

Ostracods are a significant component of groundwater ecosystems, affected by both abiotic environmental factors and biotic interactions. This study investigates the factors influencing ostracod communities in groundwater from dug wells in several regions of Benin, West Africa, which experiences chronic anthropogenic disturbances such as nutrient enrichment from sewage and fertilizer infiltration. We evaluated the presence of ostracod species in 219 wells across seven catchment areas, examining 31 predictor variables, which include a variety of water quality parameters, hydrology as well as several well characteristics such as closure, usage and well construction type. The influence of these variables was analyzed using distance-based linear models and redundancy analysis. Our research identified 60 ostracod species, which we classified into two ecological groups: 1) 36 stygobitic species from the family Candonidae, representing an endemic evolutionary radiation, and 2) 24 non-stygobitic species, mostly from the family Cyprididae. Through our analysis, we identified several key factors influencing ostracod community structure, with consistent patterns observed at both species and genus levels. The primary predictors, aside from well descriptors, included water chemical and physical properties, such as electrical conductivity, pH, temperature, and bicarbonate concentration, along with NO₂⁻ concentration, a factor not previously demonstrated to be crucial for ostracod assemblages. Elevated nitrite levels in groundwater were found to significantly affect the distribution of stygobitic and non-stygobitic ostracods. Stygobites were notably less frequent in environments with higher NO₂⁻ concentrations, likely due to their greater vulnerability to periodic or chronic anthropogenic disturbances compared to non-stygobites. Therefore, we suggest that stygobitic ostracod species, identifiable even at the genus level, have a potential as reliable indicators of groundwater quality in the tropical regions of western Africa.