



## Experimental comparisons of three submerged plants for reclaimed water purification through nutrient removal

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### ABSTRACT

Submerged aquatic plants have attracted increasing attention as an advanced component for wastewater treatment. This study performed a laboratory-scale investigation using three submerged plants, namely *Myriophyllum verticillatum*, *Potamogeton perfoliatus*, and *Najas minor* to determine the response of submerged plants to seasonal changes and intermittent reclaimed water amendment. The three plants were pre-selected from seven commonly used submerged plants. Reclaimed water from a wastewater reclamation plant was used as raw water. The total phosphorus (TP), total nitrogen (TN), ammonium, chemical oxygen demand, and dissolved oxygen were monitored during the experiments to investigate their resistance to changes in water conditions. With seasonal changes from April to June, the water temperature ranged between 19 and 23°C, and the TN and TP removal efficiencies were negatively affected. The highest TN and TP concentrations in the tanks with *M. verticillatum* and *P. perfoliatus* were reached on day 14. However, *N. minor* exhibited sustained growth, and the water quality remained in good condition. The TN and TP removal efficiencies were 81 and 62%, respectively. In addition, the intermittent reclaimed water amendment tests on the three plants yielded similar results. The TN and TP removal efficiencies of *N. minor* were 55 and 93%, respectively. *N. minor* proved to be a promising plant for water purification.

*Keywords:* Landscape ponds; Purification efficiency; Reclaimed water; Submerged plants

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