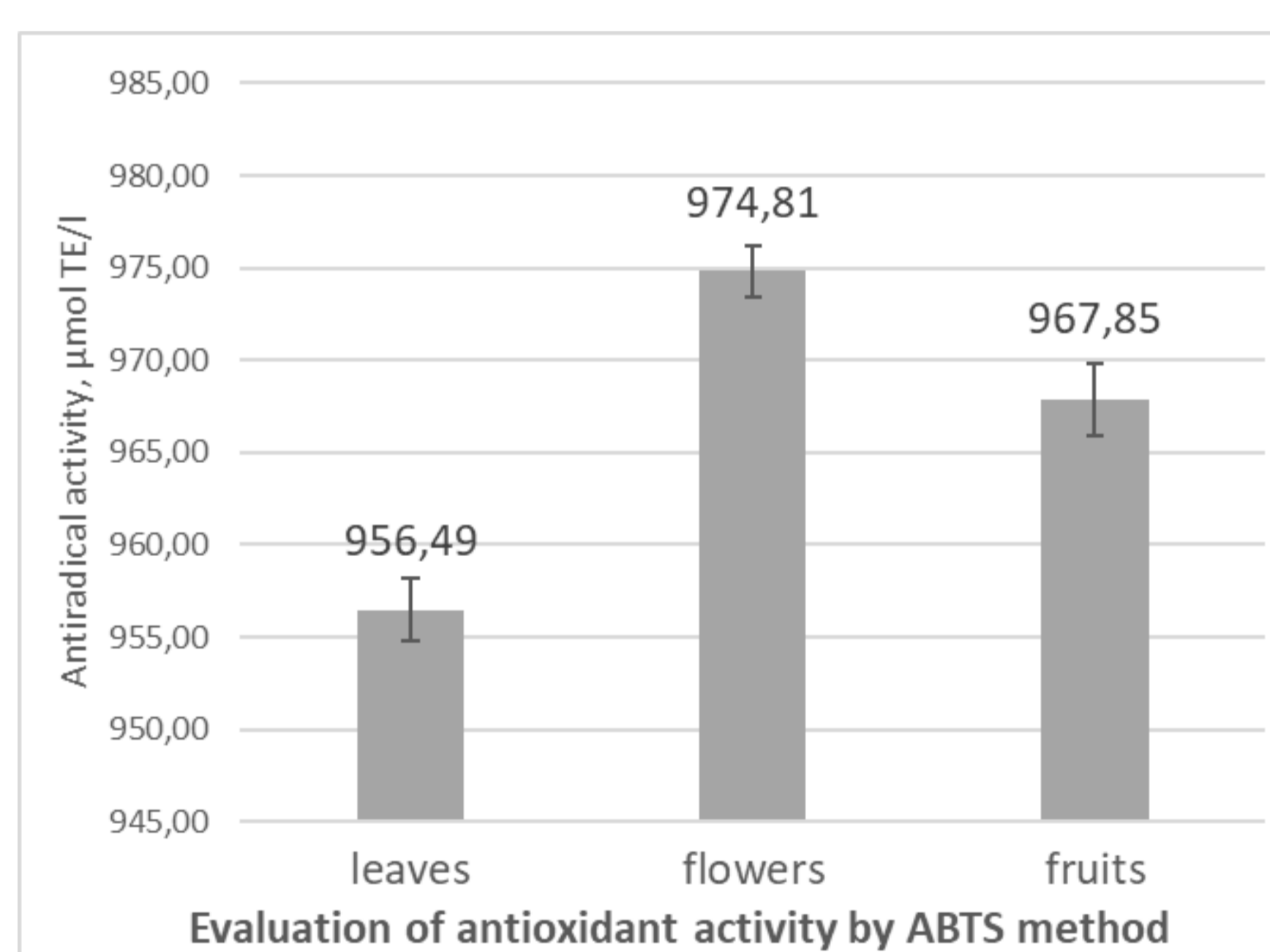
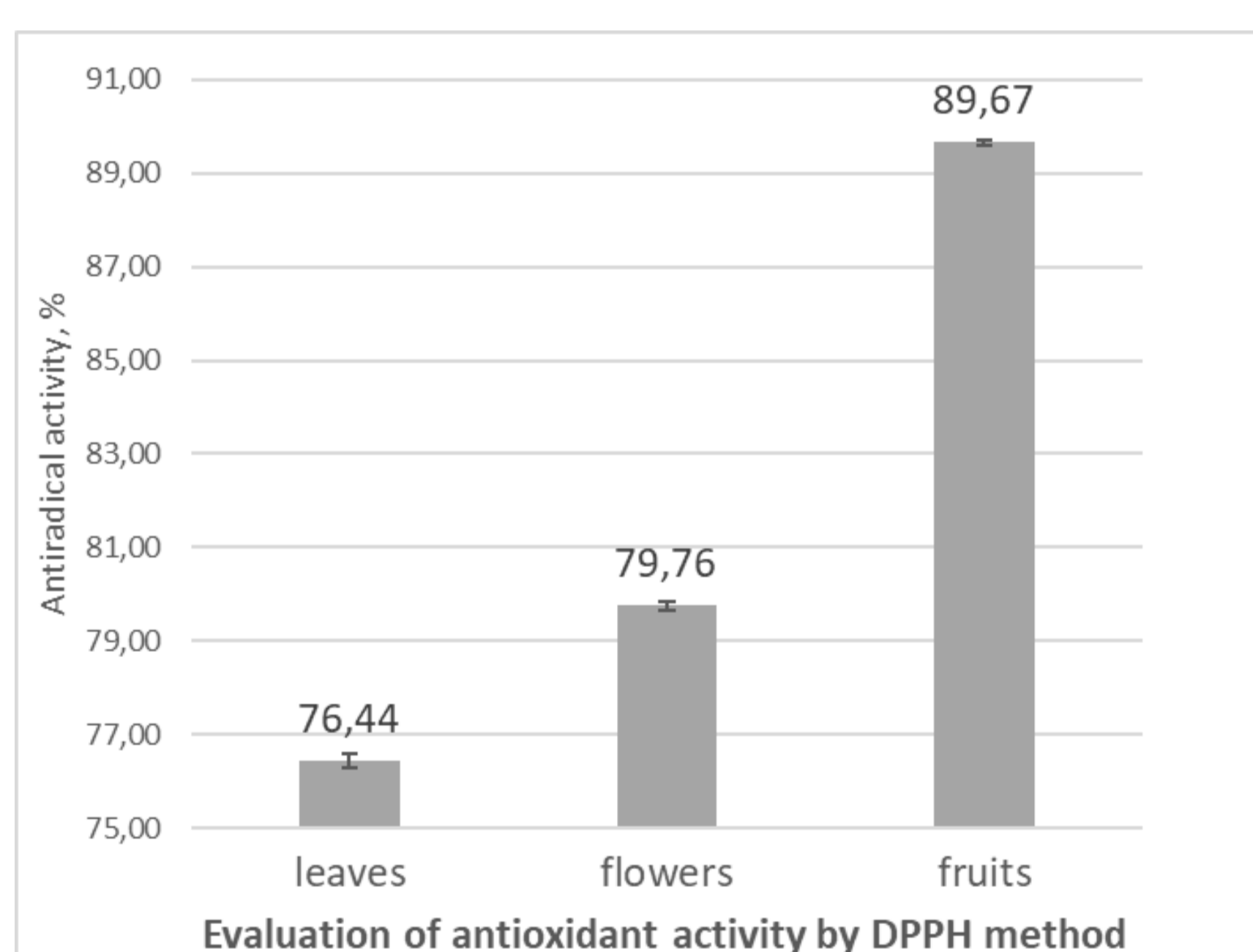
Materials and methods

Leaves, flowers and fruits of Staghorn sumac were collected in 2022-2023 in Raseiniai, Lithuania. Dried raw materials were extracted in 70% ethanol at 40 °C in an ultrasonic bath for 15 min. The total phenolic content was evaluated by Folin-Ciocalteu spectrophotometric method and antioxidant activity *in vitro* was evaluated by ABTS, DPPH and FRAP methods.



Results and discussion

The highest amount of total phenolic content was detected in leaf extract (120,00±11,28 mg GAE/g) and less in flower and fruit extracts (96,22±2,13 mg GAE/g; 86,77±1,35 mg GAE/g, respectively). The antiradical activity determined using DPPH method varied between 76,44±0,14% and 89,67±0,05%. The antiradical activity determined using ABTS method varied between 956,49±1,74 μmol TE/l and 974,81±1,37 μmol TE/l. The ability to reduce iron ions determined using FRAP method varied between 1126,7±12,15 μmol TE/l and 3054,08±150,89 μmol TE/l.



Conclusion

Leaves, flowers and fruits of Staghorn sumac (*Rhus typhina* L.) accumulate large amounts of phenolic compounds with strong antioxidant properties. The highest total phenolic content was found in leaf extract, while the strongest antioxidant activity *in vitro* differed in leaf, flower and fruit extracts depending on the method chosen.

References

1. Singletary, Keith W. "Sumac: Potential Health Benefits" Nutrition today, 2023-03, Vol.58 (2), p.77-83
2. Sunan Wang, Fan Zhu. "Chemical composition and biological activity of staghorn sumac (*Rhus typhina*)". Food Chemistry, 2017 Dec 15, Vol.237, p. 431-443

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