Spatial patterns of benthic diatom community structure in the largest northwestern river of Cambodia (Sangker River)

To date, very little is known about the relative importance of physicochemical factors structuring the benthic diatom community in the flood-pulse tropical ecosystems. This paper aims to investigate the spatial distribution of the benthic diatom community in a poorly studied river catchment of the Tonle Sap Basin in Cambodia. Diatom samples were collected at nineteen (19) monitoring sites from 2018 to 2023 along the Sangker River, and the hierarchical clustering technique was applied to characterize the variation in diatom community structure based on the similarity of diatom genera composition. Seventy-eight (78) diatom genera belonging to 36 families, 18 orders, and 5 classes of diatom flora were recorded. Gomphonema Ehrenberg, Nitzschia Hassall, and Navicula Bory were the most dominant diatom genera in the catchment area. Accordingly, three main diatom assemblages (Ia, Ib, and II) were classified, and 11 indicator genera were identified. Indeed, the identified assemblages reflect the change of diatiom community composition from the upstream assemblage (Ia), middle course (Ib), and floodplain assemblage (II). Dissolved oxygen (DO), pH, conductivity (EC), total phosphorus (TP), and silicon dioxide (SiO2) were the physico-chemical determinants of benthic diatom communities, while physical factors (DO, pH, and nutrients) seemed to be more important than chemical factors. Consequently, any disturbances to the physical condition of the river would drive an abrupt shift in the diatom community's diversity and structure. These findings pave an essential step towards the establishment of sustainable biomonitoring programs in developing countries such as Cambodia to protect aquatic ecosystems from global change.

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