

研究报告

选择性化学萃取对自然水体生物膜上微生物的影响

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摘要

用平板计数法、显微镜直接计数法及培养法分别研究了选择性萃取剂对自然水体生物膜上细菌、原生动物和藻类的影响.结果表明,随着选择性萃取剂萃取能力的增强,生物膜上存活下来的微生物数量呈减少趋势.经 $0.01 \text{ mol}\cdot\text{L}^{-1} \text{ NH}_2\text{OH}\cdot\text{HCl}+0.01 \text{ mol}\cdot\text{L}^{-1} \text{ HNO}_3$ 、 $0.4 \text{ mol}\cdot\text{L}^{-1} \text{ Na}_2\text{S}_2\text{O}_4$ (pH 6.0)和 $0.2 \text{ mol}\cdot\text{L}^{-1}$ 草酸氨(pH 4.0)萃取后存活的微生物总量分别下降到原膜的27.6%、14.1%和0.01%;经15% HNO_3 萃取后,膜上只有极少数的细菌存活;而经 $\text{H}_2\text{O}_2/\text{HNO}_3$ 萃取后则无细菌存活、原生动物和藻类存活,说明选择性化学萃取剂的使用影响生物膜的活性.比较萃取前后生物膜吸附痕量重金属的能力发现,随着生物膜上微生物数量的减少,生物膜吸附痕量重金属的能力逐渐降低.

关键词 [选择性萃取](#) [生物膜](#) [微生物](#) [重金属](#) [吸附](#)

分类号

Effects of selective extraction on microorganisms on biomembrane in natural water body

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Abstract

By the methods of direct viable count and plate count, this paper studied the effects of different selective extractants on the bacteria, algae and protozoan on the biomembrane in natural water body. The results indicated that the stronger the extraction ability of selective extractant, the fewer the living microorganisms on the biomembrane after extraction. Compared with the control, the percentages of living microorganisms on the biomembrane were 27.6, 14.1 and 0.01, respectively, after extracted by hydroxylamine hydrochloride ($0.01 \text{ mol}\cdot\text{L}^{-1} \text{ NH}_2\text{OH}\cdot\text{HCl}+0.01 \text{ mol}\cdot\text{L}^{-1} \text{ HNO}_3$), sodium dithionite ($0.4 \text{ mol}\cdot\text{L}^{-1} \text{ Na}_2\text{S}_2\text{O}_4$, pH 6.0), and acidified ammonium oxalate. Very few bacteria was left after extracted by nitric acid (15% HNO_3), and no microorganisms could be detected after extracted by $\text{H}_2\text{O}_2/\text{HNO}_3$, suggesting that the use of selective extractants affected the activity of biomembrane. With the decreasing amount of microorganisms on the biomembrane after treated with selective extractants, the adsorption of heavy metals by the biomembrane was gradually depressed.

Key words [Selective extraction](#) [Biomembrane](#) [Microorganism](#) [Heavy metal Adsorption](#)

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