Ocean acidification alters phytoplankton diversity and community structure in the coastal water of the East China Sea

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Keywords: CO_2, East China Sea, mesocosms; ocean acidification; phytoplankton; primary production

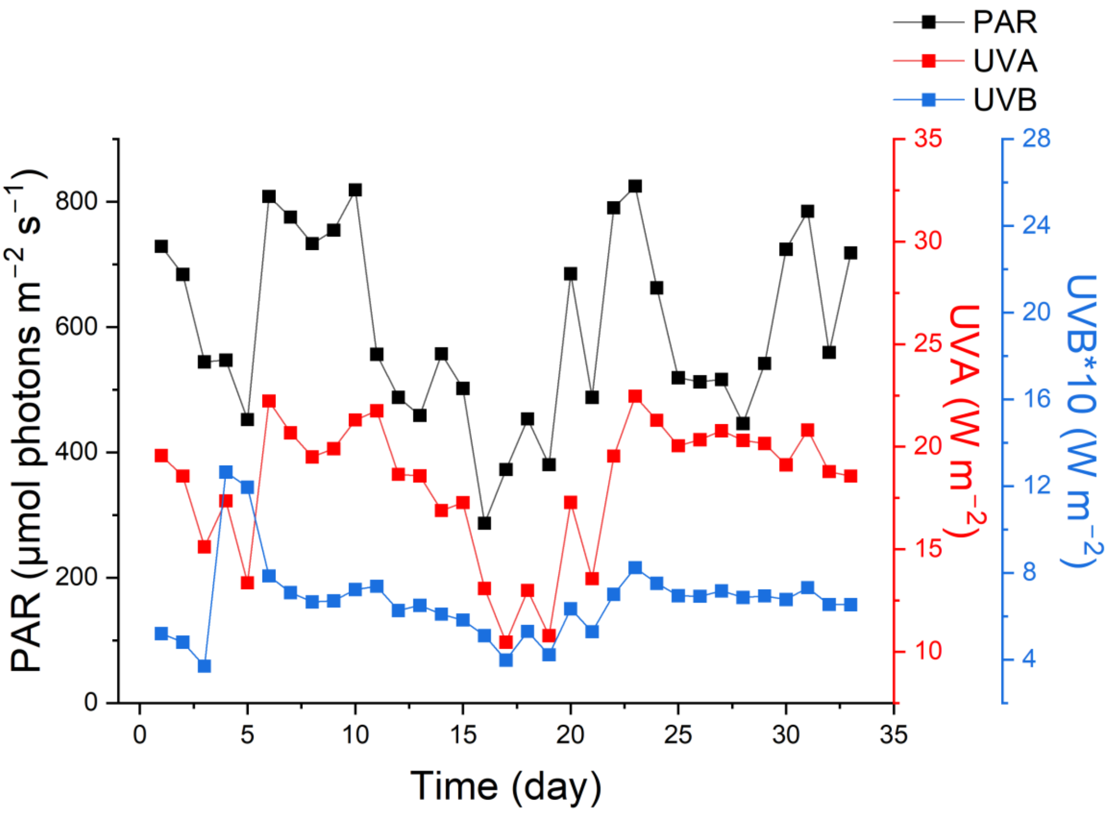

Figure S1. The daily variation of 12h-average photosynthetic active radiation (PAR), ultraviolet A (UVA) and ultraviolet B (UVB) during the mesocosm experiment.

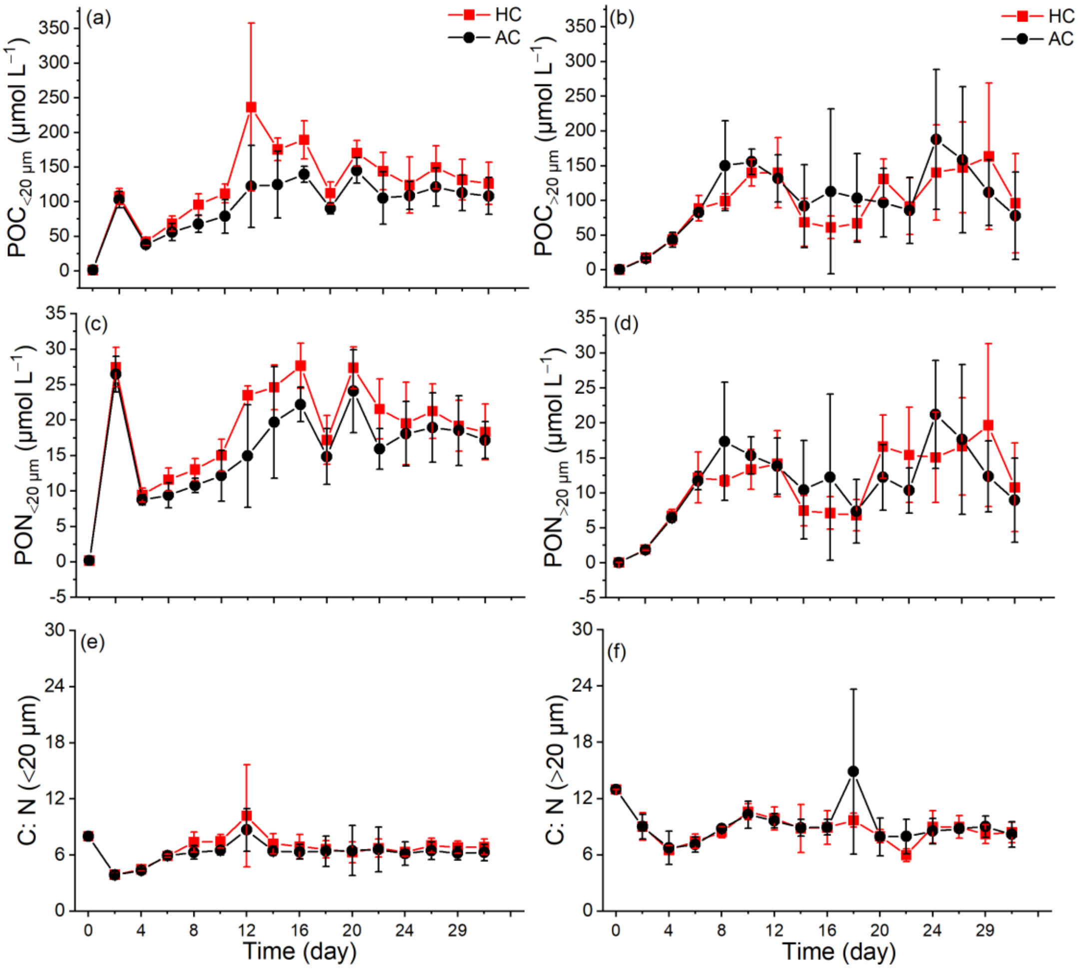

Figure S2. Temporal variations of different size particulate organic carbon (< 20 μm, a; > 20 μm, b), particulate organic nitrogen (< 20 μm, c; > 20 μm, d) and C/N ratio (< 20 μm, e; > 20 μm, f) in HC (1000 μatm) and AC (410 μatm) mesocosms. Data are means ± SD of 5 replicates for HC and 4 replicates for AC mesocosms.

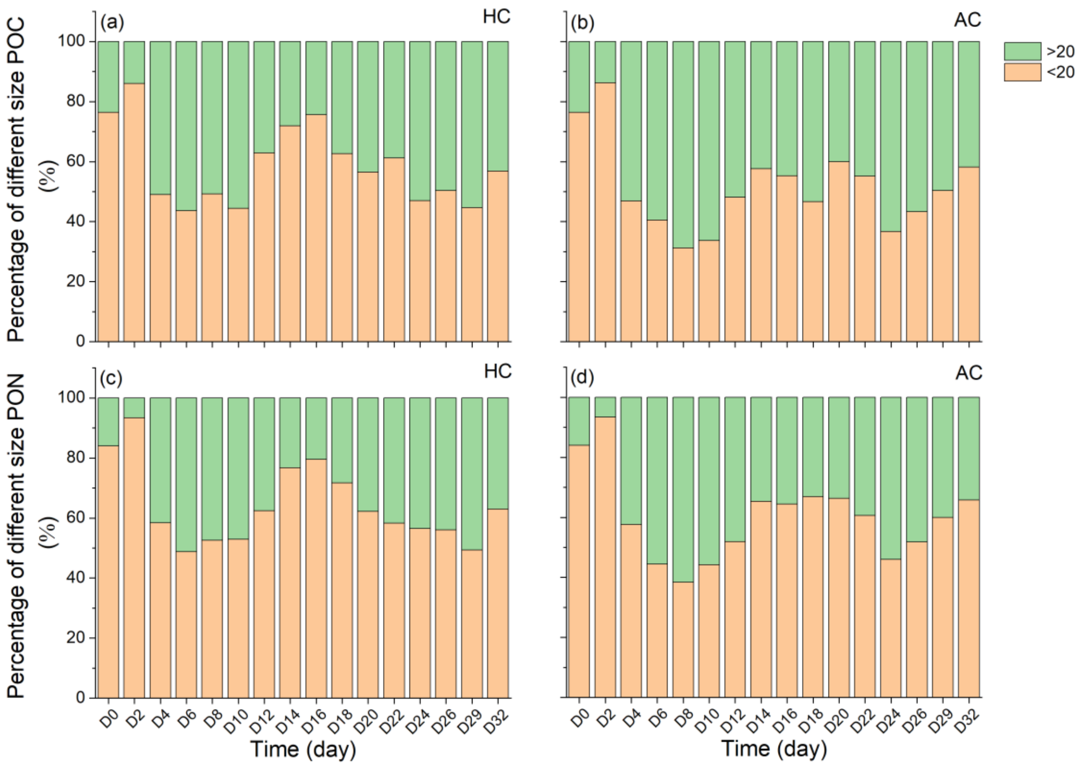

Figure S3. Temporal variations of the relative composition of different size particulate organic carbon (HC, a; AC, b), particulate organic nitrogen (HC, c; AC, d) in HC (1000 μatm) and AC (410 μatm) mesocosms. Data are means of 5 replicates for HC and 4 replicates for AC mesocosms.

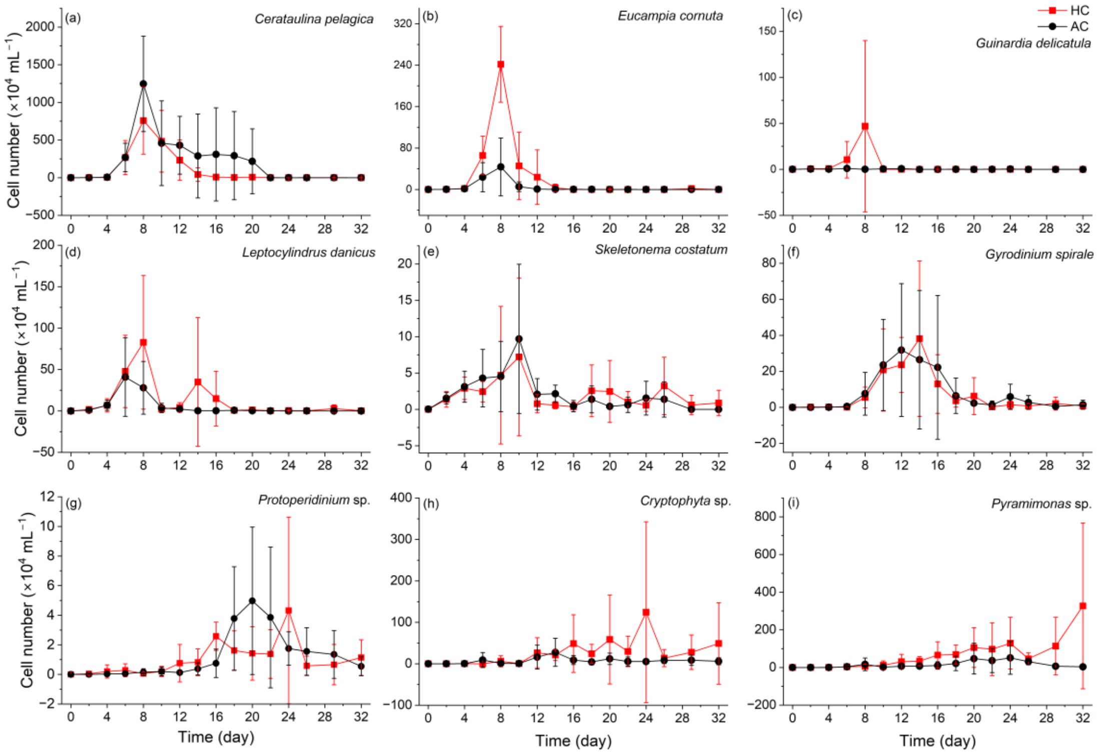

Figure S4. Temporal variations of different dominant species in HC (1000 µatm) and AC (410 µatm) mesocosms. Data are means ± SD of 5 replicates for HC and 4 replicates for AC mesocosms.

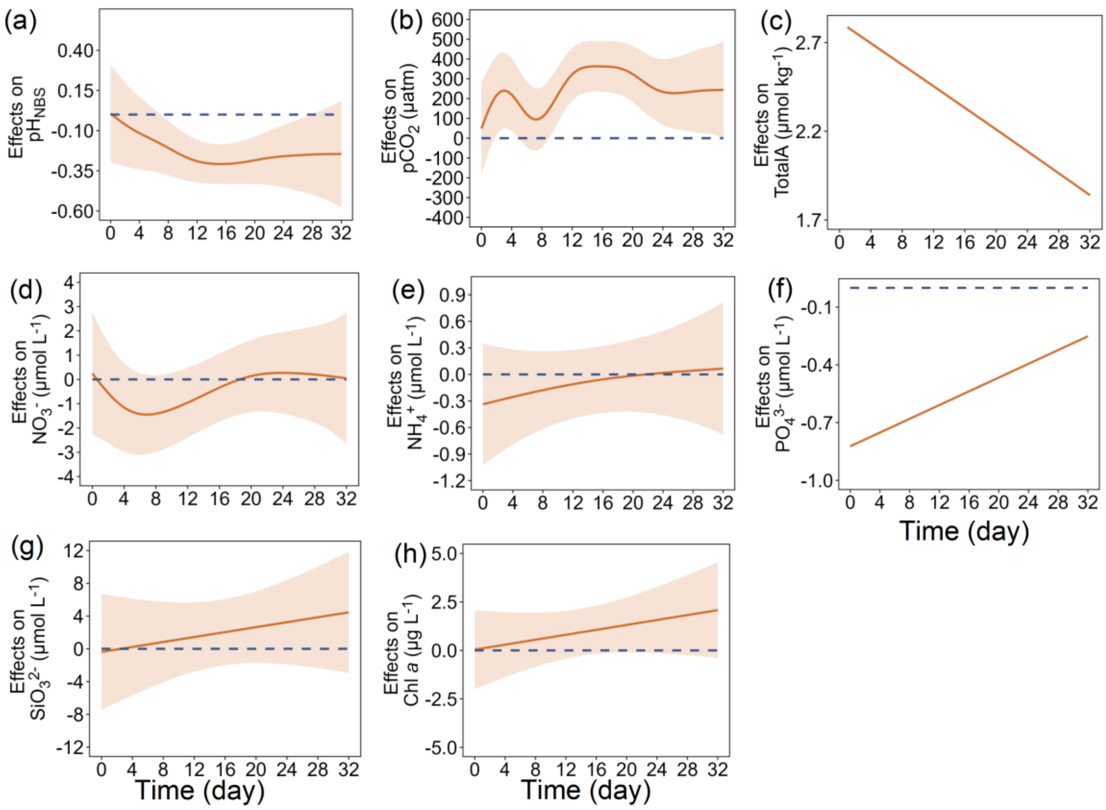

Figure S5. GAMM analyses of the effect of HC on (a) pH_{NBS}, (b) pCO_2, (c) Total alkalinity (TA), (d) NO_3^- concentration, (e) NH_4^+ concentration, (f) PO_4^{3-} concentration, (g) SiO_3^{2-} concentration and (h) Chl *a* concentration. Solid lines and shadows are predicted values with 95 % confidence intervals.

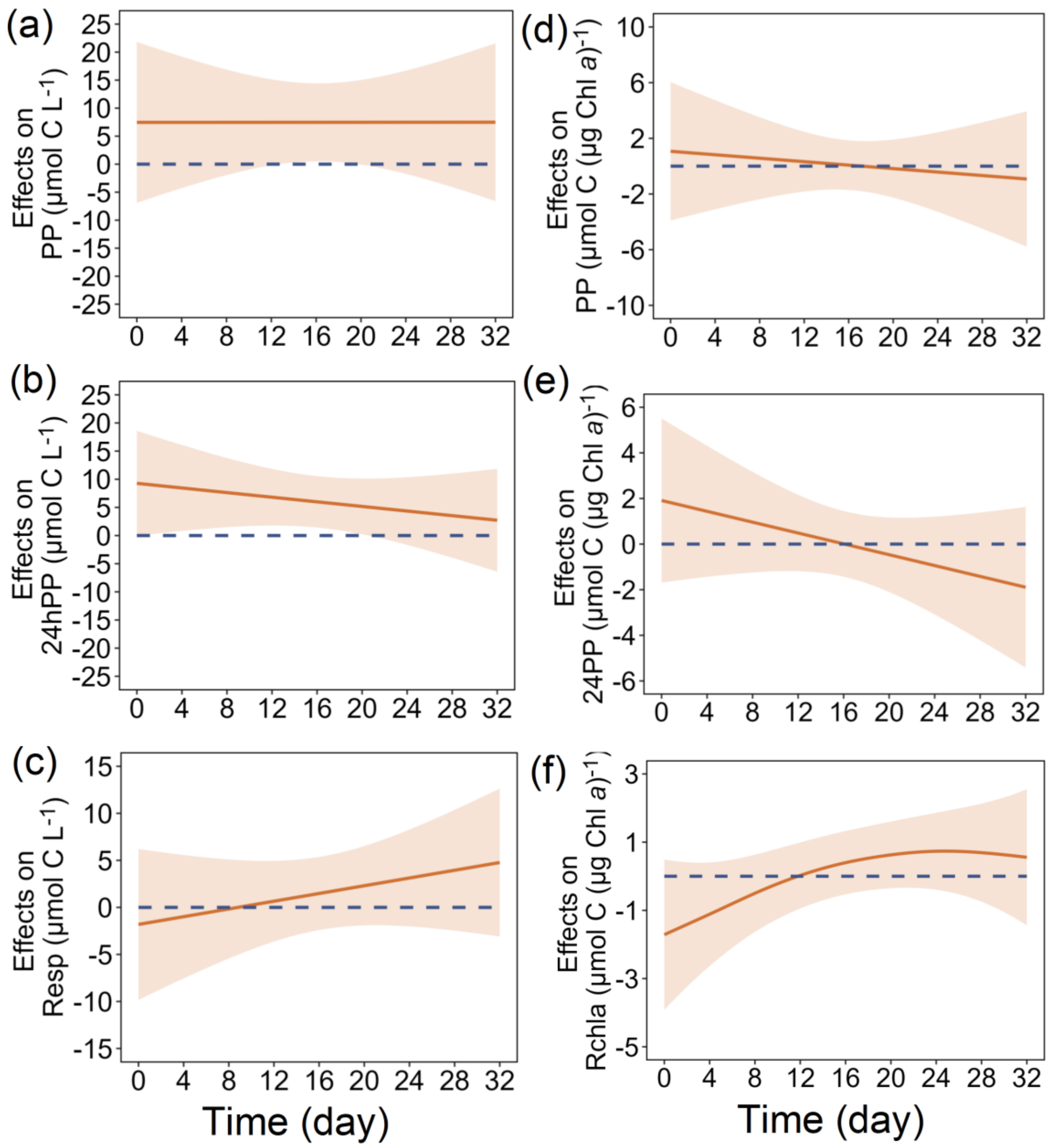

Figure S6. GAMM analyses of the effect of HC on (a) daytime primary production (PP) and (b) daytime primary productivity, (c) 24 h primary production and (d) 24 h primary productivity, dark respiration per water volume (e) and per Chl *a* (f). Solid lines and shadows are predicted values with 95 % confidence intervals.

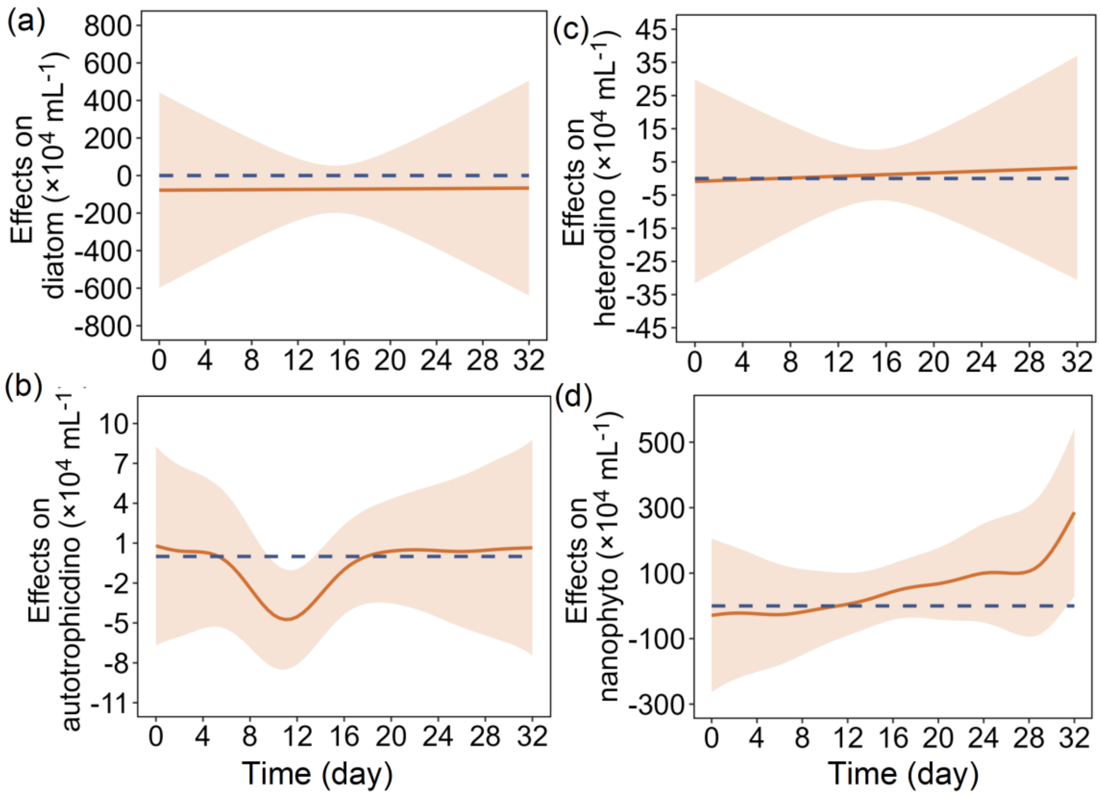

Figure S7. GAMM analyses of the effect of HC on (a) diatom biomass, (b) autotrophic dinoflagellate biomass, (c) heterodinoflagellate biomass and (d) nanophytoplankton (Cyanobacteria, Chlorophyta, Cryptophytes, Euglenophyta) biomass. Solid lines and shadows are predicted values with 95 % confidence intervals.

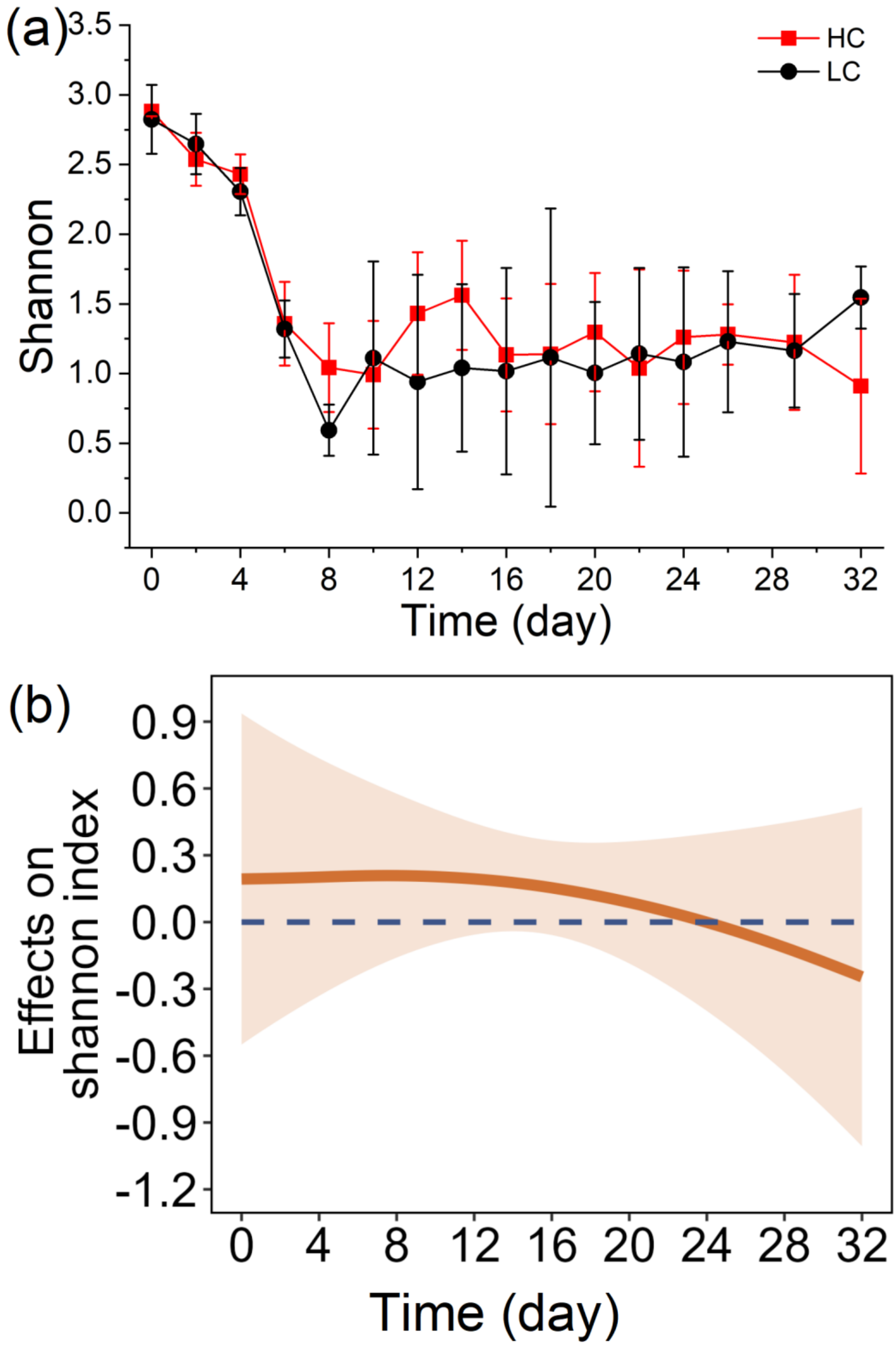

Figure S8. Shannon diversity index (a) and GAMM analyses of the effect of HC on Shannon diversity index (b). In panel a, data are means ± SD of 5 replicates for HC and 4 replicates for AC mesocosms. In pane b, solid lines and shadows are predicted values with 95 % confidence intervals.

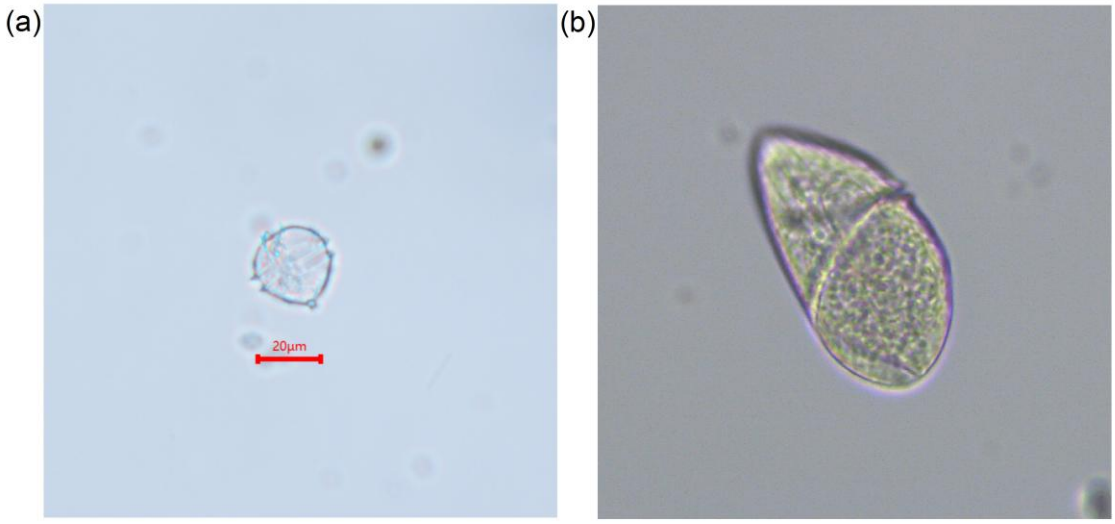

Figure S9. Living algal cells in unstained water samples under 40× microscope. (a) *Protoperidinium* sp.; (b) *Gyrodinium spirale*.