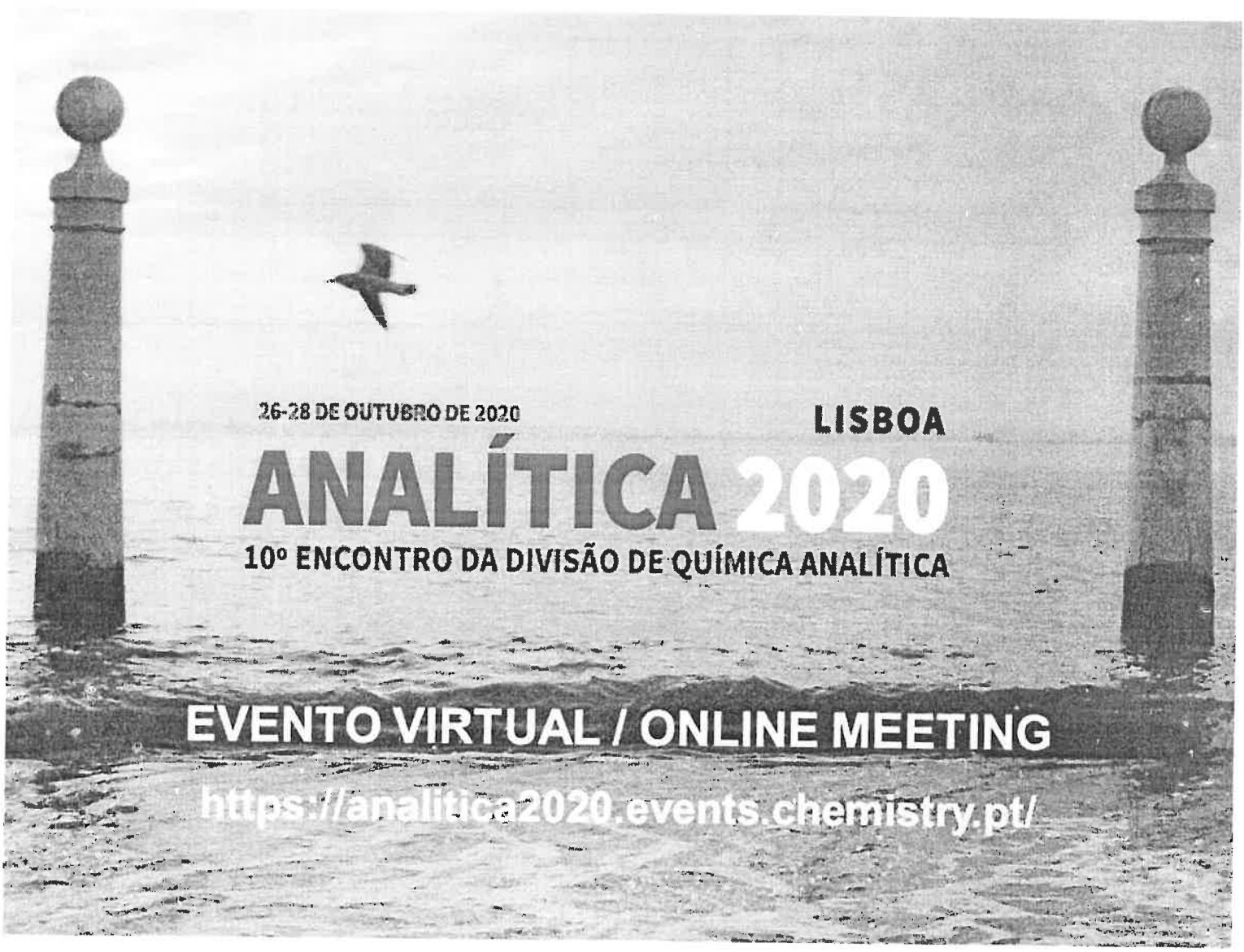

LIVRO DE RESUMOS

BOOK OF ABSTRACTS

U LISBOA | UNIVERSIDADE DE LISBOA

FC Ciências ULisboa

SOCIEDADE PORTUGUESA DE QUÍMICA

TÍTULO
Livro de Resumos do Analítica 2020 – 10º Encontro da Divisão de Química Analítica

CONSELHO EDITORIAL
Nuno R. Neng, FCUL
Samir M.E. Ahmad, FCUL
Vanessa Morgado, FCUL
Cristina M.R. Oliveira, FCUL

TIPOGRAFIA E DESIGN GRÁFICO
Nuno R. Neng, FCUL
Samir M.E. Ahmad, FCUL
Vanessa Morgado, FCUL
Cristina M.R. Oliveira, FCUL

EDITOR
Sociedade Portuguesa de Química
Av. da República, 45 - 3º Esq
1050-187 Lisboa - Portugal
ISBN: 978-989-8124-30-2

DATA
Outubro 2020

CHEMICAL QUALITY OF DINKING-WATER IN A NORTHEAST REGION OF PORTUGAL

Andrea F. Afonso[1], Bruno Pires[1], Eugénia Afonso[1], Cristina Teixeira[2], António Nogueira[3]

[1]*Laboratório de Saúde Pública de Bragança, Unidade Local de Saúde do Nordeste (ULSNE), Rua Eng. Adelino Amaro da Costa, Bragança, Portugal. andrealfa@live.com.pt*
[2]*Unidade de Investigação em Epidemiologia (EPIUnit), Instituto de Saúde Pública da Universidade do Porto, Rua das Taipas, nº 135, 4050-600 Porto, Portugal*
[3]*Centro de Investigação de Montanha (CIMO), Instituto Politécnico de Bragança (IPB), Campus de Santa Apolónia, 5300-253 Bragança, Portugal*

The chemical and microbiological quality of drinking-water should be considered within overall public health priorities [1]. A poor quality of drinking-water, due to insufficient disinfection or by human contamination, can be a vehicle for transmitting diseases to consumers. Thus, the quality of both raw water (surface water and groundwater) and the drinking-water has a strong impact on the public health. Among the contaminants, nitrates (NO_3^-) and faecal indicators (such as thermotolerant coliforms, *Escherichia coli* and enterococci) represents a major concern because these factors have been associated with adverse health outcomes [1,2]. This study analysed contaminants in drinking-water samples (n=361), including surface water and groundwater in the district of Bragança (during the year 2019), according the standardized protocols [3]. We evaluated the relationship of NO_3^- concentration with microbial drinking-water parameters (heterotrophic plate count-HPC and faecal indicators), as well as, operational parameter used to assess the performance of a water-treatment process (chlorine residuals and pH) [1]. The nitrate concentration (3.38±5.79 mg/L) presented a significant relation with the presence of the fecal contaminant enterococci ($p=0.011$). There were significant differences ($p<0.001$) in regards to nitrate concentration between the water samples according to their provenience, such that groundwater presents higher concentration (mean varying from 4.51 to 6.48 mg/mL) than surface water (mean varying from 1.09 to 1.69 mg/mL). The results also showed that, beyond the presence of enterococci, HPC and coliform bacteria was associated with lower levels of residual chlorine ($p= 0.008$) and pH ($p= 0.004$), respectively.
The results suggest the relevance of chemical evaluation of drinking-water and the linking to the microbiological contamination and the operational control of water-treatment process.

Acknowledgements: We acknowledge to Unidade Local de Saúde do Nordeste.

[1] World Health Organization, in Developing Drinking-Water Quality Regulations and Standards, World Health Organization, Geneva, **2018**.
[2] Mary, H. Ward M. H.; Jones, R. R.; Brender, J. D.; Kok, T. M.; Weyer, P. J.; Nolan, B. T.; Villanueva, C. M.; Breda, S. G. Drinking Water Nitrate and Human Health: An Updated Review. International Journal of Environmental Research and Public Health **2018**, 15, 1557.
[3] Standard Methods for the Examination of Water and Wastewater. E.W. Rice, R.B. Baird, A.D. Eaton (23 Eds.), Washington DC, American Public Health Association, **2017**.