

Biodiversity and structure of temporary pool communities in Hungary

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Temporary pools and their communities

Temporary pools (Fig. 1) often house rare and endemic plant and animal species and therefore make an important contribution to regional (γ) diversity. Temporary pool inhabitants include large branchiopods (Anostraca, Notostraca, Conchostraca), the **flagship species** (Fig. 2) for these habitats, smaller branchiopods (Cladocera), ostracods, copepods, rotifers, larval and adult insects, mites, turbellarians and amphibian larvae.



Fig. 2: The notostracan *Lepidurus apus* (left), anostracans and cladocerans (right).



Fig. 1: Temporary pool in the Kiskunsagi National Park (Hungary) on March 27th (left) and May 21st (right) of 2005.

Flagship species are peculiar species which are used to draw the attention of the public to the importance of a certain habitat and the necessity of its conservation.

Methods

In the spring of 2005, 36 temporary pools in and around the Kiskunsagi Nemzeti Park (Hungary) were selected. Each habitat was sampled twice a month, from the start of the aquatic phase (March) until the pools were dry (Fig. 4).



Fig. 4: Drying process of a temporary pool in the Kiskunsagi National Park (from left to right: March 24th, May 4th, May 21st of 2005).

The **survey** included the monitoring of the most important habitat characteristics (depth, surface, turbidity, vegetation, chlorophyll *a*, temperature, conductivity, oxygen...) and the sampling of the macrozooplankton (Fig. 5), large branchiopod and macroinvertebrate community. Amphibian larvae were also counted. Resting egg banks were sampled at the end of the aquatic phase of each habitat.



Fig. 5: Sampling of the zooplankton.

In the future, **field enclosure experiments** are planned to assess the relative importance of abiotic conditions and competition and predation between selected taxa (Anostraca, Cladocera and Odonata). Early **life history characteristics** and the **vulnerability to predation** (by Odonata) of populations of selected species (Anostraca, Cladocera) will be studied in the laboratory.

Aim of the study

With our study, we want to reveal the temporal dynamics and relative importance of local abiotic conditions and biotic interactions between **keystone species** of temporary pools (large branchiopods, cladocerans, odonate larvae) in explaining the observed patterns of **community structure** in hydrologically different habitats (Fig. 3).

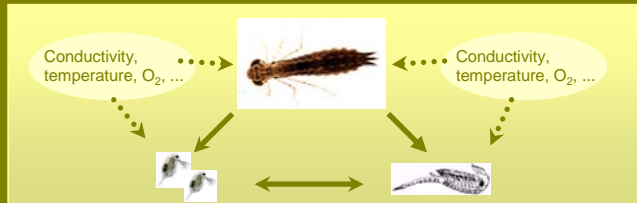


Fig. 3: Simplified scheme of potential abiotic and biotic interactions between keystone species and the environment in temporary pools.

Threats to temporary ecosystems

The recent joining of Hungary to the EU will probably result in the intensification and modernization of **agricultural activities** and an **increasing pressure** on the integrity of temporary habitats. Because temporary pools and their inhabitants are influenced directly by temperature and precipitation patterns, they could also be greatly affected by **climate changes**.

A better knowledge of the structure and functioning of communities in temporary aquatic systems is necessary in order to design optimal management regulations for the conservation of this type of biotope.



Fig. 6: Grazing and agriculture in and around the Kiskunsagi National Park.