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Notes on the larval habitat preference and microdistribution of *Potamophylax rotundipennis* (Insecta: Trichoptera) in a stream reach of the Börzsöny Mountains (Northern Hungary)

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ABSTRACT: Larval habitat preference of *Potamophylax rotundipennis* (Insecta: Trichoptera) was examined under natural conditions. The result of this study indicated a high preference for stone to sand and detritus, and preference for the low depth of water. This preference resulted that *P. rotundipennis* larvae showed a homogenous distribution along the stream-reach, but not across it.

Introduction

Potamophylax rotundipennis (BRAUER 1857) is a common caddisfly (Insecta: Trichoptera) species in the Northern Mountains, Hungary (UHERKOVICH & NÓGRÁDI 1994, KISS et al. 1995, 1999; ANDRIKOVICS et al. 1995). In spite of its commonness, there are only a few literature data on the biology of the species. KRISKA (2001) states that the characteristic substratum of the habitat determines the case building material of the larvae. Hence, the case could be build from plant or mineral materials depending upon the substratum being present on the bottom. However, under labour conditions, *P. rotundipennis* shows preference for pebbles and gravel to sand (HIGLER 1975), and a substratum change could be indicated at different larval stages (OLÁH 1972). Under natural conditions, this preference has not been confirmed yet. In this study, I aimed to support or not, whether *P. rotundipennis* larvae show preference for gravel under natural conditions. If *P. rotundipennis* larvae can be found mostly on gravel in field, then substrate preference can be regarded as the most important factor effecting the microdistribution of *P. rotundipennis*. If the preference experiment in labour (HIGLER 1975) receive rejection, then other factors influence the microdistribution of *P. rotundipennis* larvae.

Material and methods

Börzsöny Mountains (Northern Hungary) are a series of separate mountain peaks, which has been created by volcanic activity in the Tertiary. The study area at Bernecebaráti (N48°01' E18°55'), 200 m above see level, lies in the northern part of the Börzsöny Mountains, consisting of *andesite* and *andesite*-tuff. Here runs the Bernecei stream. The depth of the water varies from 5 to 32 cm. As a result of a former study (SCHMERA 1999) a sampling site and time was fixed at a natural, undisturbed stream reach. Caddisfly larvae were collected from the area of 240 × 150 cm divided into 160 elemental cells (the size of every elemental cell was 15 × 15 cm). In other words, a grid was fitted on the stream reach in order to get statistically acceptable information about the position of every caddisfly individual collected under the grid. The longer brink of the grid (horizontal direction) was positioned across the axis of the

stream, the shorter brink of the grid was positioned parallel with the stream (vertical direction). Caddisflies were collected individually on 24. 04. 1998., 23. 05. 1998. and on 07. 06. 1998. The substrate type, from which each individual was collected, the position of the elemental cell and the depth of the water were recorded. The following substrate types were regarded: sand, stone and detritus. The identification based on the work of WARINGER & GRAF (1997). The identification of the larvae was supported by light trap catches (KISS & SCHMERA 1999).

The normal distribution of the data set was tested by Kolmogorov-Smirnov test by the help of STATISTICA program (STATSOFT, 2000). The homogeneity of the variables (both in vertical and in horizontal direction) was calculated by Kruskal-Wallis test.

Results and Discussion

Four *Potamophylax rotundipennis* individuals were collected on 24 March, 94 individuals on 23 May and 2 individuals on 27 June. The preference for substrate type shows the following picture: 62.8% of the collected individuals was on stones, 25.5% on sand and 11.7% on detritus. Fig. 1 shows the preference of *P. rotundipennis* for the depth of the water in the studied stream reach. Most of the individuals prefer two, three or five centimetre depth water. The highest number of individuals was collected in May; thus, this data set was only used to indicate the spatial dependence of the caddisfly species. The normal distribution should be rejected based on Kolmogorov-Smirnov test (d=0.4328, p<0.01), so non-parametric statistics was used to indicate the homogeneity of the variables. The vertical direction of the grid should be accepted as homogenous (Kruskal-Vallis test: H=7.288, df=9, p=0,6072). It means that the spatial pattern of *P. rotundipennis* is homogeneous along the stream in the studied stream reach. On the other hand, the homogeneity of the horizontal direction of the grid should be rejected (Kruskal-Vallis test: H=33.25, df=9, p=0.0001). As a result of this study the spatial pattern of *P. rotundipennis* is not at all homogenous across the steam in the studied stream reach.

A lot of information is available about the ecological preference of different caddisfly species to their habitats. BEISEL et al. (1998) found that the substrate might have the major effect on the macroinvertebrate assemblages in a stream and current velocity and water depth emerged as secondly factors. This study confirmed the known substrate preference of *Potamophylax rotundipennis* larvae under natural conditions and contributed to the interpretation of spatial distribution of *P. rotundipennis* in streams.

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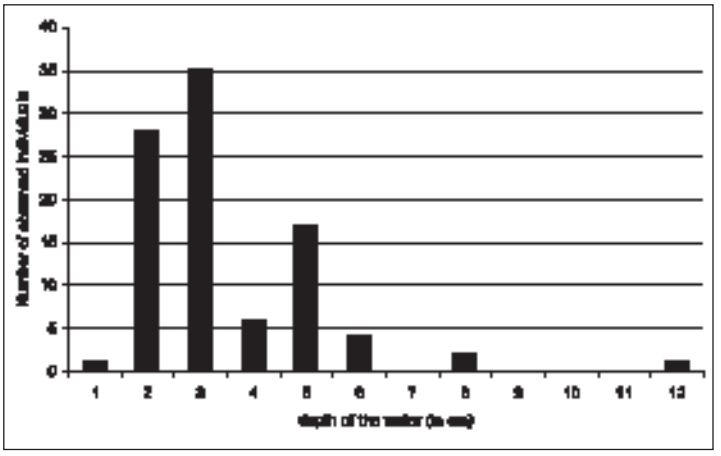

Fig. 1. Frequency distribution of *Potamophylax rotundipennis* for the depth of the water in centimetre.

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