



The survival strategies of the *Potamogeton Malaianus* in a eutrophicated lake, China

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Macrophytes play a key role in the ecology of shallow lakes, and, subsequently, affect the ecosystem service and economic value of lakes. Quantifying the biomass is necessary for monitoring the ecosystem changing in the fresh water along the climate change. High biomass would increase the photosynthesis competition with the algae in the eutrophicated or turbid lakes and accumulate nutrients efficiently. Therefore, the aquatic vegetation biomass is one of the vital factors to evaluate the ecological state or the calculation of plant purification rate in lakes. *Potamogeton malaianus* Miq.(PM) is among the dominant submerged species with the highest biomass in Lake Taihu to date while other species disappeared or extinct in the past 50 years due to the water pollution combined with anthropologic activities. In order to explain how this species adapted to the changing water environment in the lake, two field studies on the macrophytes especially PM as well as the environmental factors were undertaken in the lake in the growth season from 2010 to 2016. The biomass of leaf, stem and root of PM as well as living conditions such as water depth and sediment physics & chemistry were measured in situ and lab. Compared with the historical biomass records of PM, we found that the increasing biomass contributes most to its dominant role in the lake. Among the different parts of PM, leaf contributes 55-80% of the total plant biomass. Positive relationship exists between the stem height/biomass and water depth. The ecophysiology of PM and physiographic conditions contribute together for the dominant role of PM in the eutrophicated lake. The results also indicate that the pattern of the aquatic communities will change dramatically with the anthropological activities and global climate change. The PM probably will be the sole dominant species in the coming 30 years.

Keywords: *Potamogeton malaianus*; survival strategies, biomass; N:P ratio; water depth