Contribution ID: **24** Type: **not specified**

Evaluation of well waters from Ceramic district in city of Beira in Mozambique by chemometric classification methodologies

Thursday, 29 May 2025 15:32 (3 minutes)

In the Ceramic district of the cityt of Beira in Mozmabique the drinking water became from treated piped water and from traditional wells without water treatment. Nine sampling sites of water from wells use for human consumation in the Ceramic district near a cemetery were chosen to do an evaluation of the quality of the water of the wells and check the similitudes of the water of different wells. The sampling of water from wells was done by convenience sampling attending to localization of the wells. Nine sampling sites were chosen in order to evaluate the quality of the water and check their similitude in terms of the physical-chemical and microbiological parameters. The nine collected samples were then placed in the fridge [1,2].
The sampled water was then classified attending to the principal physico-chemical and microbiological analytical parameters. The physico-chemical parameters analysed were the pH, conductivity, electrical conductivity (EC), temperature, ammonia, calcium, magnesium, iron, nitrate, nitrite, sulphate, phosphate, chemical oxygen demand (COD), silica, alkalinity, copper, barium, cadmium, cobalt, nickel, zinc, ethilbenzene, styrene, chloromethane, di chloromethane, trichloromethane, chloroethane, biphenyl, tribromomethane, total hydrocarbons C10-C12, bromodichloromethane and dibromochloromethane concentrations. The microbiological parameters analysed are the most probable number (MPN) of fecal and total coliforms.
A classical chemometric cluster analysis was performed in order to evaluate the water samples and the more statistically significant variables that contribute to the variability of the model. A hierarchical and non-hierarchical K means cluster analysis were initially performed in order to evaluate the possible number of cluster and the more statistically significative variables that influence the cluster analysis. Also a two-step cluster analysis was also performed in order to more deeply understand the results of the initial cluster analysis [3,4].
By a non-standardized hierarchical cluster analysis, a two clusters model, a first cluster with two samples and a second cluster with five samples, or a three clusters model, a first cluster and a second cluster with two samples and a third cluster with five samples, seems to be the more adequate cluster models. The same results are found using the method based in the linkage between groups and the Ward's method as cluster models. A more stable model with two clusters with a great number of statistically significative variables was found with the two clusters model. The two-step cluster analysis allows to confirm that the two-cluster model is the most adequate model. Also, by two-step cluster analysis, and for the two-cluster model, the more important predictor found is the concentration of ammonia and the less important predictor is the pH.

Type of presentation

Poster

Primary authors: Prof. LEITÃO, João (University of Coimbra - Pharmacy Faculty); CHINGUELA, Flávia (Chemistry Research Unit (CIQUP), Institute of Molecular Sciences (IMS), DGAOT, Universidade Licungo, Faculdade de Educação); Dr SULUDA, António (Universidade Licungo, Faculdade de Educação); Prof. ESTEVES DA SILVA, Joaquim (Chemistry Research Unit (CIQUP), Institute of Molecular Sciences (IMS), DGAOT)

Presenter: Prof. LEITÃO, João (University of Coimbra - Pharmacy Faculty)

Session Classification: Poster

Track Classification: Spring Meeting