Microbial dynamics and flagellate grazing during transition to winter in Lakes Hoare and Bonney, Antarctica

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Abstract	The planktonic microbial communities of Lakes Hoare and Bonney were investigated during transition into winter. We hypothesized that the onset of darkness induces changes in the functional role of autotrophic and heterotrophic microplankton. Bacteria decreased in Lake Hoare during March?April, while in Lake Bonney bacterial abundances varied. Heterotrophic nanoflagellates (HNAN), phototrophic nanoflagellates (PNAN) and ciliates showed no marked decline with the onset of winter. PNAN outnumbered HNAN in both lakes. Grazing rates of HNAN in Lake Hoare ranged up to 30.8 bacteria per cell day?1. The HNAN community grazed between 3.74 and 36.6 ng of bacterial carbon day?1. Mixotrophic PNAN had grazing rates up to 15.2 bacteria per cell day?1, and their daily community grazing exceeded bacterial production. In Lake Bonney East, PNAN grazing rates ranged up to 12.48 bacteria per cell day?1 and in Lake Bonney West up to 8.16 bacteria per cell day?1. As in Lake Hoare, the mixotrophic PNAN grazing rates (up to 950 ng C day?1) usually exceeded bacterial production. HNAN grazing rates were generally similar to those in Lake Hoare. As winter encroaches, these lakes move progressively towards heterotrophy and probably function during the winter, enabling populations to enter the short austral summer with actively growing populations.
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