

A natural plankton population from the eutrophic lake Cacique Chiquichano, in the Argentine Patagonia, was monitored for one year to evaluate changes in photosynthetic parameters as a result of exposure to ultraviolet radiation (UVR, 280-400 nm), grazer abundance, and the taxonomic composition of the phytoplankton community. Both physical (temperature, solar radiation) and biological (grazers, taxonomic composition, photosynthetic parameters) variables fluctuated throughout the study. Crustacean zooplankton showed alternating dominance between cladocerans (*Daphnia spinulata*) and copepods (*Metacyclops mendocinus*). The phytoplankton community underwent concomitant changes throughout the year, with cyanobacteria and diatoms alternately dominating. In addition, although copepod abundance was not significantly related to changes in phytoplankton, the presence of *D. spinulata* was significant during periods of more transparent water; these periods were dominated by diatoms. On the other hand, cyanobacteria dominated the phytoplankton assemblage when the penetration of solar radiation into the water column was lower. Photosynthetic inhibition due to UVR decreased during the diatom-dominated periods. In contrast, inhibition increased along with the proportion of cyanobacteria, likely as a result of acclimation to low irradiance during the lake's phase of lower transparency. Moreover, the presence of *D. spinulata* was associated with the increased penetration of solar radiation into the water column, resulting in an indirect increment in the inhibition of cyanobacteria photosynthesis. The results suggest that both solar radiation and grazing abundance strongly influence the dynamics and photosynthetic activity of the phytoplankton in Lake Cacique Chiquichano.