

Structure of plant parasitic and soil free-living nematode communities in natural habitats affected by *Heracleum sosnowskyi* invasion in Poland

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The current rate of non-native plant species invasions in new geographic localities is the highest in history. Invasive plants frequently change the composition and structure of vegetation communities, disturbance regimes, and nutrient cycling. Such changes can alter the quantity and quality of habitat for animal species at multiple trophic levels, including soil nematodes. *Heracleum sosnowskyi* is the second most important invasive *Heracleum* species in Europe. In Poland, until the middle of the 20th century, only one species of the genus, non-invasive *H. sphondylium*, grew in the wild as a native plant. In the second half of the century new species such as *H. sosnowskyi* (Sosnowski's hogweed) and *H. mantegazzianum* (giant hogweed) were introduced from the Caucasus to Europe for decorative purposes or as a fodder plants. Both species are now widespread, not only in Poland, and are now considered as the most problematic and dangerous invasive plant. In present study, we analysed the effect of *H. sosnowskyi*, on soil nematode communities and diversity, and plant species composition by comparing invaded and non-invaded (control) areas in natural conditions. Invasion of *H. sosnowskyi* caused significant shifts in plant species composition, which subsequently modified nematode assemblages. Stress sensitive omnivores, fungivores and root-biomass-depending obligate plant parasites best reflected changes in soil nematode communities under the influence of *H. sosnowskyi* invasion. Negative effect of *H. sosnowskyi* was most evident on *Aphelenchus*, *Tylencholaimus*, *Geocenamus*, *Helicotylenchus*, *Pratylenchus*, *Tylenchorhynchus* and *Aporcelaimellus*. Our results indicate that significant changes in the herbaceous layer after *H. sosnowskyi* invasion in ecosystems where *H. sosnowskyi* eventually became dominant (non-cultivated line between agricultural field; route edge and alluvial meadow) impacted soil-nematode communities but did not affect nematode diversity. This was in contrast to the habitats where a solitary plant of *H. sosnowskyi* grew (wet dump ground depression) and no significant changes in nematode communities were observed.

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