

三门湾大型底栖动物时空分布及其与环境因子的关系

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Spatiotemporal distribution of macrobenthic communities and its relationships with environmental factors in Sanmen Bay.

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摘要 2006年11月、2007年1月、4月和8月在三门湾18个采样点对大型底栖动物进行调查, 分析了其时空分布及其与环境因子的关系. 结果表明: 调查共采集到大型底栖动物124种, 其中多毛类44种、软体动物34种、甲壳动物22种、棘皮动物11种、其他类动物13种; 多毛类和软体动物物种数占总种数的62.9%, 二者构成了三门湾大型底栖动物的主要类群. 双鳃内卷齿蚕、小头虫和不倒翁虫是春季三门湾大型底栖动物的优势种; 不倒翁虫、双鳃内卷齿蚕和海稚虫为夏季的优势种; 不倒翁虫、小头虫、双鳃内卷齿蚕和白沙簪为秋季的优势种; 双鳃内卷齿蚕、不倒翁虫、小头虫和海稚虫为冬季的优势种. 三门湾大型底栖动物年均生物量为 $17.36 \text{ g} \cdot \text{m}^{-2}$, 年均栖息密度为 $72 \text{ ind} \cdot \text{m}^{-2}$. 不同季节大型底栖动物的平均生物量和平均栖息密度存在显著性差异. 大型底栖动物群落平均Shannon多样性指数在1.53~1.89, 平均Margalef物种丰富度指数在2.25~2.96, 平均均匀度指数在0.83~0.94, 3个指数在不同季节间均存在显著性差异. 经典对应分析, 影响三门湾大型底栖动物群落的主要环境因子包括海水的温度、盐度、溶解性无机氮以及表层沉积物中的有机质、总氮和总磷等, 环境变量可以较好地解释主要类群的变化.

关键词: 大型底栖动物 物种多样性 群落 环境因子 典范对应分析 三门湾

Abstract: In November 2006 and in January, April, and August 2007, an investigation on the macrobenthic communities was conducted at 18 stations in Sanmen Bay to study the relationships between the macrobenthic communities and environmental factors. A total of 124 taxa were collected, including 44 species of Polychaeta, 34 species of Crustacea, 22 species of Mollusca, 11 species of Echinodermata, and 13 species of others. The species of Polychaeta and Mollusca accounted for 62.9% of the total, which constituted the main population of the communities. *Aglaophamus dibranchis*, *Capitella capitata*, and *Sternaspis scutata* were the dominant species in spring, *Sternaspis scutata*, *Aglaophamus dibranchis*, and *Spionidae* spp. were the dominant species in summer, *S. scutata*, *C. capitata*, *A. dibranchis* and *Virgularia gustaviana* were the dominant species in autumn, and *A. dibranchis*, *S. scutata*, *C. capitata*, and *Spionidae* spp. were the dominant species in winter. There was a significant difference in the average biomass and average density of the macrobenthic communities between different seasons. The annual average biomass was $17.36 \text{ g} \cdot \text{m}^{-2}$, and the annual average density was $72 \text{ ind} \cdot \text{m}^{-2}$. The diversity indices of the macrobenthic communities also differed significantly between different seasons. The seasonal average Shannon diversity index was from 1.53 to 1.89, seasonal average Margalef species richness index was from 2.25 to 2.96, and seasonal average Pielou evenness index was from 0.83 to 0.94. Canonical correspondence analysis showed that the sea water temperature, salinity, and dissolved inorganic nitrogen, and the organic matter, total nitrogen, and total phosphorus in surface sediment were the main environmental factors affecting the macrobenthic communities. Environmental variables could better explain the changes of main macrobenthic species.

Key words: macrobenthos species diversity community environmental factor canonical correspondence analysis Sanmen Bay

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