

## Limiting similarity and environmental filtering under drought stress in streams, a case study on diatoms

Várbíró, Gábor<sup>1,2</sup>; Bouchez, Agnès<sup>3</sup>; Rimet, Fredric<sup>3</sup>; Tapolczai, Kálmán<sup>3</sup>; Novais, Maria Helena<sup>4</sup>; Morais, Maria Manuela<sup>4</sup>; Usseglio-Polatera, Philippe<sup>5</sup>; Bácsi, István & B-Béres, Viktoria<sup>2,7\*</sup>

<sup>1</sup>MTA Centre for Ecological Research, Danube Research Institute, Department of Tisza Research, Debrecen, Hungary, <sup>2</sup>MTA Centre for Ecological Research, GINOP Sustainable Ecosystems Group, Tihany, Hungary, <sup>3</sup>INRA, UMR CARRETEL, Thonon, France, <sup>4</sup>Laboratório da Água, Instituto de Ciências da Terra, Universidade de Évora, Évora, Portugal, <sup>5</sup>University of Lorraine, CNRS, LIEC, Metz, France, <sup>6</sup>University of Debrecen, Department of Hydrobiology, Debrecen, Hungary, <sup>7</sup>MTA-DE Lendület Functional and Restoration Ecology Research Group, Debrecen, Hungary, \*e-mail: beres.viktoria@gmail.com

Environmental filters are operating on the traits of species rather than on species themselves, which is why trait composition could more efficiently explain ecosystem functioning than species richness. Based on diatom trait composition, the applicability of the concept of “limiting similarity and environmental filtering” was studied in ephemeral streams. We examined whether the divergence or convergence of traits can influence the functioning of this type of streams. The main question was: Which mechanism has the strongest influence on the diatom community structure under drought stress? We studied the “effect size”, which is the value of the distance of the trait composition, of observed samples when compared to the null distribution. This effect size value can be used to compare “drought-affected” to “perennial” streams. Diatom samples were collected from small- and medium-sized lowland streams in the Hungarian Lowland Region between 2007 and 2015 from the beginning of April to the end of October (i.e. the vegetation period). Summers and autumns were extremely dry during the 2011-2014 periods. Many rivers and streams dried out during the fall sampling period. These watercourses were considered as “drought-affected” streams. Diatom data collected from these streams in 2010, which was an extremely wet year in Hungary, were used as data representative of “perennial” watercourses as well as data from streams that were not dried over the course of the 2007 - 2015 period. We found that the divergence and convergence of traits in diatom assemblages is different in “drought-affected” and “perennial” streams.