Diatom assemblages vary with the environmental factors even within an area of a river mouth tidal flat

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This study represents a relationship between environmental factors and diatom distribution at river mouth tidal flat sediments. Sediment samples were collected from 25 sites within a selected area of 14400 m^2 at Fujimae Tidal Flat, Nagoya, Japan, in July 2014. We measured grain size distribution and distance from the river mouth, and determined concentrations of carbon, nitrogen, phosphorous, iron, zinc, and chlorophyll-*a* in the sediments, and concentrations of phosphate, ammonium, and salinity in the pore waters. We identified and counted only living diatoms by using a nuclear-staining preparation method. Redundancy analysis (RDA) were performed for displaying the relationship between diatom assemblages and environmental factors. Generalized linear models (GLMs) were also applied for detecting the effect of environmental factors on distribution of each species. Fourteen taxa that exhibited frequency of appearance over 0.5 % were employed for these analyses. Because salinities of the pore waters have changed with time, we did not employ it for these analyses.

The RDA showed that diatom assemblage was mainly changed along the distance from the river mouth. The results of the GLM analyses and the species distribution map indicate that epipsammic diatoms which firmly attached to the sand grains were transported with sand, while epipelic diatoms which were motile and loosely attached to the sediments were distributed by the river inflow or ebb. Planktonic diatoms appear to be related to fluctuation of salinity. One of the predominant species *Staurophora dubitabilis* shows positive correlation with carbon and iron concentrations in the sediments. *Navicula arenaria* var. *rostellata* exhibits positive correlation with phosphate concentration in the pore water. This study suggested that diatom assemblage and species distribution varied depending on the local differences of environmental factors affected by inflow of three rivers in this area.