ABSTRACT

This work is an ecological characterisation of soil seed banks occurring in oak-hornbeam ecosystems within the Niecka Nidzianska macro-region. Up to now unexplored seed banks have been observed in oak-hornbeam forests growing on diverse substrates (sulphate rendzina - Grabowiec, calcareous rendzina - Polichno, loess - Kołków). In this paper, the basic parameters of seed banks, i.e., size (density/m^2), species richness, relationships with the undergrowth, species diversity, species frequency, are presented for each of the studied sites. The seed bank was also characterised based on aggregated data from all sites taken together. The seed bank assessment also included an analysis of the proportion of life forms and the distinguished ecological groups (forest species, old forest species, weedy and alien species and species of other opened plant communities).

The study also raises the question on the extent to which strict reserve protection affects the selected parameters of the seed bank. The size, species structure and similarity with the undergrowth of patches of usable forest and strictly protected forest growing in one forest complex, Grabowiec, were compared. The issue of how much influence on the degree of disturbance of the forest patch regarding the size and species richness of the seed bank, which often appears in the literature, was also analysed. In all sites, seed banks in shaded, undisturbed forest patches were compared with seed banks of oak-hornbeam patches with good light access to the forest floor.

In order to respond to the hypotheses in the ecological literature which assumes that seed banks are a type of regeneration strategy characteristic of light-living species with low seed mass, functional traits of species such as lightness (according to Ellenberg scale), seed mass (seed classes according to Grim et al. 2007) and persistence of seed species in the soil (according to Thompson et al. 1997, Jankowska-Błaszczuk 2000, Grimie et al.2007) which all were analysed in the second part of the study. All species recorded in the research were divided into the following three types: B - occurring only in the seed bank, BR - occurring in the seed bank and undergrowth, and R - occurring only in the undergrowth, and for each of these types the variation in the distribution of species with different lightness, seed weight and persistence was assessed.

The results showed that the seed banks of the Ponidzie oak-hornbeam forests are characterised by: lower density and lower diversity in comparison with the oak-hornbeam forests of the Białowieża Primeval Forest Reserve. They are built mainly by forest species with a high proportion of old forest species and a relatively high proportion of weed species, whose seeds in the soil bank were recorded with a low frequency. My thesis that assumes that a high

proportion of low mass and high photoblastic species in seed banks were confirmed. Seed banks were found to be much more numerous in disturbed patches with good light access to the forest floor. Overall, Ponidzie seed banks are characterised by low similarity to the forest floor and a high proportion of species forming persistent and long-term persistent seed banks. The data from the work presented clearly shows that the seed banks of Ponidzie's oak-hornbeam forests are unable to reproduce the rich species composition of the undergrowth of these thermophilous communities.