Supplementary material

Ocean Alkalinity Enhancement does not cause cellular stress in phytoplankton in a mesocosm experiment.

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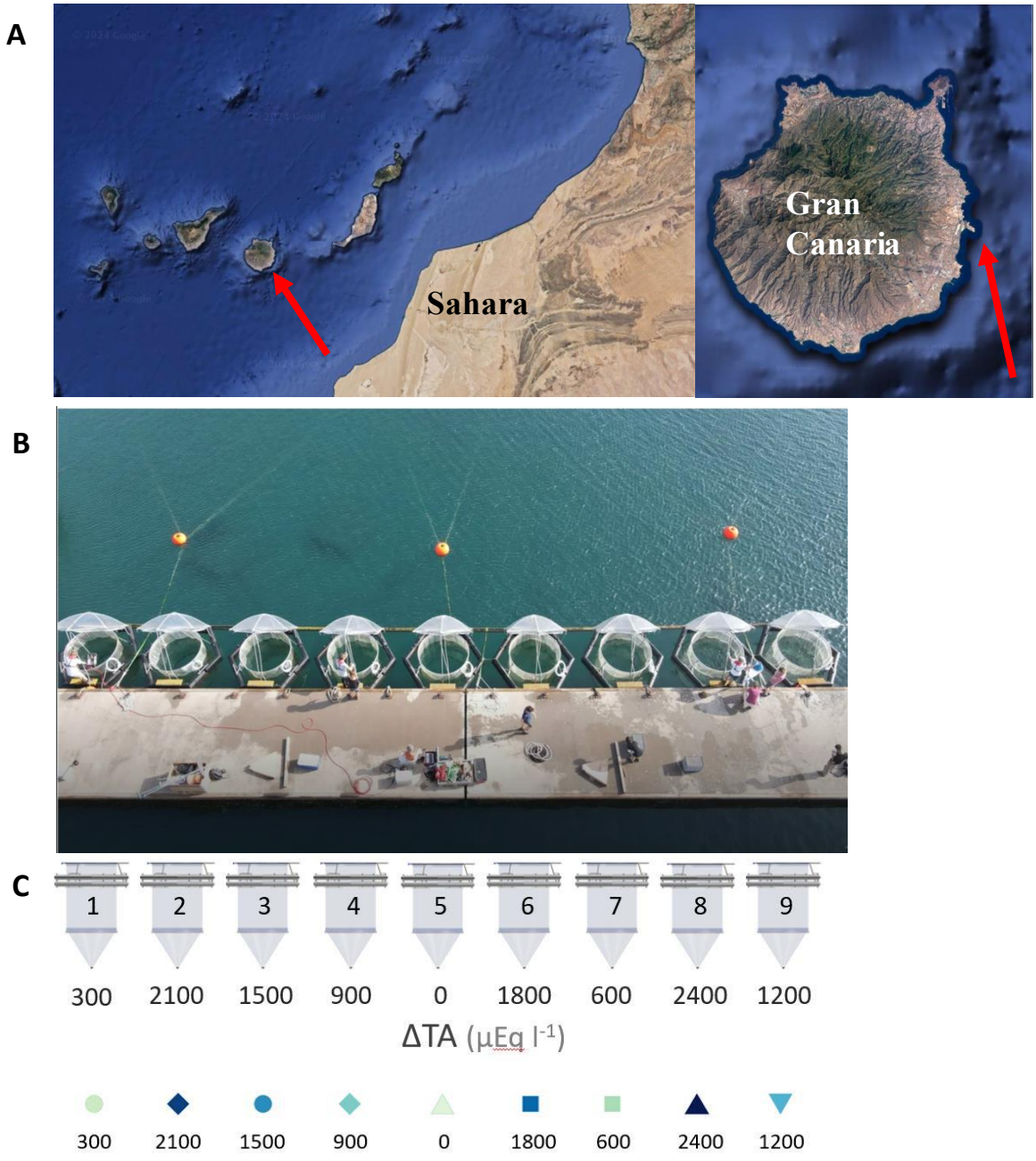

Figure S1. A) Study site in the port of Taliarte, Gran Canaria (Spain). B) Operating mesocosms during the experiment (photograph by Peter Yeung, National Geographic ©). C) Mesocosms experimental design representing the alkalinity gradient (OAE) (µmol·L-1) in the nine mesocosms: M5 (0), M1 (300), M7 (600), M4 (900), M9 (1200), M3 (1500), M6 (1800), M2 (2100), M8 (2400) (design by Silvan Goldenberg ©, GEOMAR).

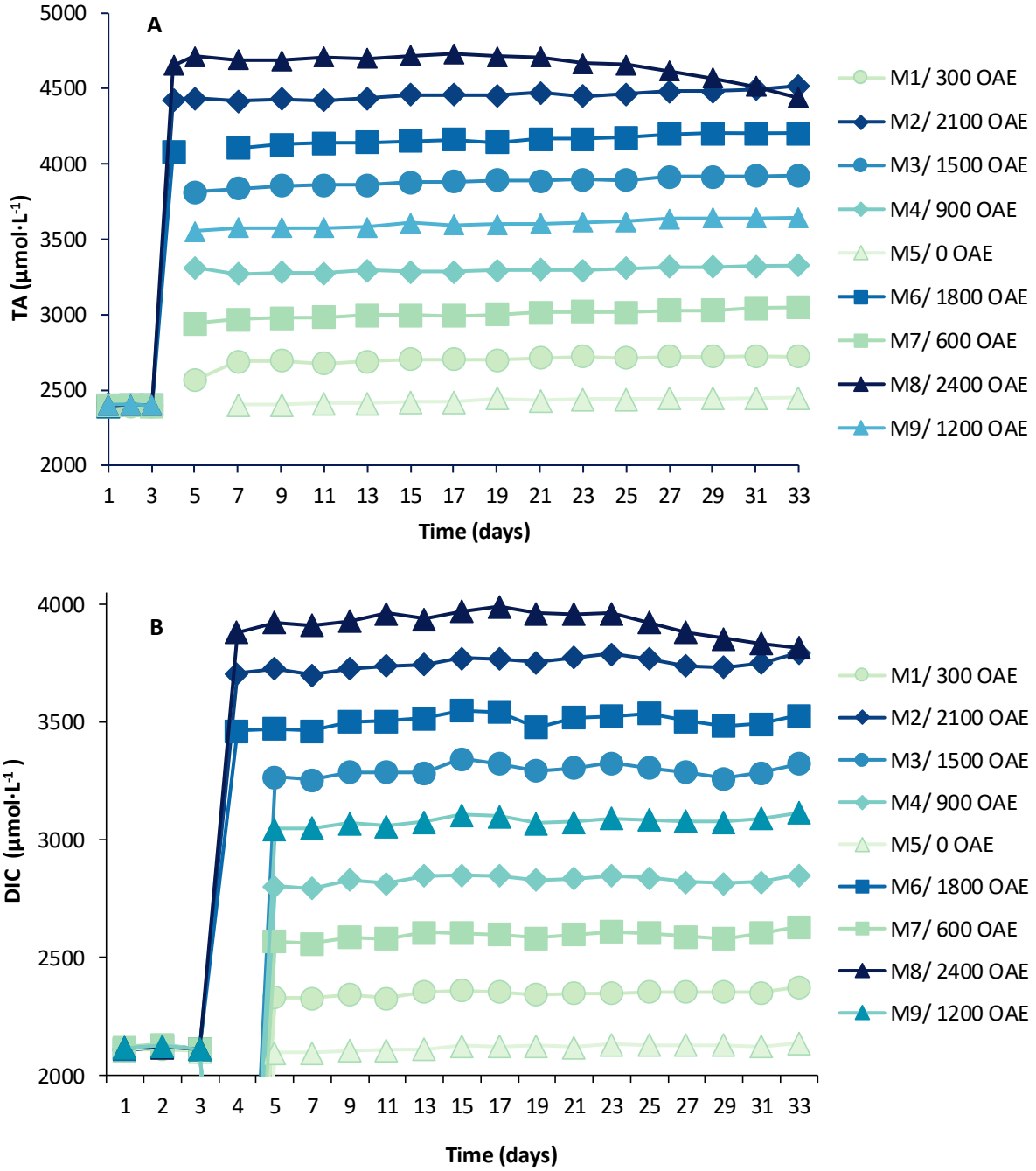

Figure S2. A) Evolution of total alkalinity (TA) (µmolL^{-1}); and B) dissolved inorganic carbon (DIC) (µmol·L^{-1}) over time during the mesocosms experiment. Reproduction with permission of *Biogeosciences , Marin -Samper et al. 2024.*

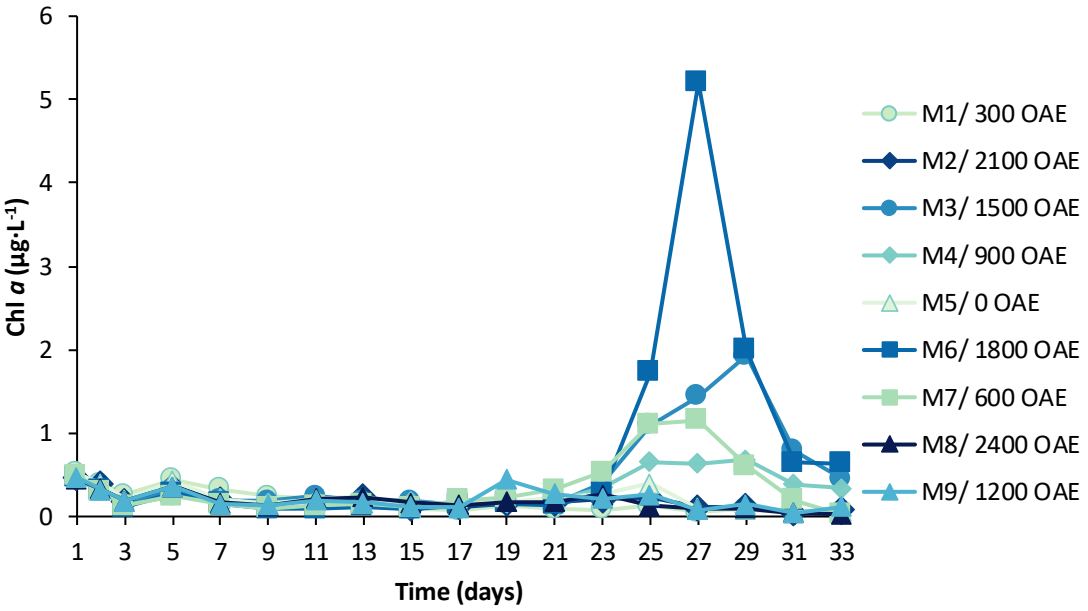

Figure S3. Temporal evolution of chlorophyll-*a* concentration in µg·L^{-1} during the mesocosms experiment. Reproduction with permission of *Biogeosciences , Marin -Samper et al. 2024.*

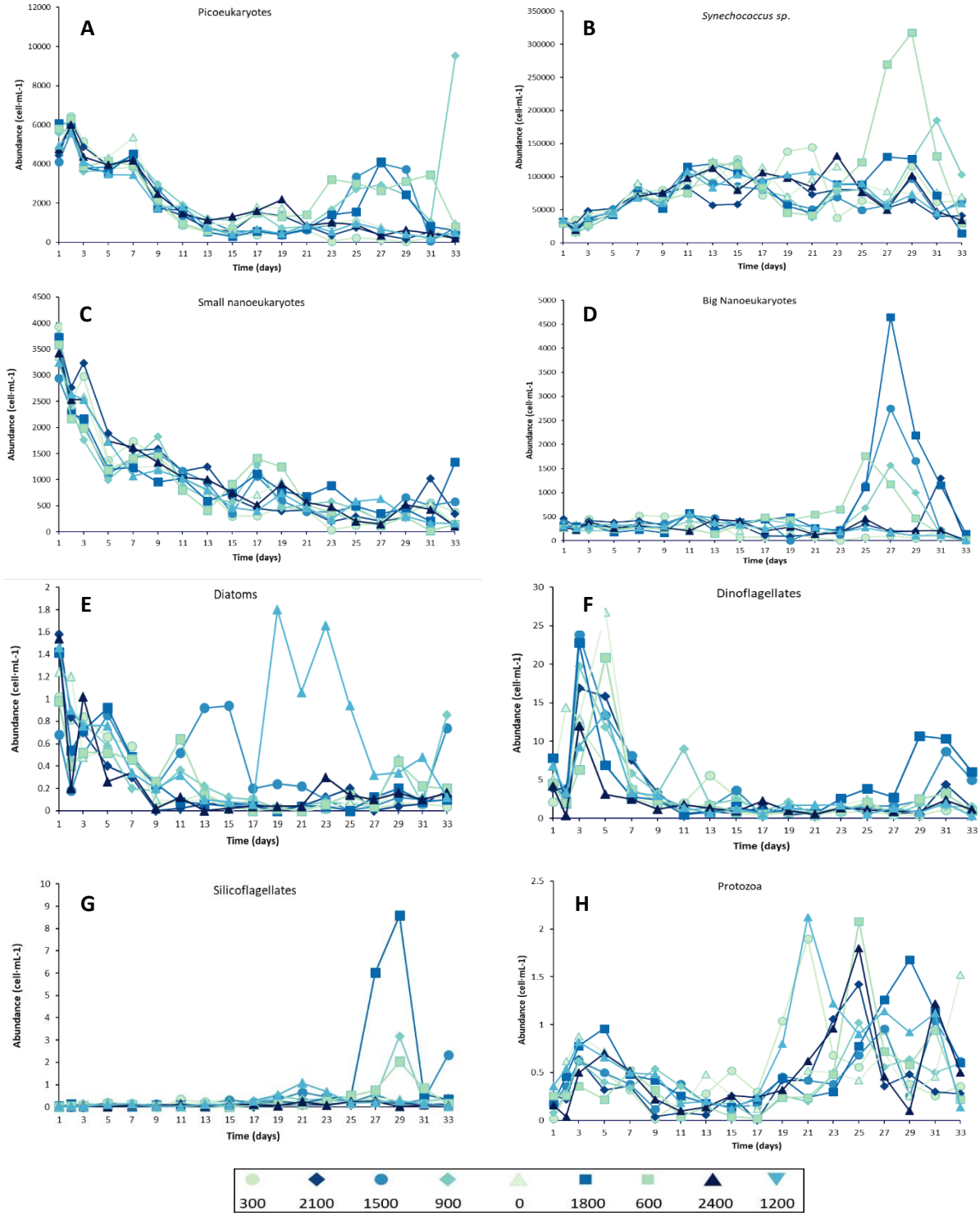

Figure S4. Cell abundance of phyto- and microphytoplankton in cell·ml^{-1}. A) Picoeukaryotes <2 µm; B) Synechococcus spp. < 2 µm,;C) Small nanoeukaryotes 2-20 µm; D) Large nanoeukaryotes >20 µm; E) Diatoms; F) Dinoflagellates; G) Silicoflagellates; H) Protozoa. Reproduction in with permission of *Biogeosciences , Marin -Samper et al. 2024 for A to D.*

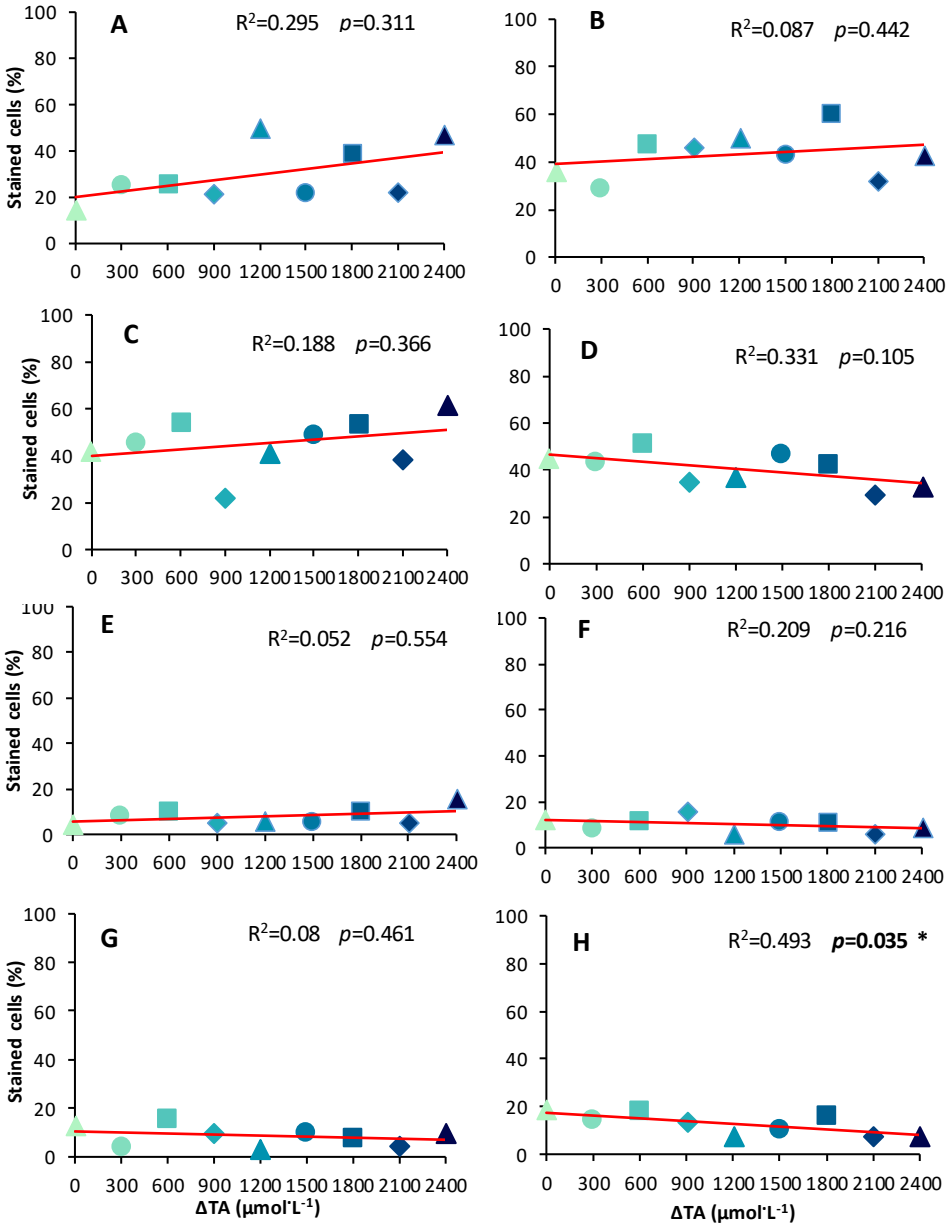

Figure S5. Linear regressions among the percentage of stained cells and OAE treatments in picoeukaryotes and *Synechococcus spp*. A) Cell viability (FDA) in picoeukaryotes in phase I; B) Cell viability in picoeukaryotes in phase II; C) Oxidative stress (ROS) in picoeukaryotes in phase I; D) Oxidative stress in picoeukaryotes in phase II; E) Cell viability in *Synechococcus* in phase I; F) Cell viability in *Synechococcus* in phase II; G) Oxidative stress in *Synechococcus* in phase I; H) Oxidative stress in *Synechococcus* in phase II.

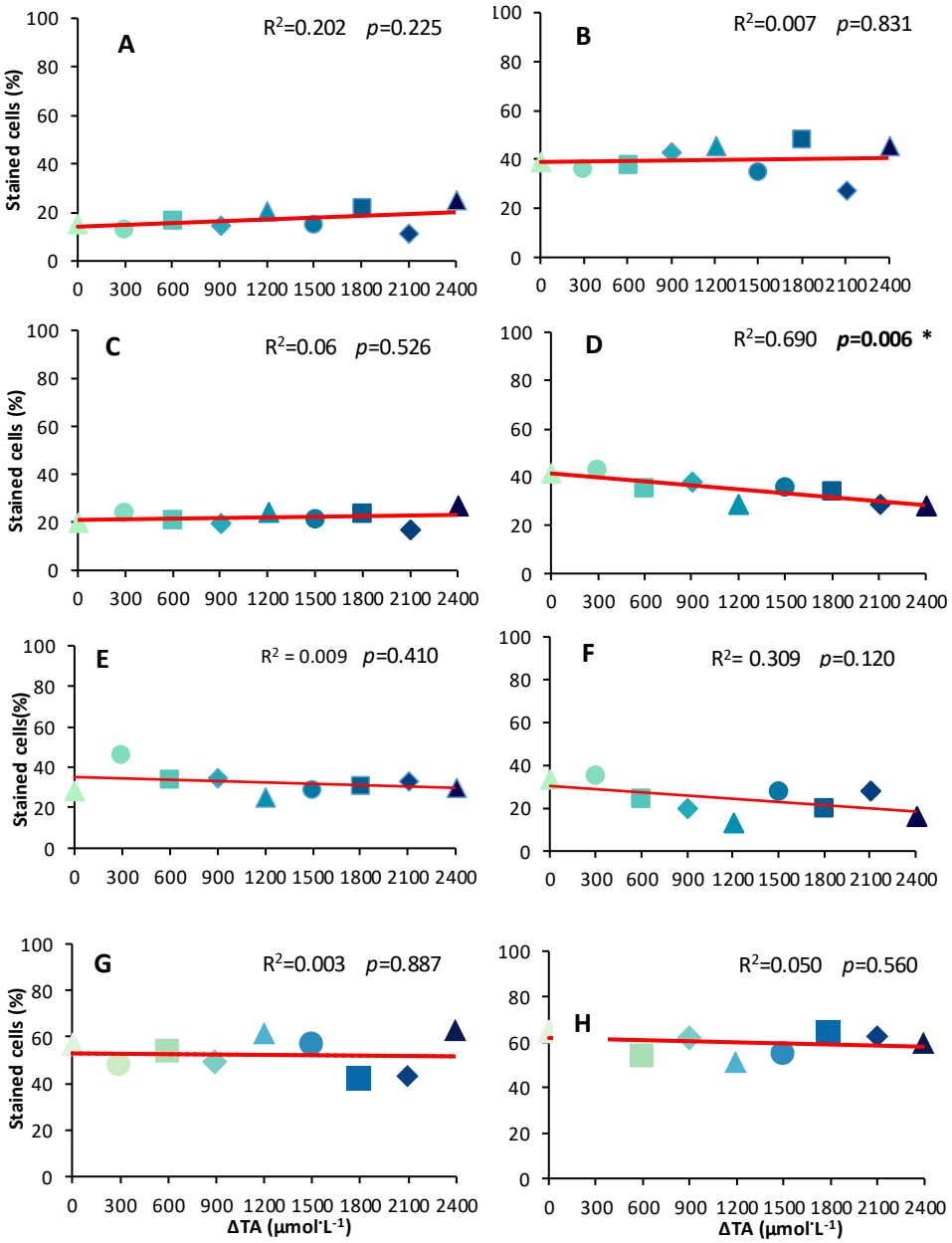

Figure S6. Linear regressions among the percentage of stained cells and OAE treatments in small nanoeukaryotes (20 µm) and big nanoeukaryotes (>20 µm). A) Cell viability (FDA) in small nanoeukaryotes in phase I; B) Cell viability in small nanoeukaryotes in phase II; C) Oxidative stress (ROS) in small nanoeukaryotes in phase I; D) Oxidative stress in small nanoeukaryotes in phase II; E) Cell viability in big nanoeukaryotes in phase II; F) Oxidative stress in big nanoeukaryotes in phase II; G) Cell viability in microphytoplankton in phase II; H) Oxidative stress in microphytoplankton in phase II.

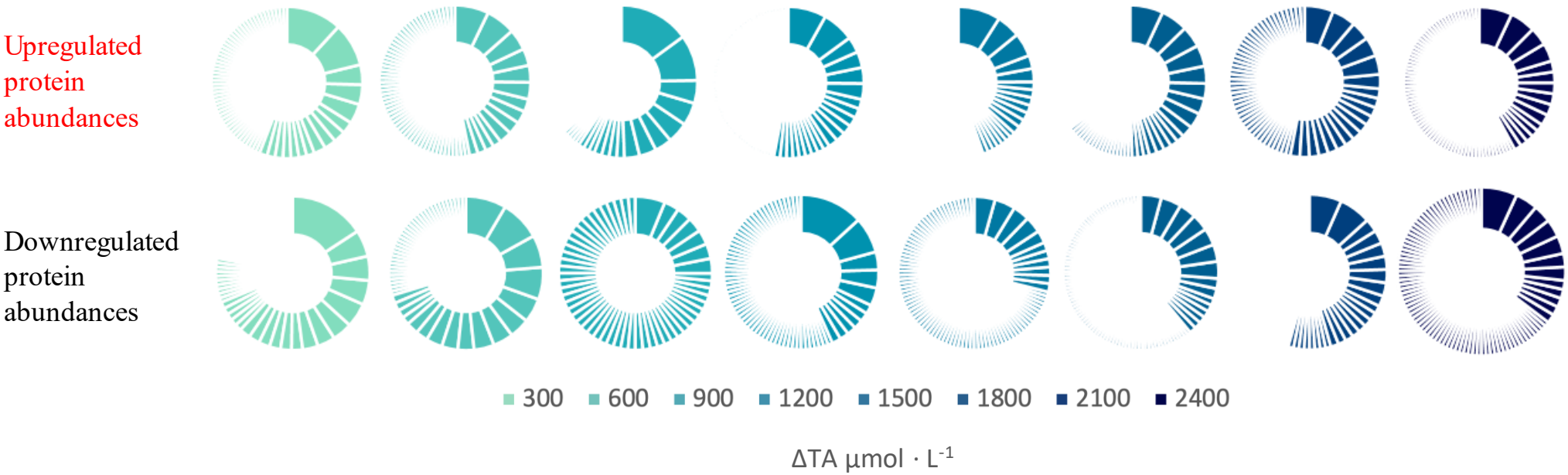

Figure S7. Ring-Sector plots categorized by absolute abundances of significantly upregulated and downregulated protein abundances normalised to ΔTA 0 µmol· L^{-1} and housekeeping proteins. By ring-around each sector, the protein that has changed its abundance will appear, attending to its contribution amongst all the up/down-regulated dataset.