

XXV ENCONTRO GALEGO-PORTUGUÉS DE QUÍMICA

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20-22 Noviembre 2019

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Trabajando por la sostenibilidad en la salud, el ambiente y
la seguridad alimentaria

20 al 22 de noviembre de 2019

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Santiago de Compostela-Galicia (España)



**Colegio Oficial de
Químicos de Galicia**



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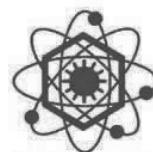
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		PLENARIAS	A	B	C	
		A				
21	10:00		QS14	NN01	AMB01	
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	10:30		QS16	NN03	AMB03	
	10:45		QS17	NN04	AMB04	
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	11:05		QS18	NN05	AMB05	
	11:20		QS19	NN06	AMB06	
	11:35		QS20	NN07	AMB07	
	11:50		QS21	NN08	AMB08	
	12:05-12:45	CAFÉ - POSTERS				
	12:45-13:30	CP2				
	13:30-15:00	ALMUERZO-COMIDA				
	15:00		QS22	NN09	AMB09	
	15:15		QS23	BB01	AMB10	
	15:30		QS24	BB02	AMB11	
	15:45		QS25	BB03	AMB12	
	BB04					
	16:05		QS26	BB04	AMB13	
	16:20		QS27	BB05	AMB14	
	16:35		QS28	QA12	AMB15	
	16:50		ALM06	QA13	AMB16	
	17:05-17:45	CAFÉ - POSTERS				
	17:45 - 18:30	CP3				
	18:30		ALM07	QF01	AMB17	
	18:45		ALM08	QF02	AMB18	
	19:00		ALM09	QF03	AMB19	
	19:15		ALM10	QF04	IND01	
	19:30		ALM11	QF05	IND02	
	19:45				IND00	
	21:00	CENA DEL ENCONTRO				

- AMB03 Contaminación y Acumulación de metales tóxicos (As, Al, Pb, Fe) en agua, vegetales y plantas medicinales de mayor consumo en la ciudad de Arequipa Perú
- AMB04 Superparamagnetic hybrid nanostructured materials for environmental decontamination
- AMB05 Efecto de la concentración de metales en la actividad de un biorreactor de membrana enriquecido en bacterias N-damo
- AMB06 Can the impact associated with critical rare elements be reduced through living macroalgae?
- AMB07 3D tuned porous carbon monoliths as catalysts in wet peroxide oxidation of paracetamol
- AMB08 Influence of agro-environmental conditions on phenolic compounds and biological properties of grape (*Vitis vinifera* L.) stems
- AMB09 Variación espacio-temporal de la concentración de Cr y Ni en suelos y sedimentos intermareales
- AMB10 Lipofilização de antocianinas baseado na retenção de enzimas em membranas porosas
- AMB11 Can the recycling of valuable europium from wastes be achieved through live macroalgae?
- AMB12 Monitorização de Pesticidas como Poluentes Emergentes em Rios do Nordeste de Portugal
- AMB13 Desenvolvimento de um sensor eletroquímico para a deteção de compostos fenólicos em águas
- AMB14 Polymeric coatings containing new antifouling synthetic bile acid derivatives to prevent marine biofouling
- AMB15 Pharmaceutical Drugs as Environmental Emerging Pollutants
- AMB16 White winery wastewater treatment by coagulation/flocculation optimized by a Simplex Lattice Design and O₃/Fe²⁺/UV process

Pharmaceutical Drugs as Environmental Emerging Pollutants

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Pharmaceutical drugs have been considered in recent years as one of the groups belonging to emerging contaminants regarding environmental pollution. Their presence in aqueous matrices is mainly related to emissions in their production, direct disposal in environment and human and/or animal excretion [1]. These pollutants can be found in rivers and other aqueous matrices, in very low concentrations, below the ppm level. As, normally, they occur in trace concentrations, their identification and quantification were complex tasks since they require very expensive and not so available analytical methods. Additionally, the actual European Legislation is still scarce for this called “emergent contaminants”. Nowadays, there is a strong interest in the development of inexpensive and acute determination methods for these compounds, to overcome the huge lack of information about the potential harmful effects in the living beings and in the environment.

In this study, it will be presented the development of a complete analytical methodology and its validation, for the detection and quantification of a set of eight different pharmaceutical drugs. The studied pharmaceutical drugs, azithromycin, sulfamethoxazole, caffeine, paracetamol, acetylsalicylic acid, ketoprofen, diclofenac, and carbamazepine, are representative drugs of several different therapeutic classes: two antibiotics, one central nervous system stimulant, two analgesics, two non-steroidal anti-inflammatories and one anticonvulsant, respectively.

Experimental results will include solid phase extraction (SPE) as an extraction/concentration technique followed by detection and quantification using high performance liquid chromatography with diode array detector (HPLC-DAD) [2]. The complete separation of all the studied compounds requires the use of two different columns and the optimization of two mobile phase compositions. For compounds with low pKa values a Nucleosil 100-5 C18 column is used with a solvent composed of acetonitrile:water:trifluoroacetic acid. For compounds with higher pKa values a SiliaChrom XT C18 column is used with a methanol:water:diethylamine solvent composition. SPE recoveries, calibration curves, limits of detection and quantification will be presented. Several samples were collected from three different rivers from the Bragança region and the developed methodology was implemented to measure drugs concentration.

References

- [1] I. Baranowska, B. Kowalski. Polish Journal of Environmental Studies, 20 (2011) 21.
- [2] A. Nemoto, M. Gonçalves, A. Ribeiro, P. Brito, A. Queiroz. Proc. of XXIV Encontro Luso-Galego de Química, 2018, QAMB56.