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Microbiological and physicochemical quality of water used for watering vegetable crops in Brazzaville

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Use of raw water in agriculture can be a source of contamination of agricultural products with harmful consequences for consumers. Objective of this study was to assess physicochemical and bacteriological quality of irrigation water used for watering vegetables in Brazzaville. Seven water samples and two vegetable samples were taken from the trial garden in Brazzaville. Physicochemical and bacteriological parameters were determined respectively by photo spectrometry and enumeration on specific agar medium after dilution. Results showed that physicochemical parameters vary from one sample to another with relatively low contents of iron (≤ 0.12 mg/L), chloride (≤ 13.9 mg/L), ammonium (≤ 0.27 mg/L), nitrate (≤ 0.34 mg/L) and nitrite (≤ 0.1 mg/L). FAMT was elevated in almost all samples with values greater than 105 CFU/ml(g) of sample. Total Coliforms were present in almost all samples with values > 104 CFU/ml(g) of sample, except (W2) well water sample which is free of Coliforms. Finally, *Pseudomonas aeruginosa* were counted only in the water samples of well (W2), river water (RW1), of vegetable sprinkled with the well water (VSW) and vegetable sprinkled with the water of river (VSR). PCA and hierarchical

classification separated these samples into two groups. A group containing only the R2 sample dominated by faecal coliforms and a second group composed of the other samples where FMAT and *P. aeruginosa* was representative. Canonical analysis, carried out with two types of parameters, shows that presence of *P. aeruginosa* in W2 is influenced by electrical conductivity, dissolved substance content, chlorides and chlorine. In the RW2 sample, growth of total coliforms is related to temperature, pH, iron and nitrite ions. Finally, nitrate and ammonium ions influence development of FMAT in the other samples. In conclusion, raw water used for watering vegetable crops in the trial garden of Brazzaville is of poor bacteriological quality.

Speaker Biography

Lebonguy AA obtained his unique doctorate in 2019 at Marien NGOUABI University in Brazzaville (Congo). Currently he is researcher at the National Institute for Research in Exact and Natural Sciences in the Applied Microbiology Laboratory. He also assumes the function of director of IRSEN-Brazzaville research area. He has more de 15 articles published in indexed scientific journals.

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