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## **Summary**

### ***Taxonomical diversity of diatom assemblages inhabiting selected tree species in areas with varying degrees of urbanization***

The aim of the work was to investigate diatoms and determine the structure and dynamics of diatom assemblages developing on the trunks of selected species of deciduous trees. An attempt was also made to determine what factors may affect the species composition of the analyzed diatom communities. Moreover, due to the fact that there are not many studies on diatoms in terrestrial environments, it was assumed that the studied habitats will be the place of occurrence of rare species and not yet recorded in commonly studied aquatic environments.

The research was carried out in 2017–2018 period in eight research seasons, at eight sites located in two provinces of Małopolska (Poręba Wielka in the buffer zone of the Gorce National Park) and Podkarpacie (Krempna in the buffer zone of the Magura National Park and two cities - Stalowa Wola and Rzeszów). At each of the sampling sites, materials were collected from three different genera of trees: sycamore maple (*Acer pseudoplatanus*), linden (*Tilia* sp.) and poplar (*Populus* sp.). Each time, samples were taken from all microhabitats available within the trunk (“bare” bark, bark covered with green algae and covered with bryophytes and lichens), at a height of 20 and 150 cm above the ground level.

The collected bark pieces were used to prepare the filtrates, where chemical parameters were measured. These parameters indicated a high concentration of nutrients in the analyzed habitats and a slightly acidic to neutral reaction. The obtained results did not show any significant differences between the tree species from which the collected materials were taken. There was also no relationship between the concentration of the measured ions and the presence of diatoms.

The studied microhabitats were characterized by high diatom diversity, a total of 160 taxa were identified. For 28 of all observed taxa, it was the first report from the Poland, moreover, for 14 of them it was the first record after its *locus typicus*. Among all recorded species 13 are listed on the Red List of Polish Algae. In total, 13 species were defined as dominants (>10% share in the assemblages), among which two (*Luticola acidoclinata* and *Orthoseira dendroteres*) occur in almost monocultural assemblage. The vast majority of the identified diatoms were considered typical for terrestrial environments, but their exact preferences in terms of environmental parameters are still not well-known due to their rare

occurrence in aquatic environments, and the fact, that they have been described as new to science in last few years.

Statistical analysis distinguished four groups of diatom assemblages based on the dominant species, whose occurrence was decisively influenced by the tree species, from which the samples were taken. On the other hand, both the position on which the tree grew and the microhabitat within the trunk had no effect on the separation of groups in the performed analyzes.

The conducted research is one of the only few in the world, that focuses on diatoms inhabiting tree trunks. The obtained results concerning species richness and the identification of rare, poorly known species constitute the starting point for further research on diatoms in terrestrial habitats and their ecological preferences.