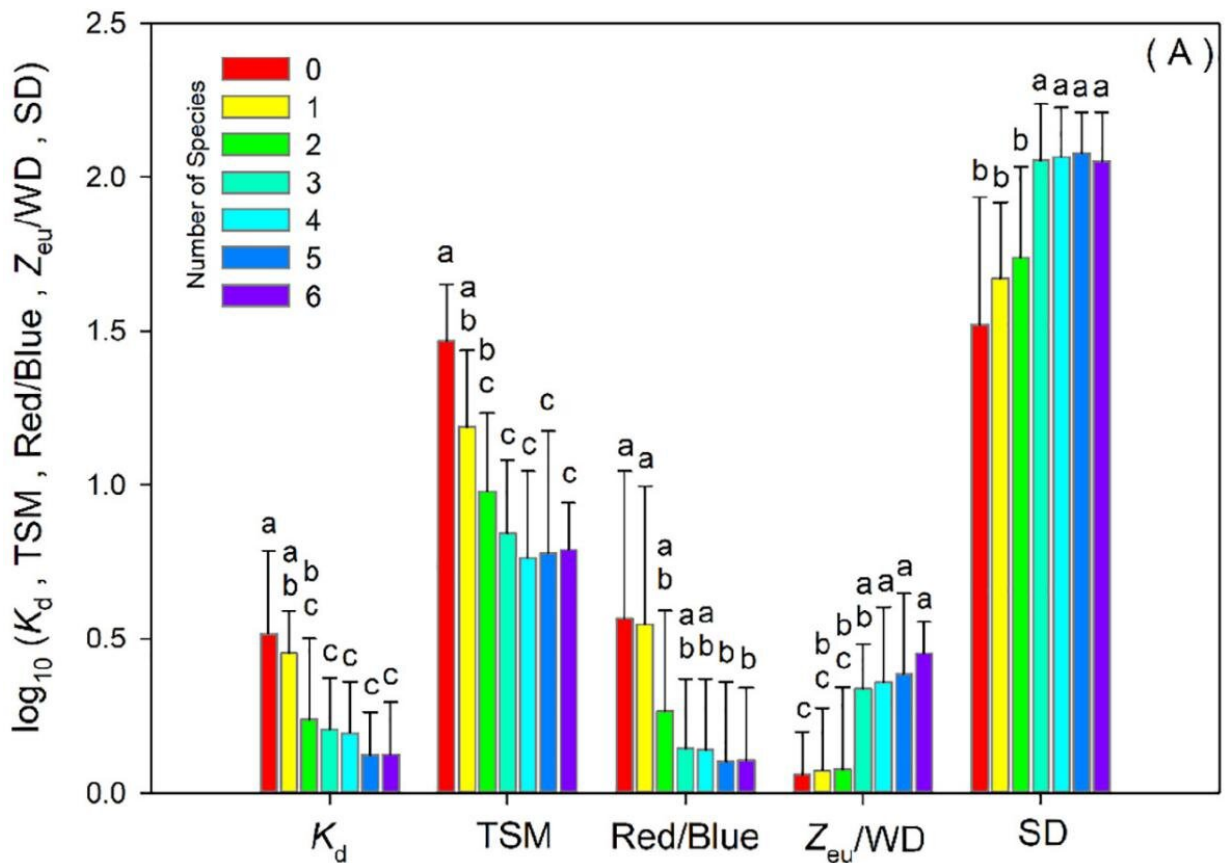


# Study: Biodiversity in stagnant shallow lakes cramps growth of aquatic plants

June 17 2020, by Zhang Nannan



Underwater light field characteristics ( $K_d$ , TSM, Red/Blue,  $Z_{eu}/WD$ , SD) under the presence of different species richness. Credit: WBG

The recovery and long-term maintenance of submerged macrophytes is

the key to the restoration of the ecosystem in eutrophic lakes, because submerged macrophytes can promote the transformation of lake ecosystem from algae-type turbid water steady state to grass-type clear water steady state through construction functions.

Some pioneering species are selected for the [restoration](#) of submerged macrophytes in eutrophic lakes, such as *Myriophyllum spicatum*, *Ceratophyllum demersum*, *Stuckenia pectinata*, *Vallisneria natans*, and *Potamogeton wrightii*. However, the optimal species richness and assemblage is still unclear.

In order to solve the problem through field data, doctoral student Liu Han, under the supervision of Prof. Liu Guihua and Prof. Xing Wei from the Wuhan Botanical Garden, has investigated the submerged vegetations and environment factors of 19 shallow lakes in the mid-lower reaches of the Yangtze River.

The [water](#) nutrients were positively correlated with the light attenuation coefficient and the Red/ Blue ratio, indicating that bad water quality could significantly reduce water clarity. Poor underwater light climate was the direct factor for degradation and loss of submerged macrophytes in eutrophic shallow lakes. The underwater light climate significantly affected species richness of submerged macrophytes in the study.

The study found that three or more species assemblages of submerged macrophytes could significantly improve the water clarity of the eutrophic lakes in the middle and lower reaches of the Yangtze River, but the water quality was not significantly improved. The basic species assemblage of *Myriophyllum spicatum* and *Vallisneria natans* could be more advantageous for the restoration of submerged macrophytes in eutrophic shallow Yangtze floodplain lakes.

Results imply that [species richness](#) and species assemblage are critical

for restoration of submerged macrophytes in eutrophic shallow lakes.

This study provides theoretical guidance for the stepwise restoration of submerged vegetation and the long-term maintenance of [clear-water](#) state in eutrophic lakes along the mid-lower reaches of the Yangtze River.

Relevant research results have been published in *Science of the Total Environment* titled "How many submerged macrophyte [species](#) are needed to improve water clarity and quality in Yangtze floodplain lakes?"

**More information:** Han Liu et al. How many submerged macrophyte species are needed to improve water clarity and quality in Yangtze floodplain lakes?, *Science of The Total Environment* (2020). [DOI: 10.1016/j.scitotenv.2020.138267](#)

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