



th

# PYCHEM

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## Book of Abstracts

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**Book of Abstracts of the 6<sup>th</sup> Portuguese Young Chemists Meeting**



## Antimicrobial and antifungal activities of a coloring extract rich in betacyanins obtained from the flowers of *Gomphrena globosa* L

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There is a huge diversity of pigments from natural origin that can be exploited as colorants in the food industry. Nonetheless, they can additionally provide several bioactive properties, which represent an added-value for food products. Carotenoids, chlorophylls, anthocyanins and betalains are some of the most studied plant-based pigments. Betalains, can be subdivided according to their chemical structure into betacyanins and betaxanthins [1]. Although less exploited than *Beta vulgaris* L., *Gomphrena globosa* L. is an important source of betacyanins [2], with antimicrobial and antifungal activity [3]. Thus, the aim of this study was to obtain a pigmented extract from *G. globosa* with a high antimicrobial and antifungal activity. This objective was implemented by the application of the response surface methodology (RSM), a robust optimization technique that allows to study jointly the effects of several variables and responses, namely in extraction procedures (in this case ultrasound assisted extraction (UAE)). To evaluate the antimicrobial and antifungal properties, the responses were the minimum inhibitory (MIC), minimum bactericidal (MBC) and minimum fungicidal (MFC) concentrations. The optimized UAE conditions were: 10.8 min, 410.5 W, 57.8% ethanol content (ethanol-water mixtures were used) and 5 g/L as solid-liquid ratio, providing the following responses: 1) antibacterial activity: MIC of ~0.15-0.35 g/L and MBC of ~0.30-0.65 g/L; and 2) antifungal activity: MIC of ~0.20-0.30 g/L and MFC of ~0.40-0.65 g/L. In conclusion, the obtained results evidenced the potential application of the extracts from *G. globosa* as sources of betacyanins (natural colorants), but also as important antimicrobial and antifungal agents.

### References

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