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Caddisflies (Trichoptera) of artifical water courses in the Bakony Mountains, Central Hungary

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Abstract. Three artificial water courses were formed in the area as a result of long-term karst water pumping over about 30 years. Rich caddisfly communities developed in them: altogether more than 95.000 specimens of 72 species were collected in light traps along the three water courses. Pumping was discontinued in the middle 1990s so that the water courses returned to their original state.

The Bakony Mountains lying in Central Hungary, North of Lake Balaton, are karst mountains. A rich stream network and many springs occurred there, as shown in old maps. About thirty to forty years ago bauxite mining was expanded considerably. As the level of mining went deeper and deeper, karst water became more and more a problem in the exploiting of ore. To avoid the accidental break-in of karst water and to secure the safety of mining, permanent pumping took place around Nyirád, in the Western part of the mountains. The quantity of pumped water reached 80 m³ per minute and it was released into three water courses. The pumpings lasted for about thirty years.

Two of these water courses belonged to the water system of the River Marcal running to the north, while the third ran to the south into Lake Balaton. One of these courses was especially big as in the stream "Meleg-víz" ('Warm Water') which carried the majority of karst water, and its temperature was almost constant through the year. Its temperature in January did not fall below 17°C about 15 km away from the pumping stations. The gradient of the stream was about 75 m along the 25,5 km length, therefore its flow was rather fast. The bed was formed by limestone (the original rock of the region), and calcareous tufa formed during the long term pumping. There were some bed sections which were covered by pebble and silt. The aquatic and riparian vegetation remained green all the year round.

Another water course – "Kígyós-patak" – running nearby and parallel with "Meleg-víz" carried cooler water, also into the River Marcal. These two rivers maintained the water output of the River Marcal.

The third artificial water course, "Kétöles-patak" ('Four-meter-wide-stream') also had cool water and it ran into Lake Balaton.

The pumping of karst water was discontinued after about thirty years, in the middle of the 1990's. Following this change the beds of these streams became almost dry and they reverted to their former state.

During the 1980s we studied the caddisflies of these waters. Some preliminary results have been published (UHERKOVICH & NÓGRÁDI 1988). Two light traps were also set beside these stream, and their very large catches were finally dealt with in the winter of 1998/99.

Along "Meleg-víz", close to the stream, a light trap was operated for seven months from the end of May until the end of December 1987. It captured 90,506 adults of 61 caddisfly species; 81.77 % of them were hydroptilids (predominantly three species: *Hydroptila angustata, Oxyethira falcata* and *Orthotrichia angustella*). The species and their dominance relations are listed in Table 1.

At "Kígyós-patak" another light trap was set up for only a few months in 1987. Although it was farther away from the water, it captured 3,282 adults of 35 species. A few personal collections are also included in the quantitative data of Table 1. Along "Kétöles-patak" we collected only a few times, and no light traps were set up. These results are also given in Table 1.

Along the upper reaches of "Meleg-víz" *Silo nigricornis* was collected. The first authentic specimens of *Hydroptila simulans* were captured along "Kígyós-patak". This species was earlier published but not always correctly identified; a later revision clarified these mistakes (NÓGRÁDI 1994). The species *Orthotrichia angustella* is a rarity in Hungary, only a few specimens were collected in the SW part of the country. Along the stream "Meleg-víz" it was the subdominant species. The dominant species, *Oxyethira falcata* is also usually uncommon. *Hydroptila angustata* occurs at many sites (NÓGRÁDI & UHERKOVICH 1994), but it rarely reaches high dominance.

The rather fast-running water with maximum oxygen content provided very favourable conditions for caddis larvae. The development of a few species, mostly hydroptilids and *Psychomyia pusilla,* seemed to be permanent. Due to the large mass of warm water, a moderate microclimate formed, and it was also favourable for the activity of adults. During the winter, when normally no caddisflies are on the wing in Hungary, adults of some species could be collected. It was also observed that the relatively rare dragonfly, *Sympetrum pedemontanum* was also on the wing very late in the season, along a narrow zone of the stream (TÓTH 1990). In "Meleg-víz" some tropical plants and snail species were introduced by aquarists, who bred their plants for aquaria in artifical inlets of the water courses.

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