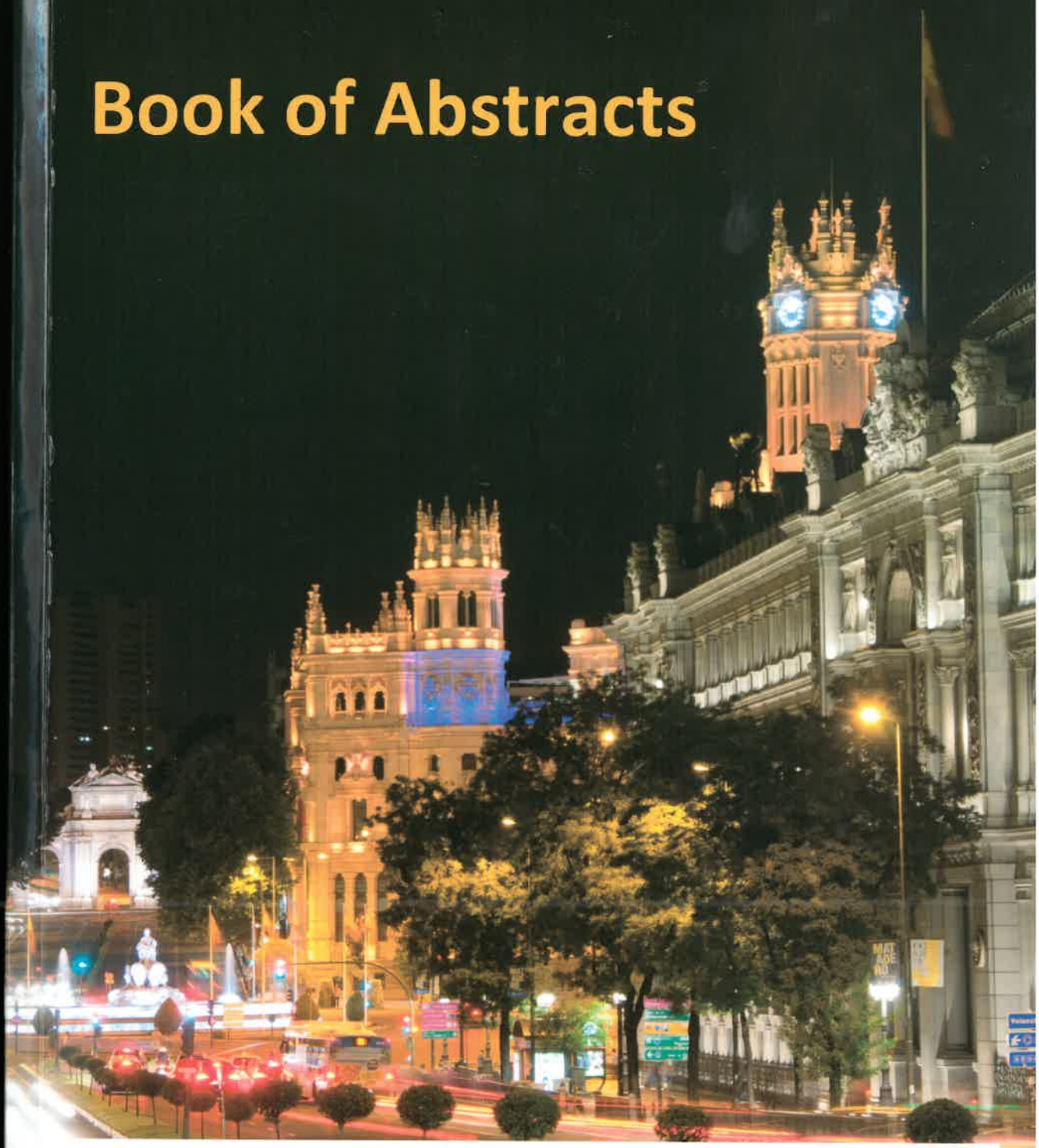
Book of Abstracts



Joint AIRAPT-25 & EHPRG-53

Madrid, Spain
2015

International Conference On High Pressure Science And Technology

August 30th
September 4th

AIRAPT-25 Madrid MMXV Hosted by ALTA EHPRG-53

[P1-22]

Influence of solvent and high pressure treatment in the extraction of bioactive compounds in *Gomphrena globosa* L.

Luana Fernandes [a,b,c]*, *Elsa Ramalhosa* [a], *José A. Pereira* [a], *Susana Casal* [b], *Jorge A Saraiva* [c]

[a] *Mountain Research Centre (CIMO) – School of Agriculture, Polytechnic Institute of Bragança, Bragança, Portugal*
[b] *REQUIMTE/Laboratory of Bromatology and Hydrology, Faculty of Pharmacy, Porto University, Porto, Portugal*
[c] *QOPNA - Organic Chemistry, Natural and Agro-food Products, University of Aveiro, Aveiro, Portugal*

Gomphrena species are edible, commercial ornamental and medicinal plants commonly known as Globe Amaranth or Bachelor Button.[1] The flowers of *Gomphrena globosa* L. have medicinal potential, once they are rich in bioactive compounds such as betacyanins, betalaines and flavonoids. Currently there is a very large and global interest in finding cheap and abundant sources of natural antioxidants. High pressure extraction has been recently applied to extract bioactive ingredients from plant materials, taking advantages of time saving, higher extraction yields, fewer impurities in the extraction solution, minimal heat and avoidance of thermal degradation on the activity and structure of bioactive components.[2] The present study aimed to compare the influence of different extraction solvents (water, methanol, water:acetone (6:4; v:v)) and methods (heating under agitation (37 °C, 30 min) and high pressure (300 or 500 MPa) at different times (7.5 or 15 min)) on the content of flavonoids, hydrolysable tannins and antioxidant activity (Total Reducing Capacity, Scavenging of DPPH free radical and Reducing Power) in flower extracts. The water:acetone extracts obtained by heating under agitation had the highest values of flavonoids, hydrolysable tannins and Total Reducing Capacity, as well as the lowest EC_{50} values of DPPH free radical scavenging activity and Reducing Power, suggesting higher antioxidant activity than other solvents. When performing high pressure extraction it was found that different results were obtained with different time and pressure combinations, as well as solvents. The highest values of hydrolysable tannins and flavonoids were obtained with the binomial time/pressure of 15 min/300 MPa for all solvents, while the lowest EC_{50} value of DPPH was obtained at 15 min/500 MPa, for all solvents. The others parameters differed on the binomial time/pressure for the three solvents studied. For all parameters the values ranges were higher without high pressure than with high pressure application. Generally, for water and methanol extractions higher concentrations of flavonoids, hydrolysable tannins and Total Reducing Capacity were obtained after application of high pressure treatment in comparison to the traditional method, suggesting a higher extraction efficiency. On the other hand, with the water:acetone mixture, higher values of the former parameters were obtained without high pressure application.

In conclusion, the solvent and method used in the extraction directly influence the content of bioactive compounds of Bachelor Button. The results showed that high pressure extraction can be a promising method to extract more natural antioxidants However, in future more studies must be performed on the compounds to be extracted after application of different time/pressure binomials to better understand their extractability.

References

[1] Y. A. Tarnam, M. H. M. Ilyas, T. N. Begum, *Int J Pharm Sci Rev Res.* **3**, 58-66 (2014).
[2] X. Jun, *Crit Rev Food Sci Nutr* . **53**, 837-852 (2013).

*Luana.f.1987@gmail.com
Keywords: *Gomphrena globosa* L., Extraction, High pressure, Antioxidant Activity