

THE SIGNIFICANCE OF BACTERIA AND
ZOOPLANKTON FOR THE NUTRIENT
(NITROGEN AND PHOSPHORUS)
REGENERATION IN PAMPULHA RESERVOIR,
BELO HORIZONTE, MINAS GERAIS, BRAZIL

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In eutrophic lakes, like Pampulha reservoir, there is a lack of information concerning the role of the internal load of nutrients, such as nitrogen and phosphorus. In this paper, we estimated the rates of excretion of ortophosphate (Ep) and ammonia (Ea) and the respiration (R) by unity of biomass under different levels of bacteria. The zooplankton was collected by vertical nets hauls (3,0 m) and transported to the laboratory. Different concentrations of zooplankton (160 μm) were used. The incubation lasted 4 hours under controlled conditions of light and temperature (26°C). The variation of the concentrations of ammonia, ortophosphate, dissolved oxygen and the zooplankton composition and biomass were determined at the end of each incubation.

The experiment with antibiotics (G Potassic Penicillin 0.7g/l and Streptomycin 0.07g/l) presented the following results:

	Ep ($\mu\text{g}/\text{mg DWh}$)	Ea ($\mu\text{g}/\text{mg DWh}$)	R ($\text{mgO}_2/\text{mg DWh}$)
no antibiotic	0.28 \pm 0.12	2.14 \pm 0.09	0.02 \pm 0.01
antibiotic	0.82 \pm 0.50	1.45 \pm 0.72	0.02 \pm 0.01

n=1

The phosphorous excretion rates were clearly higher when bacterial activity was experimentally reduced through addition of antibiotics. This indicated that the community of free living bacteria is able to absorb the P-excreted by zooplankton very rapidly and, therefore, this can explain why the soluble P-concentrations remain relatively low in lake water. Note that respiration rates of zooplankton were not affected by the experimental addition of antibiotics.

It was confirmed that the free living bacteria and zooplankton affect "internal load" rates in different ways and that the nutrient proportions such as N:P ratios can be seen as a result of both processes.