嘉兴石臼漾湿地冬季浮游植物群落结构特征

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Phytoplankton community structure in Shijiuyang constructed wetland of Jiaxing, Zhejiang Province of East China in winter.

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摘要 2010年冬季对嘉兴石臼漾饮用水水源人工湿地水体的浮游植物群落结构进行了调查,以探索湿地净化措施对浮游植物群落结构的影响.结果表明：在石臼漾湿地共发现浮游植物77种,隶属7门39属,其中硅藻门最多,为14属33种;优势种有变异直链藻、梅尼小环藻、菱形藻、色球藻、针晶蓝纤维藻、四尾栅藻、小型黄丝藻等,梅尼小环藻优势度最大,为0.144.石臼漾湿地冬季浮游植物平均密度为1.28×10^6 cell·L^{-1};出水口密度最低,为6.80×10^5cell·L^{-1},并且出水口蓝藻细胞的密度仅为进水口的14.9%($P<0.05$).各采样点Shannon多样性指数为0.94～1.27.经聚类和多维尺度分析,石臼漾湿地冬季浮游植物群落可分为根孔沿岸带群落、根孔植物床流水型群落(2种)、深度净化湖区静水型群落和湿地源水群落五大类;各采样点生态环境及水体流速的不同是五类群落产生的主要影响因素.

关键词 水源湿地   石臼漾人工湿地   浮游植物群落   聚类分析   多维尺度分析

Abstract： Aimed to explore the purification effect of constructed wetland on phytoplankton community structure, an investigation was conducted on the species composition, biomass, and community diversity of phytoplankton in the water body of Shijiuyang constructed drinking water source wetland of Jiaxing, Zhejiang Province of East China in winter, 2010. A total of 77 phytoplankton species were identified, belonging to 39 genera of 7 phyla. The main phylum was Bacillariophyta, with 33 species of 14 genera. The dominant species were *Melosira varians*, *Cyclotella meneghiniana*, *Nitzschia* sp., *Chroococcus* sp., *Dactylococcopsis rhaphidioides*, *Scendesmus quadricauda*, and *Tribonema bombycium*, among which, *C. meneghiniana* had the highest dominance (0.144). The phytoplankton density in winter was averagely 1.28×10^6 cell·L^{-1}, with the minimum (6.80×10^5cell·L^{-1}) in the water outlet, and the density of *Cyanophyta* in the water outlet was significantly lower than that in the water inlet ($P<0.05$), only occupying 14.9% of the latter. The Shannon index of the phytoplankton community at the sampling sites ranged from 0.94 to 1.27. According to the cluster analysis and multidimensional scaling (MDS), the phytoplankton community was classified into five phytoplankton community groups, *i.e.*, root-channels littoral community, root-channels flow community (2 styles), highly purified area community, and headwater region community. Diverse ecological environment and water flow velocity at the sampling sites were found to be the main contributors to the formation of the five phytoplankton community groups.

Key words： water source wetland   constructed wetland of Shijiuyang   phytoplankton community   cluster analysis   multidimensional scaling analysis

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