Diversity of ancient forest plant species in country parks

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Abstract: Forests fragmentation process was observed in many countries so plant species had to adopt on different habitat for them for example country parks. Country parks sometimes are the last objects, where forest plant species can grow in agricultural areas. The main purpose of the article was characteristic of ancient forest plant species diversity in country parks of Sandomierska Basin.

Key words: ancient forest plant species, diversity, country park.

INTRODUCTION

Agricultural landscape is still modified by human. Forests fragmentation process was observed in many countries so plant species had to adopt on not typical habitat for them as field areas or new forests (Peterken and Grame, 1984; Dzwonko, 1993; Eriksson, 1995; Wulf, 1997, 2003, 2004; Brunet and von Oheimb, 1998a, b; Lewesson et al., 1998; Bossuyt et al., 1999; Bossuyt and Hermy, 2000; Graae and Sudne, 2000; Jacquemyn et al., 2001; Verheyen et al., 2003b; Vellend, 2003, 2004b; Flinn and Vellend, 2005; Honnay et al., 2005; Vellend and Verheyen, 2006). Probably ancient plant species could also colonized in country parks which are “green islands” in agricultural landscape (Fornal-Pieniak and Wysocki, 2007).

The main aim of the article was characteristic of ancient forest plant species diversity in country parks of Sandomierska Basin. For practical purposes formulated list of ancient plant species could be useful for proposed directions of country parks renovation.

MATERIAL AND METHODS

Research was done in 2004–2005 in country parks on Sandomierska Basin in Poland. Parks were established in XVIII and XIX centuries on oak-hornbeam site on the minimum area of 2 ha. 51 country parks were divided based on area and antropic pressure. It was distinguished big (above 6 ha), medium (from 6 ha to 4.1 ha), small (from 4.0 ha to 2.0 ha) parks with antropic pressure and without antropic pressure.

It covered 101 phytosociological records on the area 500 m² in herb layer of country parks (Dzwonko, 2007). Flora

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1 Ancient forest plant species – plant species which are characteristic for ancient woodland (above 200 year old) and old woodlands (200–100 years old) according to Wulf (2003).

analysis included frequently (in %) and living forms classification (Raunkiaer, 1934), of forest species which are called ‘ancient plants’.

RESULTS AND DISCUSSION

It was observed ancient forest plant species characteristic for ancient and old forest in all country parks. The highest number of ancient forest species was in parks without antropic pressure (30 plant species in big objects, 24 plant species in medium objects and 21 plant species in small objects). Ancient plants were growing also in objects with antropic pressure. It was 20 plant species in big parks, 14 plant species in medium parks and 18 plant species in small objects with antropic pressure (Fig. 1). Most of the ancient forest plants were represented by *Gagea lutea*, *Galeobdolon luteum*, *Milium effusum*, *Oxalis acetosella*, *Poa nemoralis*, *Stellaria holostea*, *Tilia cordata*, *Viola mirabilis*, which had the highest frequently in country parks. Ancient plant species were represented by 5 living forms classification: hemicyryptophytes, geophytes, phanerophytes, chamaephytes, therophytes. Hemicyryptophytes and geophytes were dominated in all country parks (Fig. 2). Hemicyryptophytes were represented by *Asarum europaeum*, *Milium effusum*, *Pulmonaria obscura*, *Stachys sylvatica*, *Circaea lutetiana*. The highest frequently of hemicyryptophytes were in big country parks without antropic pressure (14 species). Moreover geophytes for example *Anemone nemerosa*, *Corydalis cava*, *Mercurialis perennis*, *Gagea lutea* and phanerophytes: *Acer campestre*, *Corylus avellana*, *Tilia cordata*, *Ulmus laevis* were dominated in big objects without antropic pressure, too. In all of the stands the chamaephytes were represented by *Galeobdolon luteum* and *Stellaria holostea*. Herbaceous species, as the therophytes were observed only in medium country parks (Table 1).

Forest plants colonization process mostly depended on time, typeuse of land and history (Peterken and Grame, 1984; Flinn and Vellend, 2005; Honnay et al., 2005). Woodland fragmentation could begin extinction debt, which cause low plants diversity in herb layer (Tilman et al., 1994). Nowadays plants diversity in new forest (100–200 years) is still lower than in ancient ones. Forest species diversity mostly depend on forest management, too. Most of ancient plant...
species tolerant stress, so they could occur on habitat with antropic pressure (Wulf, 2003) for example country parks. The highest frequently hemicryptophytes and geophytes is on oak-hornebeam forest with low or without antropic pressure (Honnay et al., 2005). The same results were observed in country parks. Nowadays ancient and old forests do not take a large areas so ancient plant species should be protected in country parks. Moreover country parks as “green islands” (Fornal-Pieniak and Wysocki, 2007) have important role as important elements of green corridors on non-forestry agricultural landscape.

**CONCLUSIONS**

1. Number of ancient forest species depend on area of parks.
2. Hemicryptophytes and geophytes were dominated in parks, because they are characteristic for oak-hornbeam site.
3. Ancient plants colonization process mostly depended on type of parks
objects without antropic pressure and objects with antropic pressure).

REFERENCES


**Streszczenie:** Zróżnicowanie gatunków starych lasów w parkach wiejskich. Proces fragmentacji lasów został zaobserwowany w wielu krajach. Różnorodność gatunkowa roślin, zwłaszcza warstwy runa zasta zaburzona przez działalność.
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MS. received February 2009
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człowieka. Rośliny, przede wszystkim gatunki starych lasów (ancient forest species) musiały zaadaptować się w nowych warunkach siedliskach np. nowe lasy, w zadrzewieniach na terenach rolniczych lub parkach wiejskich. Celem pracy jest określenie zróżnicowania gatunków starych lasów w parkach wiejskich Krainy Kotlina Sandomierska. Wyniki badań wykazały, iż liczba gatunków starych lasów wynosi od 14 do 30 w badanych obiektach. Różnorodność gatunkowa roślin starych lasów zależy od wielkości powierzchni parków, jak i intensywności pielęgnacji zadrzewień parkowych.