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Short communication

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**Wastewater treatment and membrane fouling with algal - activated sludge culture  
in a novel membrane bioreactor: Influence of inoculation ratios**

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**Abstract:**

A novel MBR system was developed combining an activated sludge MBR with algae in a single tank, which aimed to improve the wastewater treatment and membrane fouling with mild aeration. Meantime, the influences of different inoculation ratios of algae and activated sludge on the performances were explored. The appropriate algal proportion would improve MBR performance compared with conventional MBR. The highest COD, TN and phosphorus removal efficiencies were observed in R2 with inoculated ratio (algae/activated sludge) of 1:5. While, the highest  $\text{NH}_4^+$ -N removal efficiency was in R3 with the ratio of 1:1. Comparatively, the mechanisms associated with nutrient removal were varied with the different ratios. Moreover, compared with conventional MBR, the membrane fouling was mitigated in R2, while deteriorated in R3. Further mechanism investigation suggested that the different ratios have great effects on the variation of growth environment, flocs properties and EPSs contents, which might be closely associated with the performance.

**Keywords:** Algal-activated sludge - MBR system, Algae/activated sludge inoculum

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