Seasonal Variation of Diversity and Habitat Preferences of Aquatic Insects along the Longitudinal Gradient of the Gadana River Basin, South-West Ghats (India)

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Abstract: Diversity and habitat preference of aquatic insects were studied in the Gadana River basin, South-West Ghats, South India, along its longitudinal gradient. We selected stream reaches corresponding to the 1st, 2nd, 3rd, 4th and 5th orders. Samples were collected in triplicate from different substrates (sand, litter deposited in pool areas, litter held in riffle areas, and stones) during the three different sampling periods and are designated on the basis of the rain regime; July (south-west monsoon), October (north-east monsoon) and March (dry season). We identified 5,065 specimens corresponding to 50 taxa. The analysis of diversity numbers (genus level) indicated that all insect taxonomic orders had higher numbers on the 4th order stream reach. The highest richness and abundance were observed during the south-east monsoon (July). Considering habitat preference, litter in riffle areas had the highest faunal richness.

Key words: Diversity, longitudinal gradient, aquatic insects, tropical river.

Introduction

A great deal of research has been made on the use of aquatic macroinvertebrates in water quality biomonitoring programs and in assessing environmental impacts in the USA as well as in many European countries (Metcalf 1989, Rosenberg, Resh 1993). Several cost-effective methods for water quality assessment have been developed, like the Rapid Assessment Protocols - RAP (Resh, Jackson 1993). The adequate application of such methodologies requires, for each situation, previous knowledge about many aspects of lotic macroinvertebrates, which are still lacking in India. Thus, it is important to understand the temporal and spatial patterns of macroinvertebrates along the longitudinal gradients of Indian rivers, as well as their distribution and abundance among different habitat types. This kind of information allows the determination of the most representative habitats in each situation, the degree of taxonomic resolution to be employed, and the number of samples to be taken (Plafkin et al. 1989).

Rivers can be studied on a variety of spatial scales (Frisseell et al. 1986). When the focus is on the distribution among different habitats, a comparison can be made between eroding and depositing habitats, like riffles and pools areas. On a broader

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