

DENDROFLORA OF THE “WSCHÓD” ESTATE IN ŚWIDNIK (LUBLIN VOIVODESHIP) – NATURE AND LANDSCAPE ANALYSIS

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Abstract. The research presented in this paper concerns the diversity and spatial structure of town green areas. Its goal was to compare the dendroflora of the “Wschód” estate in Świdnik with similar urban architectural complexes that have been analysed thus far. The purpose of this research was also to compile an inventory and to determine the species diversity of trees and shrubs that grow within the estate, as well as to indicate their composition and spatial function.

Key words: urban green areas, housing estate, inventory, trees, shrubs, species diversity.

INTRODUCTION

In recent years there has been an increased interest in the vegetation of modern cities. The importance of urban green areas, as well as the necessity to develop and conserve it is acknowledged not only by naturalists, but also by urban planners and architects. Therefore it is important to examine the vegetation, which is a vital part of the spatial structure of urban complexes.

This study is a continuation of several years of analyses of the role of green areas in cities, carried out by the researchers from the Institute of Landscape Architecture at The John Paul II Catholic University of Lublin. The previous studies focused only on the housing estates of Lublin. In this study the examined area was the “Wschód” housing estate in Świdnik, and its purpose was to determine the species diversity of the dendroflora observed there. Another goal was to investigate its compositional-spatial arrangement and compare the obtained results with data from the studies of Lublin estates.

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MATERIAL AND METHODS

Inventory research was carried out in the spring and summer of 2013 within the area of administrative boundaries of the “Wschód” housing estate in Świdnik. During that study a dendrological inventory method was used that involved a physical inventory of all the trees, shrubs and climbers. Botanic nomenclature was adapted from Seneta and Dolatowski [2002].

The “Wschód” housing estate (previously called “Sławińskiego-Wschód”) was constructed from 1979 to 1995 in the eastern part of Świdnik. Its founding was a response to an increasing need for new flats due to a dynamic development of the city and the WSK PZL Świdnik factory. The area of the estate encompassed close to 18 ha between Kosynierów Street in the West, Gen. M. Smorawińskiego Street in the South, Armii Krajowej Street in the East, and Gen. S. Maczka in the North. All of the buildings represent multi-family housing with a maximum of five floors. The dendroflora of the analysed terrain dates back to the time when the estate was established, and is complemented with new few-year-old plantings mostly performed by the inhabitants of the estate, on their own accord.

RESULTS

The research carried out in the “Wschód” estate area resulted in an inventory of 127 species and 33 varieties of trees, shrubs, climbers. The vegetation of the analysed estate was divided into five groups: broad-leaved trees, coniferous trees, broad-leaved shrubs, coniferous shrubs, and climbers. The greatest number of taxa (54 species and 9 varieties) was found in the group of broad-leaved shrubs. Broad-leaved trees included 41 species and 9 varieties, and coniferous trees – 17 species and 3 varieties. The fourth group consisted of coniferous shrubs, among which 9 species and 12 varieties were found. Within the analysed area 5 species of climbers were observed (Fig. 1).

The broad-leaved plants of the “Wschód” estate include 55 genera from 29 families, whereas coniferous plants – 9 genera from 3 families. Among the inventoried plants 86 species were of non-indigenous origin, which equals 67,7% of the total number, the remaining species are indigenous species, which equals 32,3% (Fig. 2).

Analyses of the area allowed a conclusion that the dendroflora of the “Wschód” in Świdnik consists of 64 genera from 32 families. The largest amount of genera, i.e. 12 (*Aronia*, *Chaenomeles*, *Cotoneaster*, *Crataegus*, *Kerria*, *Malus*, *Physocarpus*, *Potentilla*, *Prunus*, *Rosa*, *Sorbus*, *Spiraea*) came from the rose family.

Furthermore family abundant in species in the analysed area is the rose family (*Rosaceae* – 35 species). It is followed by the pine family (*Pinaceae* – 15 species), honeysuckle family (*Caprifoliaceae* – 11 species), cypress family (*Cupressaceae* – 10 species), and olive family (*Oleaceae* – 7 species). The genera with a greatest amount of species are: *Prunus* spp. (8 species), *Juniperus* spp. (7 species), *Lonicera* spp. (6 species).

There were 3711 specimens of trees, shrubs, and climbers in the “Wschód” estate area in Świdnik. The largest group of specimens consisted of broad-leaved shrubs. There were 2297 of these in the inventory. Also numerous were broad-leaved trees, which included

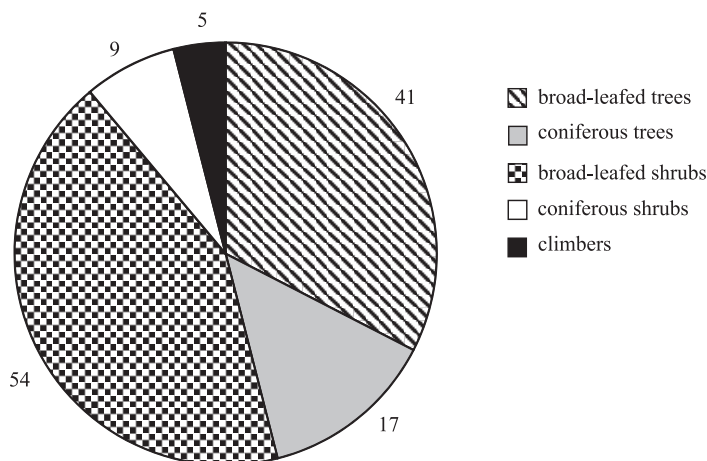


Figure 1. Amount of species in individual groups of dendroflora

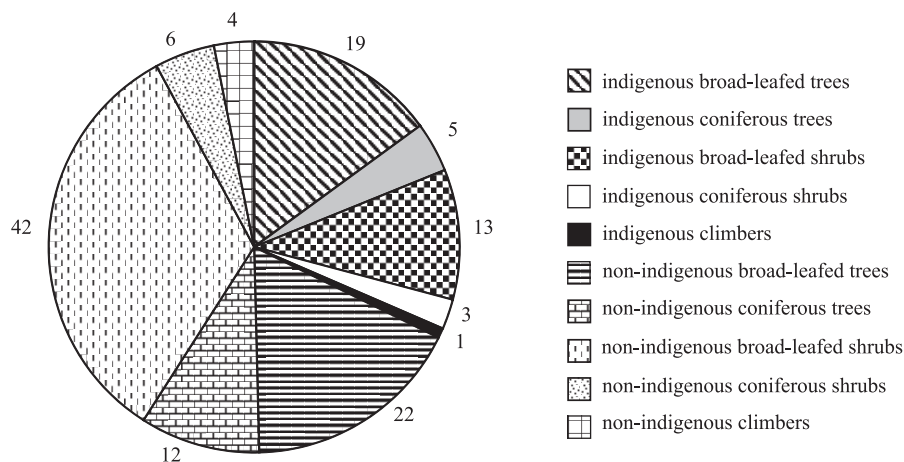


Figure 2. Amount of indigenous and non-indigenous species

1043 specimens. Coniferous trees and coniferous shrubs were visibly less numerous. The inventory included 257 coniferous trees and 78 coniferous shrubs (Fig. 3). What is more, hedges are an important element of greenery of the "Wschód" estate in Świdnik. They reach a total length of 1870 m. The majority of hedges found in the analysed area are monospecies and artificial in character. The species that are used as hedges most often are: shiny cotoneaster (*Cotoneaster lucidus* – 638,5 m), shrubs from the *Prunus* genus (555,5 m), as well as wild pivot (*Ligustrum vulgare* – 390,5 m).

Most common species of trees included: rowan (*Sorbus aucuparia* – 147), horse-chestnut (*Aesculus hippocastanum* – 98), as well as Norway spruce (*Picea abies* – 94). Shrubs were represented by: lilac (*Syringa vulgaris* – 308), border forsythia (*Forsythia x intermedia* – 257), and snowberry (*Symphoricarpos albus* – 177).

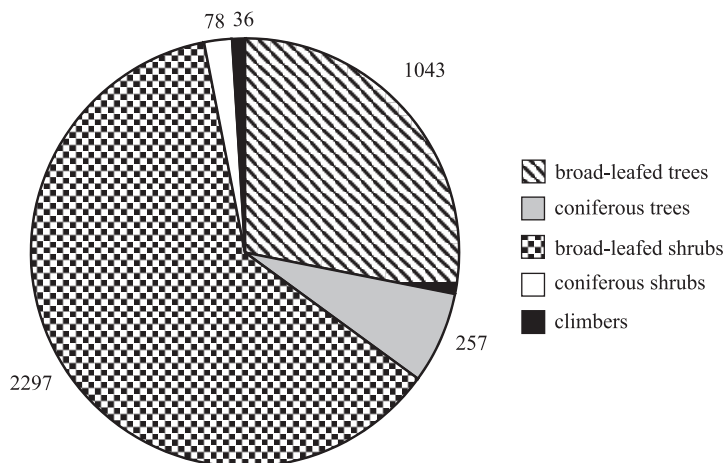


Figure 3. Amount of plant specimens in individual groups

The greenery inventoried in the area of “Wschód” estate in Świdnik is characterised not only by a rich variety, but also a complex compositional-spatial arrangement. Its complex structure is influenced by large spaces between residential buildings that form numerous estate interiors complemented with vegetation. There one can find linear plantings represented by alleys, lines of trees and hedges that highlight traffic routes. The two latter forms of vegetation also encompass car parks and designated areas for waste containers, reducing their negative influence. However, the analysed area also includes other objects, technical in nature, that are not hidden by vegetation. These include water pumping stations and transformer substation buildings, that should be hidden with greenery.

The problem of hedges and tree lines is their improper maintenance and evidence of many years of neglect and vandalism. There are significant gaps in their continuity, as well as evidence of too frequent rejuvenation pruning, which makes them too short and delicate. Linear arrangements of broad-leaved trees show signs of high levels of soil salinity and pest activity. Instead of decorating, the damaged trees spoil the view and are quite often eradicated at the request of the estate administration. Results of such actions are gaps in linear arrangements that lead to deformations of the spatial structure of the estate interiors. Alley arrangements are hardly present, however their condition is satisfactory. Despite their imperfections, linear plantings present in the “Wschód” estate provide a spatial framework, shape views, and provide variety to lawn compositions.

Another group of plants includes trees and shrubs that form loose clusters and tight groups. They play a highly decorative role under balconies and windows, in the spaces between building entrances, as well as form individual plantings on lawns. They do not present a distinct compositional arrangement, and their condition varies. Next to healthy specimens, one can observe deformed and stunted forms. The most common problem is the lack of proper maintenance, and lack of complementing the old plantings with new ones. A positive, noteworthy example is the initiative of the residents who, using

their own resources, complement the greenery of the estate. In most cases they form groves of shrubs, short trees or climbers around their balconies or building entrances. Unfortunately, they often underestimate the sizes of the plants that sometimes grow too large and cast shadows on windows. One of the consequences of such actions is improper pruning of branches, leading to deformations of the habit of trees and shrubs. Another issue is the inaccurate selection of species or varieties in relation to the surrounding habitat conditions, leading to hindered development and poor health of these plants.

The least common form of vegetation are individual trees and shrubs. An example of such a solution is the individual, branchy specimen of hornbeam (*Carpinus betulus* L.) situated in the centre of the lawn behind the building 6B in Kosynierów Street. Individual trees and shrubs with beautiful habit are a wonderful scenic accent that draws attention. It is especially visible in the summer period when such specimens' shadows contrast with the sun-lit lawn, highlighting their decorative qualities.

Dendroflora of the analysed estate is not homogenous. From the spatial point of view, the south-western part, near Smorawińskiego and Hallera Streets distinguishes itself from the rest. In the remaining sections of the estate one can find less trees and shrubs and their distribution is far more scattered. An interesting location, visibly distinctive from the remaining structure of the estate is the vegetation surrounding the building 10A in Kosynierów Street. Residents of this block of flats constructed a garden full of coniferous and broad-leaved plants in numerous decorative varieties.

Visible across the spatial structure of the estate is a considerably small amount of squares and lawns of recreational nature. There are locations with a spatial arrangement that suggests such concepts, however, they lack benches and other elements accentuating a recreational function.

DISCUSSION

Research carried out to date presents the importance of vegetation in shaping of natural, landscape, social, and economical qualities of cities [Wejchert 1984; Luttik 2000; Moranco 2003; Chiesura 2004; Bazan-Krzywoszańska 2005; Sutkowska 2006; Widomska-Piesik 2007; Tzoulas et al. 2007; Prądyńska and Śmielak 2009; Urbański et al. 2009; Czekiel-Świtalska 2010]. It is especially vital in the case of residential estates [Janiszewska et al. 2011; Klimko et al. 2004; Sitarski 2008; Lis 2009; Sitarski et al. 2011; Stopa-Boryczka et al. 2011; Mackoś-Iwaszko et al. 2013].

Having analysed the dendroflora of the "Wschód" housing estate in Świdnik, one can state that it is dominated by shrubbery complemented with trees. The variety of plant species of the "Wschód" estate influences the living conditions of its residents, especially since it is a multi-family real estate. However, species variety does not guarantee spatial variety or diversity of the compositional arrangement of greenery. The species diversity of the "Wschód" estate is similar to the analysed housing estates of Lublin. However, the spatial arrangement of dendroflora of this estate is simpler, and the quantity of plants is smaller. It should also be stressed that the area of the "Wschód" estate is dominated by species different from those in the Lublin housing estates (*Sorbus*, *Aesculus*, *Picea*). Only the trees from the *Sorbus* genus are numerous in almost all of the analysed estates

[Przesmycka and Sosnowska 2007, Przesmycka et al. 2010, Przesmycka and Sosnowska 2010, Mackoś-Iwaszko et al. 2013].

The simplicity of compositional arrangement of the “Wschód” housing estate in Świdnik is especially visible when compared to the Mickiewiczza estate in Lublin, which is unique due to its compositional-spatial arrangement based on the concept of a garden. What is more, the Mickiewiczza estate shows the best ratio between urban green areas and its total area, which is confirmed by the inventory of its vegetation prepared by Sosnowska [2008]. The unique character of the Mickiewiczza estate is due to the fact that it was the first housing estate in Lublin, and while constructing it the architect, Feliks Haczewski, was given significant freedom of design [Springer 2013]. Therefore, comparing the Mickiewiczza estate to the ones built later is quite problematic. For instance, the Hansens, who later designed a housing estate for the Lublin Housing Cooperative – the J. Słowackiego estate – had significantly less funds and space to utilise [Springer 2013].

In terms of species diversity, the “Wschód” housing estate in Świdnik is similar to the XXX-lecia estate in Lublin, however in terms of quantity of specimens, it is not as rich. It is due to the fact that the estate in Lublin has a far more diverse relief and there are numerous trees and shrubs densely covering the slopes that surround it [Mackoś-Iwaszko et al. 2013]. The Świdnik estate, on the other hand, is situated on a flat terrain and lacks spaces that could be densely covered with trees.

CONCLUSIONS

The research described in this article showed a vast species diversity of the “Wschód” estate dendroflora. It is visible in the amount of the inventoried trees and shrubs (3711 specimens) and taxa (127 species and 33 varieties). However, in comparison to the XXX-lecia and Mickiewiczza estates in Lublin, the spatial structure of green areas is less complex. It may be due to the fact that throughout recent years green areas of the “Wschód” estate have ceased to be treated with proper care, probably as a consequence of financial problems. Minimal maintenance and lack of thorough plans for dendroflora revitalisation caused a decrease in the number of specimens and in the spatial arrangement. Nonetheless, the vegetation remains an important element of the estate, increasing its visual and landscape value. Vast estate interiors provide an opportunity for improvement in the form of gradual but constant process of green areas modernisation such as replanting, re-composition and proper maintenance of the vegetation.

REFERENCES

- Bazan-Krzywoszańska, A. (2005). Polityka przestrzenna a tereny zielone na przykładzie miasta Zielona Góra. *Teka Kom. Arch. Urb. Stud. Krajobr.* – OL PAN, I, 119–127.
- Chiesura, A. (2004). The role of urban parks for the sustainable city. *Landscape and Urban Planning*, 68(1), 129–138.
- Czekiel-Świtalska, E. (2010). Rola zieleni w mieście na przykładzie centrum Szczecina. *Przestrzeń i Forma*, 13, 165–182.

- Janiszewska, A., Klima, E., Rochmińska, A. (2011). Jakość życia na łódzkich osiedlach. *Space – Society – Economy*, 10, 145–179.
- Klimko, M., Górski, P., Górna, L. (2004). Dendroflora Międzyzachodu. *Rocz. AR Pozn. CCCLXIII, Bot.*, 7, 95–108.
- Lis, A. (2009). Rola dendroflory w utrzymaniu charakteru i trwałości osiedla Sępólno we Wrocławiu. *Czas. Techn. 9, Budownictwo, B-2*, 217–231.
- Luttik, J. (2000). The value of trees, water and open space as reflected by house prices in the Netherlands. *Landscape and Urban Planning*, 48(3–4), 161–167.
- Mackoś-Iwaszko, E., Lubiarski, M., Kulesza, P. (2013). Drzewa i krzewy osiedla XXX-lecia w Lublinie (południowo-wschodnia Polska) jako przykład bogactwa gatunkowego roślinności miejskiej. *Episteme*, 20(2), 73–82.
- Morancho, A.B. (2003). A hedonic valuation of urban green areas. *Landscape and Urban Planning*, 66(1), 35–41.
- Prądyńska, D., Śmielak, Ł. (2009). Rozmieszczenie przestrzenne terenów zieleni miejskiej w Słupsku. *Słupskie Prace Geograf.*, 6, 207–214.
- Przesmycka, E., Boguszewska, K., Przesmycka, N. (2010). Współczesna przestrzeń publiczna wyrazem potrzeb lokalnej społeczności na przykładzie skweru im. Matki Boskiej Fatimskiej na Osiedlu Bronowice w Lublinie. *Teka Kom. Arch. Urb. Stud. Krajobr. – OL PAN*, VI, 230–239.
- Przesmycka, E., Sosnowska, M. (2007). Przeobrażenia układów zieleni osiedlowej na przykładzie zespołu im. Adama Mickiewicza Lubelskiej Spółdzielni Mieszkaniowej. *Czas. Techn.*, 10, Architektura, 5-A, 73–75.
- Przesmycka, E., Sosnowska, M. (2010). Stan zachowania przestrzeni publicznych osiedli mieszkaniowych z lat 50 XX w. na przykładzie Lublina. *Teka Kom. Arch. Urb. Stud. Krajobr. – OL PAN*, VI, 47–55.
- Seneta, W., Dolatowski, J. (2002). *Dendrologia*. Wydawnictwo Naukowe PWN, Warszawa.
- Sitarowski, M. (2008). Charakterystyka warunków glebowych i szaty roślinnej w wybranych osiedlach mieszkaniowych Warszawy. *Człowiek i Środowisko*, 32(1–2), 19–41.
- Sitarowski, M., Buszman, S., Jabłońska, A. (2011). Ocena funkcjonowania zieleni w wybranym osiedlu mieszkaniowym Warszawy – Próba zastosowania analizy SWOT. *Człowiek i Środowisko*, 35(3–4), 67–90.
- Sosnowska, M. (2008). Modernizm powojenny na przykładzie wybranych Lubelskich spółdzielczych osiedli mieszkaniowych z lat 60. i 70. XX wieku. *Teka Kom. Arch. Urb. Stud. Krajobr. – OL PAN*, VIb, 203–211.
- Springer, F. (2013). *Zaczyn. O Zofii i Oskarze Hansenach*. Wydawnictwo Karakter – Muzeum Sztuki Nowoczesnej w Warszawie, Kraków–Warszawa.
- Stopa-Boryczka, M., Boryczka, J., Wawer, J. (2011). Wpływ zabudowy i zieleni osiedlowej na zróżnicowanie klimatu lokalnego w Warszawie. *Prace i Studia Geograf.*, 47, 373–381.
- Sutkowska, E. (2006). Współczesny kształt i znaczenie zieleni miejskiej jako zielonej przestrzeni publicznej w strukturze miasta – przestrzeń dla kreacji. *Teka Kom. Arch. Urb. Stud. Krajobr. – OL PAN*, 184–192.
- Tzoulas, K., Korpela, K., Venn, S., Yli-Pelkonen, V., Kaźmierczak, A., Niemela, J., James, P. (2007). Promoting ecosystem and human health in urban areas using Green Infrastructure: A literature review. *Landscape and Urban Planning*, 81(3), 167–178.
- Urbański, P., Krzyżaniak, M., Rydzewska, A. (2009). Zieleni Poznania i innych miast w Polsce. *Nauka Przyr. Technol.*, 1(3), 1–10.
- Wejchert, K. (1984). *Elementy kompozycji urbanistycznej*. Arkady, Warszawa.
- Widomska-Piesik, J. (2007). Zieleni w strukturach miejskich zabudowanych. *Czas. Techn.*, 10 Architektura, 5-A, 251–253.

DENDROFLORA OSIEDLA „WSCHÓD” W ŚWIDNIKU (WOJ. LUBELSKIE) – ANALIZA PRZYRODNICZA I KRAJOBRAZOWA

Streszczenie. Przedstawione badania dotyczą różnorodności i struktury przestrzennej zieleni miejskiej. Mają one na celu porównanie dendroflory osiedla mieszkaniowego „Wschód” w Świdniku z innymi podobnymi zespołami urbanistycznymi, które były dotychczas przeanalizowane. Niniejsze badania miały charakter inwentaryzacyjny i służyły określeniu różnorodności gatunkowej rosnących tam drzew i krzewów, a także wskazaniu ich funkcji kompozycyjno-przestrzennej.

Słowa kluczowe: zieleń miejska, osiedle mieszkaniowe, inwentaryzacja, drzewa, krzewy, różnorodność gatunkowa

Accepted for print – Zaakceptowano do druku: 2.09.2015

For citation: Lubiarz, M., Kulesza, P. (2015). Dendroflora of the “Wschód” estate in Świdnik (Lublin voivodeship) – nature and landscape analysis. *Acta Sci. Pol., Formatio Circumiectus*, 14(3), 85–92.