5th Portuguese Young Chemists Meeting

(5th PYCheM)

&

1st European Young Chemists Meeting

(1st EYCheM)

Centro Cultural Vila Flor

Guimarães, Portugal

26th – 29th of April

ICVS/3B's

Câmara Municipal de Guimarães

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General Programme

	26 April	27 April	28 April	29 April
9:00-13:20	Registration and Workshop of Open Science and European Open Access Policies in H2020	Organic Chemistry and Medicinal Chemistry	Inorganic, Physical, Analytical and Electrochemistry	Materials Chemistry and Nanomaterials and Surface Chemistry
13:30	Opening Ceremony	Lunch	Lunch	Lunch
14:00 - 18:00	Green Chemistry + Chemistry of Natural Products	Biochemistry and Medicinal Chemistry	CHEM2NATURE Symposium: Chemical strategies for modification of natural origin materials Assembleia GQJ (17h)	Materials Chemistry and Nanomaterials and Surface Chemistry
18:00		Walking Tour		Closing Ceremony
19:00	Welcome Cocktail		Gala Dinner	
21:30	Get-together night			

P13. Phenolic profile of *Cynara scolymus* L. and *Silybum marianum* (L.) Gaertn and related antimicrobial properties

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Cynara scolymus L. (artichoke) and *Silybum marianum* (L.) Gaertn (milk thistle), belonging to the Asteraceae family, are medicinal plants with well-reported antioxidant and hepatoprotective effects. Widely consumed as infusions, these plants can also be found in several formulations to allow an easier consumption. The bioactivity of infusions, pills, and syrups based on artichoke and milk thistle was previously reported by our research group [1,2] and among the various phytochemicals present in these dietary supplements, phenolic compounds are pointed out as the most responsible for their beneficial properties. With the aim of studying the antimicrobial activity and possible relation with the phenolic composition, two different formulations of each plant were assessed (pills and syrups). The phenolic profiles were obtained by HPLC-DAD-ESI/MS, and the antimicrobial activity was performed with clinical isolates from hospitalized patients, namely *Escherichia coli*, *Escherichia coli* spectrum extended producer of β-lactamases (ESBL), *Proteus mirabilis*, *Pseudomonas aeruginosa*, and methicillin-resistant *Staphylococcus aureus* (MRSA).

Vanillic acid (5.58 μg/g) and luteolin-7-*O*-glucoside (2.2 μg/g) were the most abundant compounds in artichoke syrup, that did not reveal antimicrobial activity against the studied strains, which could be due to their low concentrations. On the other hand, artichoke pills presented a prevalence of 5-*O*-caffeoylquinic (28.2 μg/g), 1,3-dicaffeoylquinic (24 μg/g), and 4-*O*-Caffeoylquinic acids (13.3 μg/g); revealing the capacity to inhibit MRSA with a MIC value of 1.9 mg/g.

Regarding milk thistle, isorhamnetin-*O*-deoxyhexoside-*O*-hexoside, isorhamnetin-3-*O*-rutinoside, and isorhamnetin-*O*-deoxyhexoside-*O*-dihexoside were the major compounds detected in the syrup, in concentrations of 7.26, 5.75, and 3.64 μg/g, respectively. This formulation proved to be able to inhibit the growth of *E. coli*, ESBL, MRSA and *P. aeruginosa*, with MIC values ranging from 0.2 to 1.3 mg/mL. Hydroxylated silibinin (1.565 μg/g) was the major flavonoid found in the pills, that revealed antimicrobial activity against ESBL, with a MIC value of 15 mg/mL, but did not inhibit the growth of the remaining bacteria. None of the studied samples was able to inhibit *P. mirabilis* at the studied concentrations (1000 and 26.4 mg/mL for the syrups of artichoke and milk thistle, respectively; 150 mg/mL for both pills).

Overall, the studied syrups and pills of artichoke and milk thistle revealed to be a good source of phenolic compounds, with some of these formulations revealing antimicrobial activity.

References

[1] Pereira, C., Calhelha, R. C., Barros, L., Ferreira, I. C. F. R., Industrial Crops and Products 2013, 49, 61-65

[2] Pereira, C., Calhelha, R. C., Barros, L., Queiroz, M. J. R. P., Ferreira, I. C. F. R., Industrial Crops and Products 2014, 52, 709-713

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