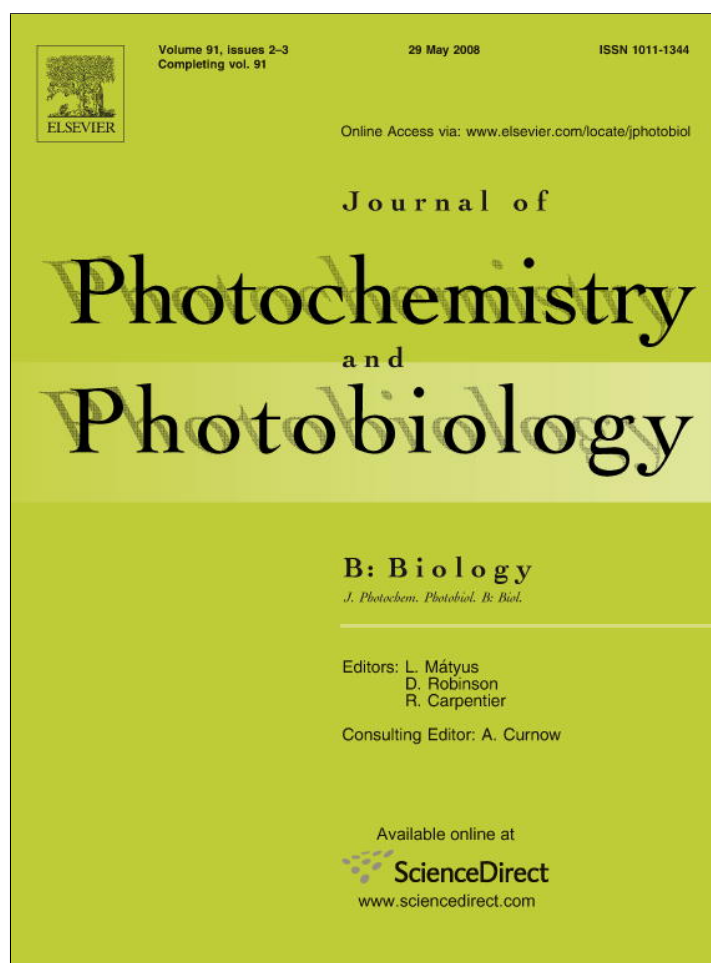


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## Combined effects of solar ultraviolet radiation and nutrients addition on growth, biomass and taxonomic composition of coastal marine phytoplankton communities of Patagonia

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## ABSTRACT

Experiments (6–8 days) were conducted during late summer, late fall and late winter, 2003 with waters collected off Bahía Nueva, Chubut, Argentina (42.7° S, 65° W) to determine the combined effects of solar ultraviolet radiation (UVR, 280–400 nm) and nutrient addition on phytoplankton communities. Samples were put in UVR-transparent containers and incubated under two radiation treatments: (a) Samples exposed to full solar radiation (PAB treatment, 280–400 nm) and (b) Samples exposed only to PAR (PAR treatment, 400–700 nm). At the beginning of the experiments, nutrients (i.e., NaPO<sub>4</sub>H<sub>2</sub> and NaNO<sub>3</sub>) were added to one set of samples from each radiation treatment (N cultures) whereas in the other set, nutrients remained at the concentration of the seawater. Chlorophyll a, biomass, UV-absorbing compounds and taxonomic composition were recorded throughout the experiments. N cultures always had significantly higher growth rates ( $P < 0.05$ ) than that in non-enriched cultures. At the beginning of experiments, phytoplankton communities were generally dominated by monads and flagellates but by the end, diatoms comprised the bulk of biomass, with only one to four taxa dominating, suggesting a selection towards more tolerant/less sensitive species. Over the experimental time frame, the observed taxonomic changes were mostly due to nutrient availability, and to a lesser extent to solar UVR exposure. Overall, the results indicate that environmental conditions (i.e., light history, nutrient concentration) together with the physiological status of the cells play a very important role at the time to assess the combined effect of nutrient addition and solar radiation on coastal phytoplankton assemblages from Patagonia.

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