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#### **ACCEPTED MANUSCRIPT**

# Inter-annual and seasonal variations of phytoplankton community and its relation to water pollution in Futian Mangrove of Shenzhen, China

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#### **Abstract**

Inter-annual and seasonal variations of a phytoplankton community over a 5-year period (2008-2012) were studied in Futian Mangrove in Shenzhen, China, in relation to the influence of water pollution. A total of 324 phytoplankton taxa belonging to 8 phyla were identified, of which 233 were Bacillariophyta, followed by 50 Chlorophyta, 18 Cyanophyta, 11 Pyrrophyta, 6 Euglenophyta, 3 Cryptophyta, 2 Xanthophyta, and 1 Chrysophyta. The abundance of phytoplankton ranged from  $3.86 \times 10^4$  to  $5.20 \times 10^8$  cells/L and averaged  $1.94 \times 10^7$  cells/L. Phytoplankton diversity fluctuated seasonally and inter-annually, and species numbers showed a decreasing tendency from 124 species in 2008 to 89 species in 2012. Phytoplankton was numerically dominated by *Cyclotella atomus*, *Conticribra weissflogii* and *Skeletonema* spp. with relative abundance of 42%, 22.8% and 15.8%, respectively. Phytoplankton community changed with the variation of physicochemical factors. Results of canonical correspondence analysis showed that physicochemical variables, including total phosphate, temperature and salinity, were the most important factors influencing the variation of phytoplankton community structure. It is suggested that sewage flow found in the mangrove is the most plausible explanation for increased

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