

Aquatic ecosystems are currently being subjected to major transformations as a result of anthropogenic actions and the effects of climate change, with a significant impact on public health by increasing the prevalence of water-borne diseases in Africa. Monitoring of groundwater quality is therefore becoming crucial to ensure clean drinking water supplies and preserving local ecosystems. Ostracods are small and bivalved aquatic crustaceans and due to their sensitivity to environmental variations, they are considered to be reliable bioindicators, although an accurate understanding of their ecology and distribution is required. Between 2015 and 2022, ostracods were sampled from more than 200 wells distributed over four catchment areas in Benin to explore the potential of ostracods as bioindicators. Sixty species of ostracods were identified and divided into two distinct ecological groups: 36 new to science stygobitic species from the family Candonidae, marking an endemic evolutionary radiation, and 24 non-stygobitic species, mainly from the family Cyprididae. Five new species of Candonidae were described, belonging to a new genus and subfamily, characterised by distinctive features such as a sevensegmented antennule, a specific caudal ramus, and other features of carapace and hemipenis morphology. Presence of ostracods was studied as a function of predictor variables, including water quality variables and other characteristics of the wells. The results showed that factors such as electrical conductivity, pH, temperature, bicarbonate concentration and NO<sub>2</sub><sup>-</sup> levels significantly influenced the structure of ostracod communities. Stygobitic species compared to non-stygobites were found to be particularly sensitive to high nitrite levels, highlighting their vulnerability to anthropogenic disturbance. Thus, we conclude that the new stygobitic ostracod species, show promising potential to serve as reliable bioindicators for groundwater quality in tropical West Africa.

Keywords: Freshwater Ostracoda, Africa, water quality, ecology, bioindicators