

In order to gain insights into the effects of solar ultraviolet radiation (UVR, 280–400 nm) on the composition of marine bacterioplankton communities from South Atlantic waters – Bahía Engaño (Patagonia, Argentina), we performed microcosms experiments during the Austral summer of 2010. Water samples were exposed to three solar radiation treatments in 25 L microcosms during 8 days: PAR + UV-A + UV-B (280–700 nm; **PAB** treatment), PAR + UV-A (320–700 nm; **PA** treatment), and PAR only (400–700 nm; **P** treatment). The taxonomic composition of the bacterial communities, at the beginning and at the end of the experiment, were studied by the analyses of 16S rDNA gene libraries. Multivariate and phylogenetic analyses demonstrated substantial differences in the community composition so that the samples exposed to PAR and PAR + UV-A presented more similar taxa assemblages among them than compared to the PAR + UV-A + UV-B exposed one. Our results indicate that overall, exposure to different radiation treatments can shape the taxonomic composition of marine bacterial populations, grown in microcosms, from this Patagonian area.