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Impact of changing the management of an urban wetland on its biodiversity and its ecological functions through the study of planktonic communities: the case of the Tasdon wetland (Charente-Maritime)

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Abstract

Wetlands are typically ecosystems sheltering a high biodiversity. They provide many ecosystem services such as water purification, can act as buffer zones against flooding, and recreational area for people. Proper management of wetlands is therefore crucial in order to preserve their assets. The objective of this study is to determine the impact of the renaturation of a coastal urban wetland (Tasdon, Atlantic coast of France) including watercourses rectification, landscapes remodelling and reconnection to coastal waters, on biodiversity and ecological functioning by studying planktonic communities. A first series of seasonal sampling of abiotic factors (nutrient concentrations, temperature, salinity, pH, etc), and biotic factors (bacterial, phytoplanktonic and zooplanktonic communities) was carried out in 2019, prior to the redevelopment of the wetland, at 3 stations at different seasons. The redevelopment of the wetland was analysed to determine the planktonic diversity and their biomass, and to characterize the succession of food webs for each station and the associated ecological functions. Initial results showed that in 2019, the Tasdon wetland displayed a high plankton diversity (66 metazooplankton species) including 3 tropical species. The highest diversity within the stations was observed in summer. Four types of food webs have been identified, and their succession is largely dependent on a seasonal effect. Comparison with the results of a second sampling campaign, carried out in March 2021, will allow to assess the impact of water management change on plankton diversity, food webs structure and functioning. This comparison should provide with crucial knowledge to adapt wetland water management to optimize the ecological functions that support a rich biodiversity and its assets.

Keywords

food web, renaturation, biodiversity, ecosystem services