Introduction

Microzooplankton (size category 20 to 200 µm) grazers, usually dominated by protozoa, can remove up to 60–75% (about 2/3) of daily primary production (PP), with the remaining 1/3 being channelled directly through mesozooplankton or lost by viral lysis, settling and advection processes (Calbet et al., 2007; Ignell et al., 2003; Moinis and Goske, 2003; Reckermann, 1996). In this study we focused on microzooplankton grazing rates in eutrophic coastal lagoon (Fig. 1). We applied dilution experiments and phytoplankton size-fractionation to experimentally evaluate the differences in microzooplankton and phytoplankton community structures, grazing and growth rates between the freshwater and brackish water parts of the lagoon. The experiments were made with two communities representing the two extremes of the habitat: a high salinity sample from an area with extreme salinity variability, and a freshwater sample from an area with constant freshwater regime. Our hypothesis is that the grazing efficiency varies according to the microzooplankton community structure.

Experimental design

Water samples for the experiments were collected from two sites: freshwater (salinity 0) in August and brackish water (salinity 6) in October 2009. Dilution experiment was performed according to Landry and Hassett (1982). The dilution method is based on the reduction of encounter rates between predator (microzooplankton) and prey (phytoplankton) by progressive dilution of natural or whole communities with particle free water from the same water basin.

Microzooplankton community structure

At both experimental sites microzooplankton was dominated by ciliates (99% of total abundance), while the number of metazoa was very low, composing 1% of the total microzooplankton abundance at both experimental sites. In the brackish water site nano-filters were dominated by tintinnids and large naked oligotrichs: they shared 48% of the total ciliate abundance. In the freshwater site pico/nano-filters and pico-filters prevailed (77% of the total abundance) (Fig. 4).

Conclusion

Microzooplankton community removed up to 76% of the total daily PP of picophytoplankton. The observed differences were attributed to the changes in ciliate community trophic structure, with nano-filters dominating the brackish water assemblage and pico-nano filters prevailing in the freshwater part of the lagoon.