

Abstract

The inappropriate use of chemical fertilizers and pesticides in rice farming has been identified as a significant source of pollution in the aquatic environments. The declining water quality has been a cause of concern for the riparian communities owing to ill health associated with the usage of contaminated water from lotic systems draining such rice-growing areas and its potential to cause lethal and sublethal effects on aquatic organisms. The spatial variation of selected water quality parameters was assessed using multivariate techniques. Data from three sampling stations, collected in triplicates, were analyzed to understand the effects of rice farming practices on the Dakalt Branch Canal's water quality. Eleven physicochemical parameters were measured in situ with a portable multimeter, while nutrients and other chemical parameters were determined following the standard procedures outlined in the American Public Health Association using the UV/Visible spectrophotometer. One-way ANOVA was used to establish whether or not there were significant differences among means of various parameters. The findings revealed considerable spatial variability in the means for nearly all water quality parameters ($p < 0.05$). The Water Quality Index revealed that all the sampling stations were polluted with indices of more than 100. We conclude that poor rice management practices are responsible for the observed pollution of the River Nile and potentially lethal and sublethal effects on aquatic organisms and human health. We therefore recommend regular monitoring of the water quality of the Dakalt Branch Canal and that the relevant stakeholders, including farmers, embrace Best Management Practices, especially when applying pesticides and fertilizers.