

## Summary of doctoral dissertation

### **„Soil nematodes as biological indicators of changes in soil from the breeding colonies of wetland birds”**

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The purpose of the dissertation was to analyse, whether breeding colonies of wetland birds, black cormorant and gray heron significantly affect soil nematode communities. Moreover, the bioindication features of soil nematodes, were used to assess the direction of changes occurring in soil in the area under pressure of wetland birds. Research sites – bird breeding colonies and control areas were located in the "Stawy Raszyńskie" nature reserve in Falenty. To assess the number and taxonomic composition of nematodes, soil samples with an surface area of 2 cm<sup>2</sup> to a depth of 20 cm were taken. Samples were collected three times during each of the two seasons. Five trophic groups of soil nematodes were indicated: bacterivorous, fungivorous, herbivorous, omnivorous and predators.

To describe the changes in soil nematode communities, some ecological parameters and indicators were used, such as: density, share of trophic groups, number of genera, Shannon diversity index, Sørensen similarity index, dominance index. Furthermore, indicators devised exclusively for nematodes were used, such as: Maturity Index – MI, Enrichment Index – EI; Channel Index – CI; Structure Index – SI.

It was found that the increased amount of nutrients contained in bird droppings, causes changes in the composition and structure of nematode communities. The density of soil nematodes in the breeding colonies area was significantly higher compared to the control area. Bacterivorous nematodes were the dominant group, which evince the intensification of organic matter decomposition process and high activity of soil microorganisms. In soil from the breeding colonies, the Shannon biodiversity index and the total number of nematodes genera were clearly decreased compared to control area. The structure of dominance was also simplified, only a few common genera of bacterivorous nematodes dominated.

The changes found in soil nematode communities were successfully corresponded with changes in some physicochemical and microbiological parameters of the soil. Therefore, it confirmed the bioindicative value of soil nematodes in the assessment of changes occurring in the soil from the breeding colonies of wetland birds.