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The environmental importance of Pinheirinho wetland for water quality in the dam reservoir of Jundiaí Mirim River - SP

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Abstract

Wetlands are constantly or seasonally flooded areas, the prolonged presence of water creates conditions that favor the growth of specially adapted plants, which provide an improvement in water quality, since this vegetation forms a balanced ecosystem recycling the nutrients through chemical, physical and biological processes . Therefore, the objective of this study was to evaluate the influence of this wetland on the water quality. The parameters analysed were phosphate, nitrate and E. coli. Physical-chemical and microbiological analyzis of water were carried out in two sub-points, one upstream and the other downstream the wetland. It was possible to verify that the wetland works favorably in the purification and maintenance of the water supply dam in Jundiaí.

Key words:
wetland, water quality, Jundiaí Mirim river

Introduction

The sub-basin of Jundiaí Mirim River, located in Jundiaí-SP, in Pinheirinho neighborhood, has an wetland, which is located upstream of Jundiaí Mirim river dam, in the supply dam. Pinheirinho micro-basin has an area of 463.7 km² and it is located on the right bank of Jundiaí Mirim River, forming a 7.8 km water network. In this sub-basin there are constructions and farms that often disrespect the edge riverside, besides the deforestation of the vegetation and waterproofing of the soil[1].

Results and Discussion

Physical and chemical analyzes were carried out upstream and downstream of Pinheirinho wetland, from March 2015 to December 2016.

Figure 1 shows that all the nitrate data downstream of the wetland are lower than upstream values, indicating that when passing through the wet area the nitrate may have been absorbed by the plants and algae, which use this nutrient in their protein synthesis processes, or even the removal of nitrate by denitrifying bacteria. The combination of shallow water, high levels of nutrients and primary productivity is ideal for the development of organisms[2].

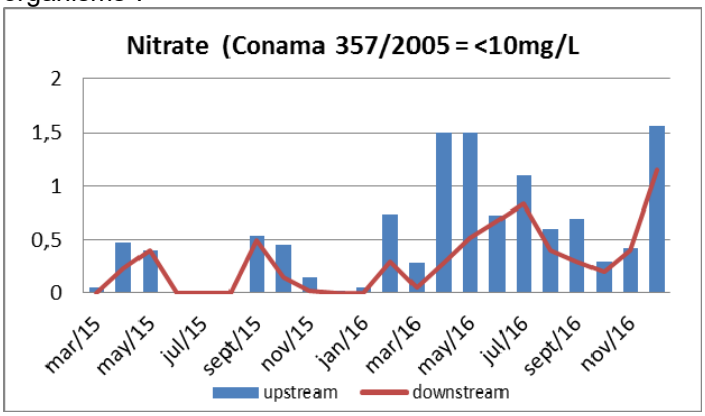

Figure 1 – Nitrate, bars represent upstream data and line represents downstream data.

In figure 2 the data on total coliforms, upstream and downstream of Pinheirinho wetland are represented. The data downstream have lower values except in July and August 2015 where the values remained and July 2016 where the value was higher. It is known that the coliforms are indicators of pathogenic organisms in the water, consequently the wetland worked positively in the decrease of this parameter. This may have occurred due to the competition or predation of these bacteria with and by other microorganisms present in the area [3].

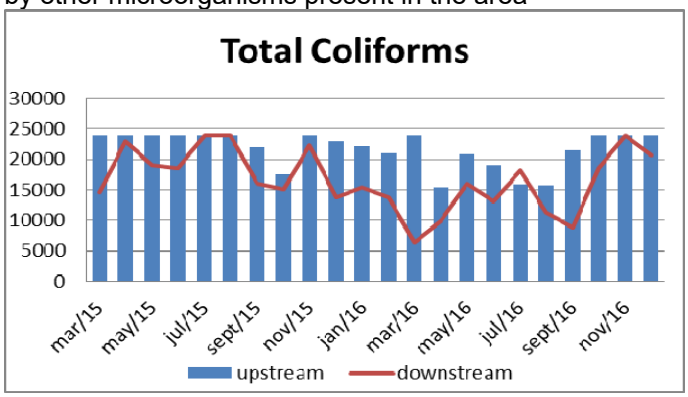

Figure 2 – Total coliforms (E. coli), bars represent upstream data and line represents downstream data.

Conclusions

Upstream-downstream analysis shows that there is an indication that Pinheirinho wetland plays an important role as a natural filter and preservation of the supply quality, probably due to the macrophytes present in the ecosystem, because its roots absorb present nutrients, contributing to the reduction of eutrophication processes. Wetlands are among the most productive ecosystems in the world and commonly Wetland systems served as natural water treatment systems. Further studies should be carried out.

Acknowledgement

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