

## Water Quality of the Fervença River Hydrographic Basin: Microbiological Impact of Anthropogenic Activities

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Microbiological monitoring of natural waters is of utmost importance for their evaluation in terms of public health.

In this study the microbiological water quality of the Fervença river hydrographic basin, Bragança, Portugal, was evaluated. This river results from the confluence of streams and water lines of natural runoff on the north side of the Serra da Nogueira (rural environment), crosses the city of Bragança (urban environment with a downstream wastewater treatment plant, WWTP) and flows into the river Sabor (rural environment).

Sampling included 4 samples upstream of the city of Bragança, 4 samples in the city, one immediately after the WWTP and 2 samples downstream of Bragança, being the last one at 10 km of the urban center. The samples were collected in the same day, transported in thermal suitcases, refrigerated and analyzed in the microbiology laboratory of the IPB, in the parameters: *Escherichia coli* and Intestinal *Enterococci*.

These parameters were evaluated considering the Portuguese Republic Decree-Laws on the quality of bathing water, n° 236/98 of 1 August and n° 113/2012 of 23 May, which are based on the microbiological analyzes of *Escherichia coli* (recommended maximum limit of 1000 CFU/100 mL) and faecal *Streptococci* contents (recommended maximum limit of 400 CFU/100 mL).

Results showed that the levels of *Escherichia coli* in the urban environment waters exceed  $4.0 \times 10^3$  CFU/100 mL, worsening after the WWTP, where the value of  $1.3 \times 10^6$  CFU/100 mL was reached. In the case of fecal *Streptococci*, levels above  $1.3 \times 10^5$  CFU/100 mL were obtained in all samples, except in sample of the Castanheira water reservoir.

The high microbiological load present in the waters sampled in the Fervença river hydrographic basin questions its use for bathing or for irrigation purposes, suggesting that the quality of the water is “Bad” which may constitute a risk to Public Health.

### Biography:

Luís Santos has a degree in agro-industrial engineering, obtained at the Institute of Agronomy of the Technical University of Lisbon in 1986 and master in Plant Nutrition, Soil Fertility and Fertilization by the Institute of Agronomy of the Technical University of Lisbon in 1994.

Presently, he is a professor and researcher at the Polytechnic Institute of Bragança since 1988, on the food science, biotechnology and environment areas