

研究简报

典型河床底质组成中底栖动物群落及多样性

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摘要 底栖动物是河流生态系统中食物链的重要环节。通过对长江、黄河、东江和拒马河等河流野外调查和采样分析研究了河床底质组成对底栖动物群落结构的影响规律。研究发现, 不同河床底质组成中的底栖动物结构差别很大, 不同地理位置而相同底质条件和水力条件的河流底栖动物群落组成相似, 说明河床底质是影响河流底栖动物群落结构的关键因素, 受地理位置和大气气候的影响不大; 利用多项生物指标分析了不同河床底质组成中底栖动物群落的多样性, 卵石河床且有水生植物生长的河流底栖动物物种组成最丰富, 大河中沙质河床不稳定, 未采集到底栖动物; 不同底质类型河床中的优势种群亦不同。并分析了采样所得底栖动物物种数与采样面积之间的关系, 符合前者随后者呈幂指数增加的规律, 当实测采样面积为1~2m²时物种数变化不大, 建议一般情况下最小采样面积应为1m²。

关键词 [大型底栖动物](#); [河床底质](#); [栖息地](#); [群落结构](#); [生物多样性指数](#)

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Benthic macroinvertebrates communities and biodiversity in various stream substrata

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Abstract Benthic macroinvertebrates are vital in the food chain of aquatic bio-communities. Substrata play an important role in the benthic invertebrate communities, and the characteristics of stream substrata, such as bed material size, heterogeneity and stability, can obviously affect the benthic bio-community. Field investigations were done to study the biodiversity of macroinvertebrates in various stream substrata. Sampling sites differing in bed composition, latitude and climate were selected along the Yangtze River, the Yellow River, the East River, and the Juma River in China. The results show that the benthic community structures found in different substrata clearly differ, while those found in substrata of similar composition and flow conditions but in different macroclimates are quite similar. The study thus demonstrates that the benthic macroinvertebrate community is mainly affected by substrate composition and flow condition, but is generally unaffected by latitudinal position and macroclimate. Biodiversity in different substrata is assessed via several biodiversity indices. Taxa richness of the macroinvertebrate community was found to be highest in hydropyhte-covered cobbles, high in moss-covered bedrock, and relatively low in clay and cobble substrata devoid of plant biomass. Sand substrate is compact and unstable, and no benthic macroinvertebrates were found colonizing this substrate. Aquatic insects account for most of the macroinvertebrates found in these rivers. Different insect representatives dominate in different substrata types: mainly Ephemeroptera larvae were found in cobble and moss-covered bedrock substrata while Chironomidae larvae were found in clay beds. The relation between the number of species in the samples and the sampling area is also analyzed. The results support the species-area power rule. Since the experimental results differed little between surveys using 1m² and 2m² sampling areas, 1m² is suggested as a sufficient minimum sampling area.

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Key words [macroinvertebrates](#) _ [substrate](#) _ [habitat](#) _ [community](#) [structure](#) _ [biodiversity](#) [index](#)

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