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研究论文

淡水鱼池土腥异味物质含量与浮游藻类和放线菌生物量的关系

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摘要 通过顶空固相微萃取-气质联用色谱测定北京市精养鱼池中两种主要土腥异味物质（土臭味素和二甲基异莰醇）含量，同时测定鱼池中浮游藻类和放线菌生物量，研究了土腥异味物质含量与浮游藻类和放线菌生物量之间的关系。结果表明，试验鱼池中土腥异味物质以土臭味素为主，土臭味素在精养鱼池中普遍存在，含量为1.22～35.58 ng•L^{-1}，二甲基异莰醇在部分鱼池中被检出，含量1.39～6.00 ng•L^{-1}。精养鱼池中共检出浮游藻类6门22属，生物量17.33～178.34 mg•L^{-1}，以硅藻和裸藻为主。放线菌共测到4个属，其中链霉菌*Streptomyces* sp.是主要种类，放线菌总生物量0～76×104ind.L^{-1}。鱼池中浮游藻类总生物量与土臭味素含量正相关。浮游藻类中的颗粒直链藻*Melosira granulata*和条纹小环藻 *Cyclotella striata* 可能是北京地区夏秋季节淡水精养鱼池中能够产生土臭味素的主要藻类，裸藻和其他鞭毛藻类对池中异味化合物的产生可能作用较小。

关键词 浮游藻类 放线菌 土腥异味 土臭味素 二甲基异莰醇 淡水精养鱼池

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The relationship between concentration of odorous compounds and biomass of phytoplankton and actinomycetes in freshwater fish ponds of Beijing

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Abstract The concentration of two odorous compounds (geosmin and 2-methylisoborneol MIB) in intensive cultivation freshwater fish ponds of Beijing were detected by coupling HSPME with GC-MS, and the biomass of the phytoplankton and actinomycetes in the ponds were investigated at the same time. The relationship between concentration of odorous compounds and biomass of phytoplankton and actinomycetes was researched. The results show that geosmin as the main composition of odorous compounds was found in all ponds with its concentration from 1.22 to 35.58 ng•L-1, MIB was found in some ponds with its concentration from 1.39 to 6.00 ng•L^{-1}.

Algae of 6 phylum and 22 genera was determined in the ponds with its biomass from 17.33 to 178.34 mg•L^{-1}, of which Bacillariophyta and Euglenophyta were dominant species. Four genera of actinomycetes with gross biomass from 0 to 76×104 ind•L^{-1} were found in the ponds, of which *Streptomyces* was dominant. Regression analysis between the concentration of geosmin and the total biomass of dominant algae was positive. *Melosira granulata* and *Cyclotella striata* probably were main microorganism causing off-flavour in Beijing's intensive cultivation freshwater fish ponds in summer and autumn; Euglenophyta and other algae probably played a little role in causing off-flavour.

Key words phytoplankton _ actinomycetes _ off-flavour _ geosmin _ MIB _ intensive cultivation freshwater fish ponds

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