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Microhabitat preference of caddisfly (Trichoptera) communities in a medium-sized lowland stream in Latvia

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Abstract

The microhabitat preference of caddisfly (Trichoptera) communities was studied in 8 types of microhabitats in a fast-flowing, medium-sized, lowland stream in Latvia. A total 36 caddisfly taxa belonging to 14 families were recorded in microhabitat samples. A PCA biplot of caddisfly taxa abundance in microhabitats showed 3 distinct caddisfly taxa groups: depositional [Limnephilidae Gen. sp., *Anabolia laevis* (Zetterstedt) and *Lasiocephala* basalis (Kolenati)], lithal [*Agapetus ochripes* Curtis and *Psychomyia pusilla* (Fabricius)], and submerged macrophyte and water moss caddisfly microhabitat communities (*Ithytrichia lamellaris* Eaton, *Hydropsyche siltalai* Döhler and *Hydropsyche* spp. juv.). The habitats of these groups differed in current velocity and the amount of plant detritus. All size lithal microhabitat samples were characterized by grazer and scraper dominance and a similar proportion of gatherers/collectors. Macrolithal microhabitat with *Fontinalis* sp. and submerged macrophyte microhabitats were rich with passive filter feeders. Functional feeding type ratios were equal, with dominance of shredders, in FPOM, CPOM in akal microhabitats. Submerged macrophyte and *Fontinalis* sp. provided suitable niches for higher species numbers than the other microhabitat types, whereas abundance was the highest in the lithal microhabitats with the largest particle size.

Key words: Tumsupe stream, PCA, functional feeding groups

Introduction

Caddisfly microhabitat preference have been widely studied since the middle of the 20th century (e.g., Allan 1995, Ward 1992), however, such investigations have been conducted relatively rarely in Latvia (Kachalova 1972) and in the Baltic Ecoregion. In Latvia, a very low level of fertilizers is typical in comparison with that in other European countries (Springe *et al.* 2006).

Medium-sized streams are hierarchically structured and heterogeneous ecosystems. The local community composition results from an interplay of local and regional factors, both abiotic and biotic (Poff 1997). However, numerous studies have demonstrated that the local scale environmental variables explained most of the variance of macroinvertebrate community data (e.g., Galbraith *et al.* 2008, Sandin & Johnson 2004, Costa & Melo 2008).

Ward (1992) stated that streambed substratum type is the major factor affecting the distribution and abundance of lotic invertebrates, which provides habitat space, food, and protection. Also, Beisel *et al.* (1998) found that the co-structure between community organization and environmental variables indicated that substrate may be a primary determinant of community structure, but current velocity and water depth emerged as secondary factors. Stream substrate usually is highly variable

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