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Short Communication

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Anqi Yang, Wei Zhao, Meng Peng, Guangming Zhang, Ran Zhi, Fan Meng

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A special light-aerobic condition for photosynthetic bacteria-membrane bioreactor technology

Anqi Yang ^a, Wei Zhao ^{b#}, Meng Peng ^a, Guangming Zhang ^{c, a*}, Ran Zhi ^a, Fan Meng ^a

^a School of Environment and Natural Resource, Renmin University of China, Beijing 100872, China

^b Heilongjiang Province Hydraulic Research Institute, Harbin 150080, China

^c State Key Laboratory of Urban Water Resource and Environment, Harbin Institute of Technology, Harbin 150090, China

[#] Co-first author

Abstract: The combined photosynthetic bacteria (PSB) and membrane bioreactor (MBR) technology has the great advantage of simultaneously realizing wastewater purification and bio-resource recovery and has attracted increasing attention in recent years. Light-oxygen conditions are the most vital factor in wastewater treatment. The special light-aerobic condition was first applied to PSB-MBR wastewater treatment, and it was compared with three typical light-oxygen conditions. The results showed that the highest chemical oxygen demand (COD) removal efficiency (96.28%) and the highest biomass production (1.12 g/L/d) were simultaneously obtained under light-aerobic condition. This phenomenon overcame the limitations whereby optimal pollutant removal and bio-resource recovery could not be achieved at the same time. An analysis of the microbial community showed that different light-oxygen conditions caused large variations in the microbial community composition of PSB-MBR. The microbial diversity was lower when light and oxygen co-existed.

Keywords: photosynthetic bacteria; wastewater treatment; light-aerobic condition; microbial community.

1. Introduction

* Corresponding author, email: zgm@ruc.edu.cn, tel: 86-10-82502680.

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