

Environmental Drivers and Key Taxa Shaping Diatom-Dinoflagellate Ratios in Eutrophic Coastal Waters

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Supplementary material

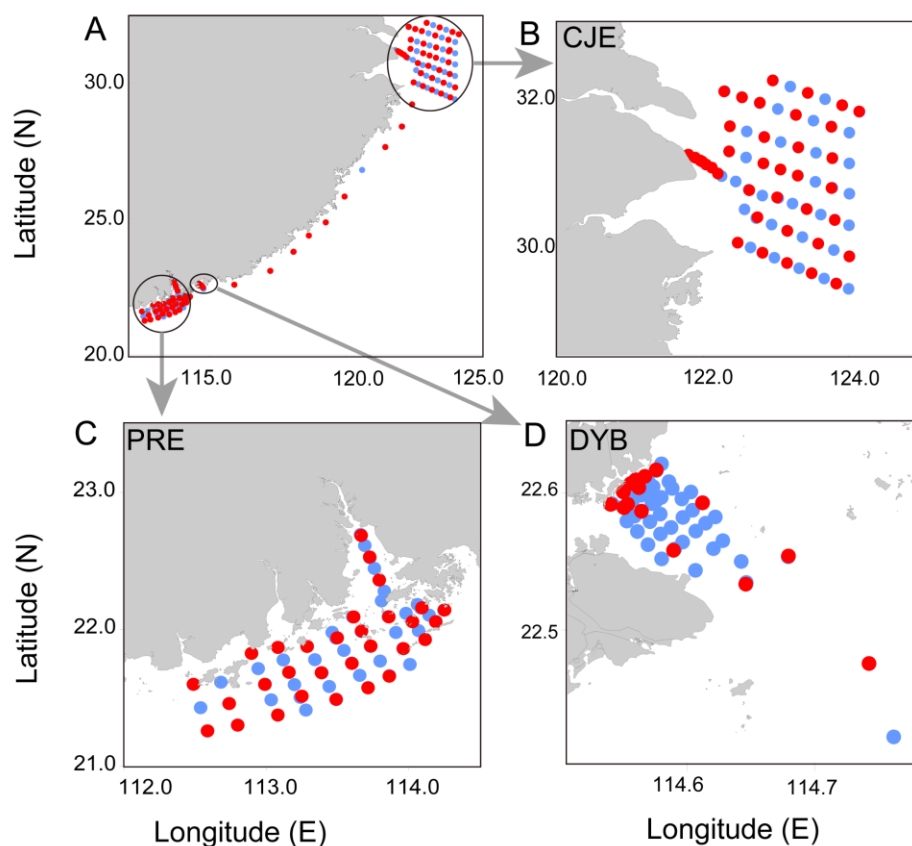


Fig. S1. The distribution of sampling stations across the study area, mapped using Surfer 23. (A) Full survey area, (B) Changjiang River estuary (CJE) and adjacent coastal waters, (C) Pearl River estuary (PRE) and adjacent waters, and (D) Daya Bay (DYB). A total of 95 sampling stations were established, where environmental parameters including temperature (Tem), salinity (Sal), dissolved oxygen (DO), ammonium (NH_4^+), nitrate (NO_3^-), nitrite (NO_2^-), phosphate (PO_4^{3-}), and silicic acid ($\text{Si}(\text{OH})_4$) were measured. The solid red dots indicate stations where quantitative PCR was performed (91 stations) and 18S sequencing was conducted (92 stations). The basemap shows a simplified coastline for visual clarity and does not represent national boundaries.

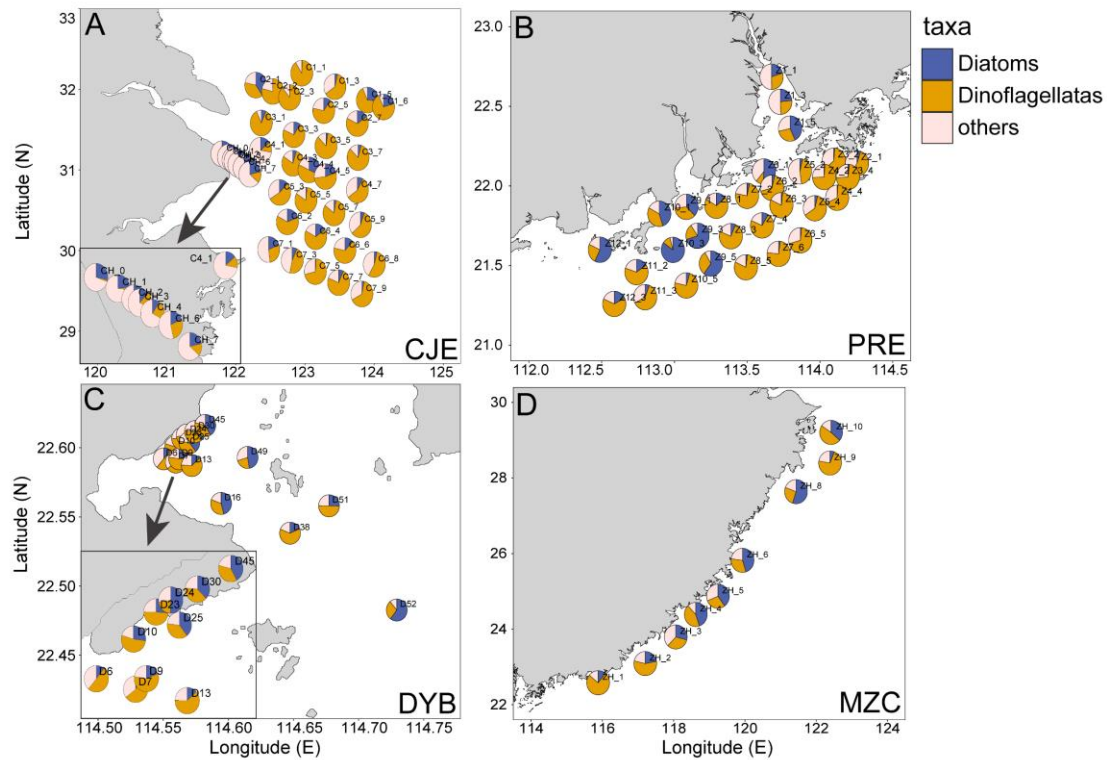


Fig. S2. Relative abundances of diatoms and dinoflagellates in microeukaryotic plankton communities in the coastal seas of China. (A) Changjiang River estuary (CJE) and adjacent coastal waters, (B) Pearl River estuary (PRE) and adjacent waters, (C) Daya Bay (DYB), and (D) the coastal waters off Fujian and Zhejiang provinces (MZC). The map shows a simplified coastline for visual clarity and does not represent national boundaries. The maps were generated using R package scatterpie.

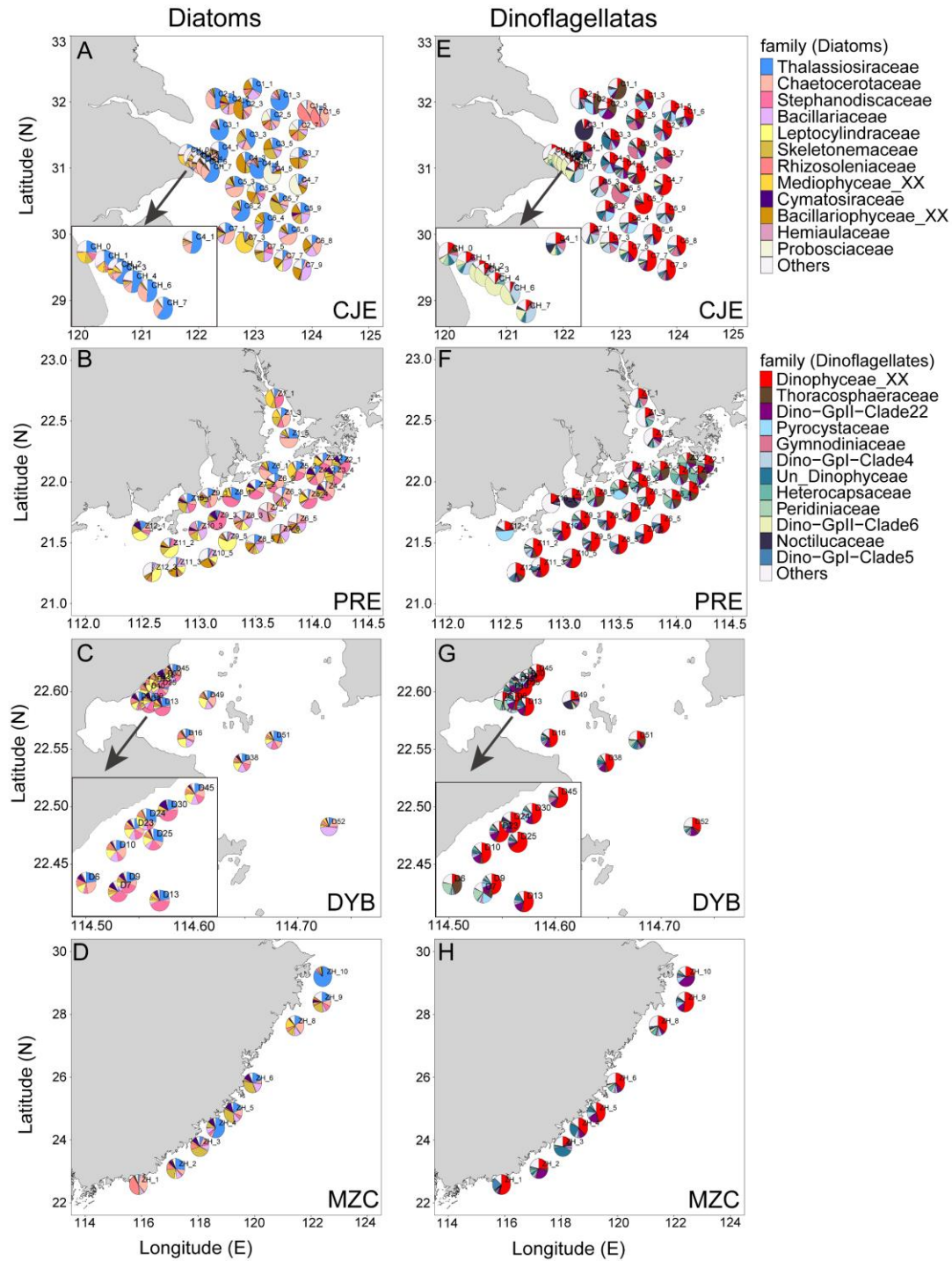


Fig. S3. Relative abundances of diatom and dinoflagellate families in the diatom or dinoflagellate communities in the coastal seas of China. (A-D) Diatoms. (E-H) Dinoflagellates. (A, E) Changjiang River estuary and adjacent coastal waters, (B, F) Pearl River estuary and adjacent waters, (C, G) Daya Bay, and (D, H) the coastal waters off Fujian and Zhejiang provinces. The maps were generated using R package scatterpie.

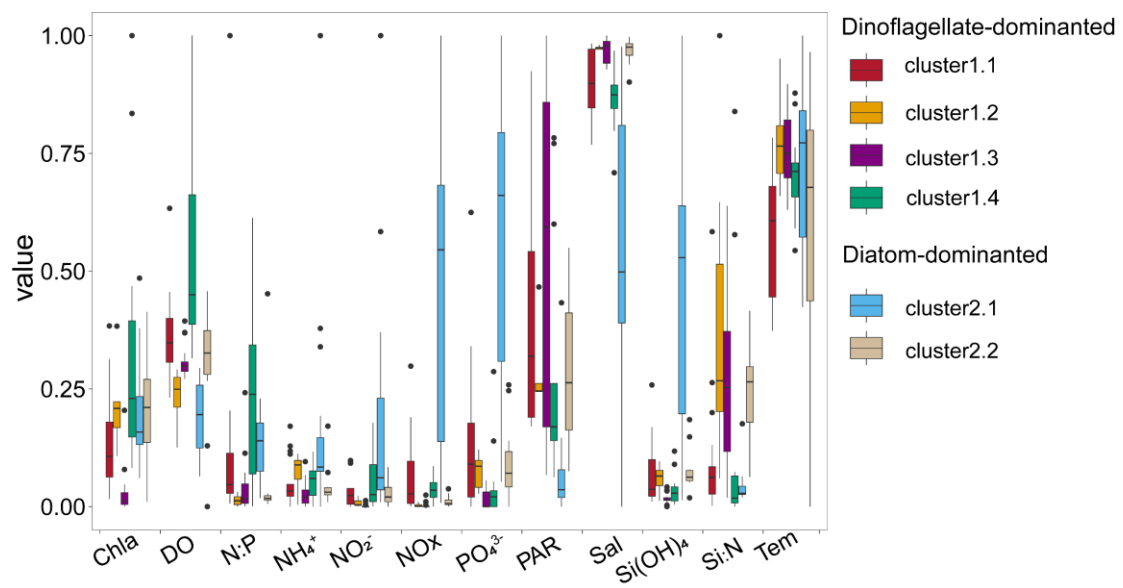


Fig. S4. Comparative analysis of environmental parameters across different clusters. Environmental data normalized using maximum-minimum normalization.

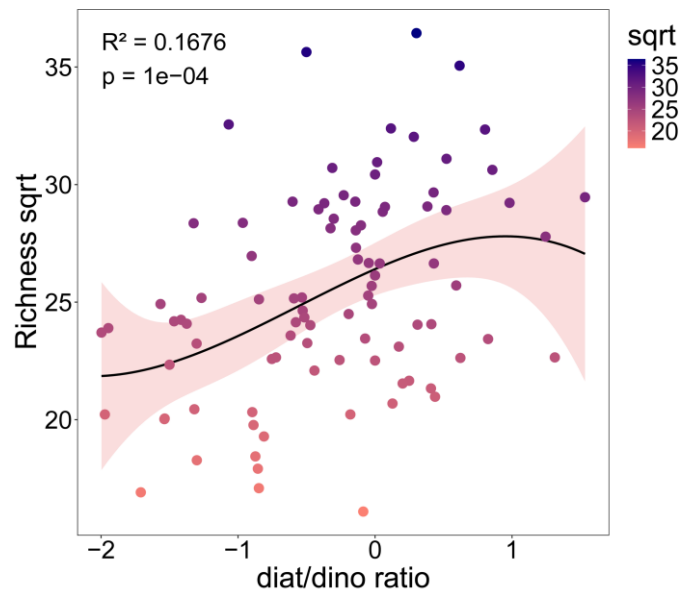


Fig. S5. The relationship between the diat/dino ratio and overall phytoplankton species richness. The $\log_{10}$ -transformed diat/dino ratio and square root-transformed richness index were fitted using a cubic polynomial regression model. The shaded areas represent the 95% confidence intervals.

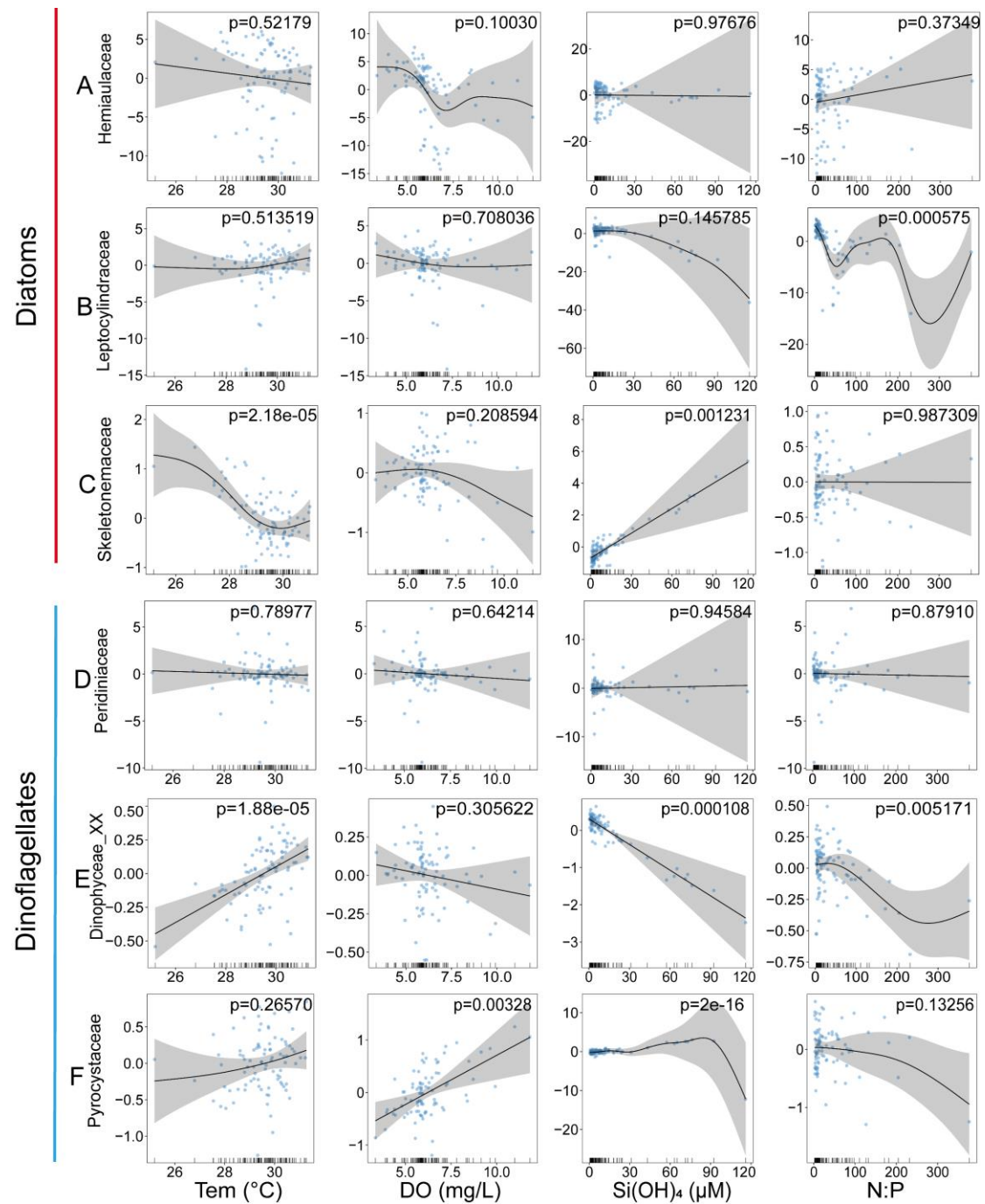


Fig. S6. GAMs reveal partial effects of the temperature, DO, Si(OH)₄ and N:P ratio on relative abundance of key families (log₁₀-transformed). (A) Hemiaulaceae, (B) Leptocylindraceae, (C) Skeletonemaceae, (D) Peridiniaceae, (E) Dinophyceae_XX, and (F) Pyrocystaceae. The shaded areas represent the 95% confidence intervals, and the marks on the x-axes represent the distribution of the observed data.