



Long-term effects of elevated pCO₂ and temperature on microbial abundance and respiration in mesopelagic waters of the NW Mediterranean Sea

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Mesopelagic communities are subject to higher pCO₂ levels than surface ones. Some studies have been performed on the combined effects of elevated pCO₂ and temperature on surface pelagic communities but nothing is known in the mesopelagic zone. We investigated the effects of elevated pCO₂ and temperature on microbial abundance and respiration community composition and related variables in long-term (2 months) experiments with mesopelagic waters (300 m depth) collected off the Bay of Villefranche, NW Mediterranean. Two experiments were conducted with two temperatures (13 and 16°C) and two pCO₂ levels (ambient pCO₂, 400 μ atm; elevated pCO₂, 1000 μ atm). The abundance of viruses, prokaryotes and flagellates were measured together with the concentration of transparent exopolymeric particle (TEP) and microbial respiration. Abundances and TEP concentrations (as far analysed) were not or only slightly affected by the treatments. Microbial respiration increased with temperature and decreased - in one experiment- with elevated pCO₂. The fact that no clear cause-effect relationship could be detected for all treatments could be due to the different communities present at the start of the experiments (see companion abstract by Motegi et al.). Overall, we temperature and pCO₂ changes could affect microbial respiration and that temperature changes had a stronger and more consistent effect.