

研究报告

背角无齿蚌对浮游藻类的滤食选择性与滤水率研究

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摘要

以滇池及其附近水体中分布的背角无齿蚌为研究对象, 分析其滤水速率及相关的影响因素, 研究其食物组成和滤食浮游藻类的选择性, 并初步估算其自然种群的滤水能力和控制浮游藻类的潜力. 结果表明, 背角无齿蚌的滤水率有一定的日变化, 傍晚时较高; 滤水率与水体中的悬浮物质含量密切相关, 随着悬浮物质浓度增加而减少; 滤水率与蚌的个体大小有关, 体重增加, 滤水率下降. 对比水体中与蚌消化道内浮游藻类所占的百分比, 发现其对浮游藻类的滤食没有显著的选择性. 自然水体中背角无齿蚌的滤水能力很低.

关键词 [背角无齿蚌](#); [滤水率](#); [滤食选择性](#); [浮游藻类](#)

分类号

Filtering capacity of *Anodonta woodiana* and its feeding selectivity on phytoplankton

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Abstract

Lake eutrophication associated with algal bloom has become a major environmental challenge in China. Filter feeding organisms, e.g., silver carp, bighead carp, and zebra mussel, have been widely used to manipulate water environment through their top-down effects. The bivalve *Anodonta woodiana* is widely distributed across China, and has been used for bio-manipulation of some water bodies. *In situ* experiments were performed in a bay of Lake Dianchi and its surrounding ponds to study the filtering capacity and the filter feeding rate of *Anodonta woodiana* in these aquatic habitats, and to determine the controlling factors. The results showed that there was a relationship between filtration rate and total suspended substances measured in laboratory during August and September 2001 when the water temperature was 20 ± 2 °C, which was expressed as $y = 4380.41 e^{-0.0184x}$ ($R^2 = 0.621, P < 0.05$) based on at least squares analyses. The filtration rate was strongly related to the body weight by measuring in laboratory over 24 hours during August 2001 when the water temperature was 20 ± 2 °C. At least squares analyses gave the equation $y = 2904.16 + 12076.24e^{-0.0034x}$

($R^2 = 0.9825, P < 0.05$). A slight variation of filtration rate was found over 24 hours, which could be explained by the bivalves' adaptation to the experimental circumstances rather than the daily change of its filtration feeding. In general, the filtration capacity of natural *Anodonta woodiana* population in the water bodies was very limited, as a result of its small population size. No significant selective feeding on algae was found by contrasting the relative abundance of algae in the habitats and the guts of *Anodonta woodiana*. The feeding selectivity on algae was

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neither correlated with the size of algae,nor with the initial abundance of algae in water column.

Key words [Anodonta woodiana](#) [Filtering capacity](#) [Feeding selectivity](#)
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