HOW SEASONAL VARIATION OF STREAMFLOW AFFECTS AQUATIC MACROINVERTEBRATE COMMUNITIES

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**Abstract:** In the monsoon climate of East Asia, streamflow is marked by three distinctive periods: high flow period, normal flow period, and low flow period. Discharge, water level, and sediment concentration in streams vary greatly throughout the three periods. The seasonal variation of streamflow has a significant effect on the aquatic macroinvertebrate communities. This was investigated by a field survey throughout all three periods in the Zhuanchang River, a river in China’s Yunnan Province that boasts high aquatic biodiversity. Ecological traits including biodiversity, dominant taxa, and dominance of each taxon were measured. The biodiversity was highest during the high flow period which has the widest environmental range and is subject to the most disturbances (The richness was 14 ± 10 during the high flow period, 8 ± 6 during the normal flow period, and 12 ± 5 during the low flow period). The community structure also changed with the streamflow. The dominant taxa were Baetis, Hydropsyche, and Polypedilum during the high flow period; Baetis, Limnodrilus, and Branchiura during the normal flow period; and Simulium, Potthastia, and Polypedilum during the low flow period. The dominances of some taxa varied among different periods, while the dominances of other taxa kept almost constant through different periods. The dominance of Baetis was 0.124, 0.053, and 0.030 during the high flow period, normal flow period, and low flow period, respectively, which decreased with the streamflow. However, the dominance of Natarsia was 0.024, 0.020, and 0.037 during the high flow period, normal flow period, and low flow period, respectively, which kept almost constant. The macroinvertebrate community structures during the high flow and low flow periods differed remarkably, and the community structure during the normal flow period lay in between.

**Keywords:** streamflow, seasonal variation, macroinvertebrates, biodiversity, community structure