

Local clusters of anthropophytes and their migration in the 'Murcki Forest' nature reserve (The Silesian Upland)

Stanisław Wika & Monika Gorczyca

Department of Geobotany and Nature Protection, Faculty of Biology and Environmental Protection, University of Silesia, Jagiellońska 28, 40-032 Katowice, Poland, e-mail: swika@us.edu.pl

Abstract: This paper presents the results of the studies on the occurrence and distribution of alien species in the 'Murcki Forest' nature reserve, located in the city of Katowice. Most of the 26 recorded anthropophytes was found along forest roads and paths. Some alien species were noted on the edges of the nature reserve and in habitats associated with illegal rubbish dumps. Some, such as *Aesculus hippocastanum*, *Impatiens parviflora*, *Padus serotina*, *Parthenocissus inserta*, *Pinus strobus*, *Quercus rubra*, *Ribes rubrum*, and *Robinia pseudoacacia*, invaded into the interior of the forest. The most invasive species occurring quite strongly represented in typical forest habitats is *Impatiens parviflora*.

Key words: flora, anthropophytes, nature reserve, the Silesian Upland

1. Introduction

There are 61 nature reserves within the territory of the Silesian Province. Most of them protect forest communities. The nature reserves situated within urban and industrial areas are especially exposed to anthropopressure. One of them is the 'Murcki Forest' nature reserve located in the city of Katowice. It was created in 1953 in order to preserve a fragment of mixed forest with natural characteristics. In 1989 its area was increased from 7.04 ha to 102.56 ha. Nowadays the reserve consists of two parts which are separated by a four-lane fast road Katowice-Bielsko-Biała (Celiński *et al.* 1991; Tokarska-Guzik 1994).

The acidophilous beech wood *Luzulo pilosae-Fagetum* predominates in the 'Murcki Forest' nature reserve. The 150-220 year old grand beeches which grow in the reserve are a remnant of the former Silesian Primeval Forest (Wika & Cabała 1994). Another advantage of the area, apart from its natural values, is its landscape. However, the reserve is influenced by strong anthropopressure, mainly because of the immediate vicinity of an urban agglomeration. Not long ago further anthropogenic changes have been by five coal mines (Wika *et al.* 1994). The enhanced traffic related to the presence with the Katowice-Bielsko road is a source of noise, air pollution and heavy metal contamination, which influence especially the parts of the reserve

adjacent to the motorway. The activity of the 'Wesoła' coal mine led to the ground depression and partial water flooding in the south-eastern parts of the reserve.

Because of the prolonged exposure to air pollution, the forests of the reserve are in the second zone of damage. The increasing penetration of the reserve by people causes degenerative changes in its natural environment as well (Tokarska-Guzik 1994).

The aim of this study was to compile a list of alien species occurring within the 'Murcki Forest' nature reserve and prepare a map of their distribution within the examined area.

2. Material and methods

A field study was carried out in the years 2003-2004. The data collected during the research were supplemented by published information. The terminology of anthropophytes follows Mirek *et al.* (2002). The geographic-historical classification of species is based on the division presented by Kornaś & Medwecka-Kornaś (2002) and Zajac *et al.* (1998).

3. Results

As a result of floristic investigation a total of 26 species of anthropophytes were identified within the examined nature reserve.

Among alien species kenophytes were the most numerous group (16 species); archaeophytes (5 species) and ergasiophytes (4 species) were less numerous. Most anthropophytes (17 species) occurred along forest paths and roads. Some alien species (12) were noted on the edges of the reserve. Three kenophytes (*Aesculus hippocastanum*, *Impatiens parviflora* and *Solidago canadensis*) were found in places where refuse and debris are illegally dumped. Some, such as *Aesculus hippocastanum*, *Impatiens parviflora*, *Padus serotina*, *Parthenocissus inserta*, *Pinus strobus*, *Quercus rubra*, *Ribes rubrum*, and *Robinia pseudoacacia*, penetrated into the interior of the forest (Table 1).

Galinsoga ciliata, *Oxalis fontana*, *Reynoutria sachalinensis*, *Spiraea japonica*, *Solidago canadensis*, and *Symphoricarpos albus*). Their presence in the reserve can indicate that synanthropisation of its flora is in progress. There is a need for further floristic studies to confirm that this negative process is permanent. On the other hand, the occurrence of 2 alien species (*Crataegus coccinea* L. s.l., *Senecio vulgaris* L.) noted by Rostański & Tokarska-Guzik (1994) was not confirmed by the authors.

The main reason for penetration of the flora of the examined reserve by anthropophytes is their invasion from the surrounding area. This process is especially

Table 1. The types of habitats preferred by recorded anthropophytes

No.	Name of species	Geographic-historical groups	Type of habitat			
			Forest paths and roads	Forest edge	Typical forest habitat	Illegal rubbish dump
1	<i>Aesculus hippocastanum</i> L.	Kn	•	•	•	•
2	<i>Capsella bursa-pastoris</i> (L.) Medik.	Ar	•	-	-	-
3	<i>Cirsium vulgare</i> (Savi) Ten.	Ar	•	-	-	-
4	<i>Conyza canadensis</i> (L.) Cronquist	Kn	•	-	-	-
5	<i>Deutzia scabra</i> Thunb.	Er	-	•	-	-
6	<i>Galinsoga ciliata</i> (Raf.) S. F. Blake	Kn	•	-	-	-
7	<i>Impatiens parviflora</i> DC.	Kn	•	•	•	•
8	<i>Juncus tenuis</i> Willd.	Kn	•	-	-	-
9	<i>Lamium album</i> L.	Ar	•	-	-	-
10	<i>Melandrium album</i> (Mill.) Garcke	Ar	•	-	-	-
11	<i>Oxalis fontana</i> Bunge	Kn	•	-	-	-
12	<i>Padus serotina</i> (Ehrh.) Borkh.	Kn	•	•	•	-
13	<i>Parthenocissus inserta</i> (A. Kern.) Fritsch	Kn	-	•	•	-
14	<i>Philadelphus pubescens</i> Loisel.	Er	-	•	-	-
15	<i>Pinus strobus</i> L.	Er	-	-	•	-
16	<i>Quercus rubra</i> L.	Kn	•	•	•	-
17	<i>Reynoutria japonica</i> Houtt.	Kn	-	•	-	-
18	<i>Reynoutria sachalinensis</i> (F. Schmidt) Nakai	Kn	-	•	-	-
19	<i>Ribes rubrum</i> L.	Er	-	-	•	-
20	<i>Robinia pseudoacacia</i> L.	Kn	•	•	•	-
21	<i>Sinapis arvensis</i> L.	Ar	•	-	-	-
22	<i>Solidago canadensis</i> L.	Kn	-	-	-	•
23	<i>Solidago gigantea</i> Aiton	Kn	•	•	-	-
24	<i>Spiraea japonica</i> L.f.	Er	-	•	-	-
25	<i>Symphoricarpos albus</i> (L.) S. F. Blake	Kn	•	-	-	-
26	<i>Syringa vulgaris</i> L.	Kn	•	-	-	-

Explanations: Ar – archaeophyte; Kn – kenophyte; Er – ergasiophyte

4. Discussion

In literature (Rostański & Tokarska-Guzik 1994) there are no data concerning the occurrence of 7 alien species in the ‘Murcki Forest’ nature reserve which were found in this object by the authors (*Deutzia scabra*,

advanced in the smaller part of the reserve, where most alien species occur on the edges of the forest. It can be presumed that some species, such as *Deutzia scabra*, *Spiraea japonica* and *Parthenocissus inserta*, ‘sneaked’ into the reserve from the neighbouring old park. Many alien species have their sites in the immediate vicinity

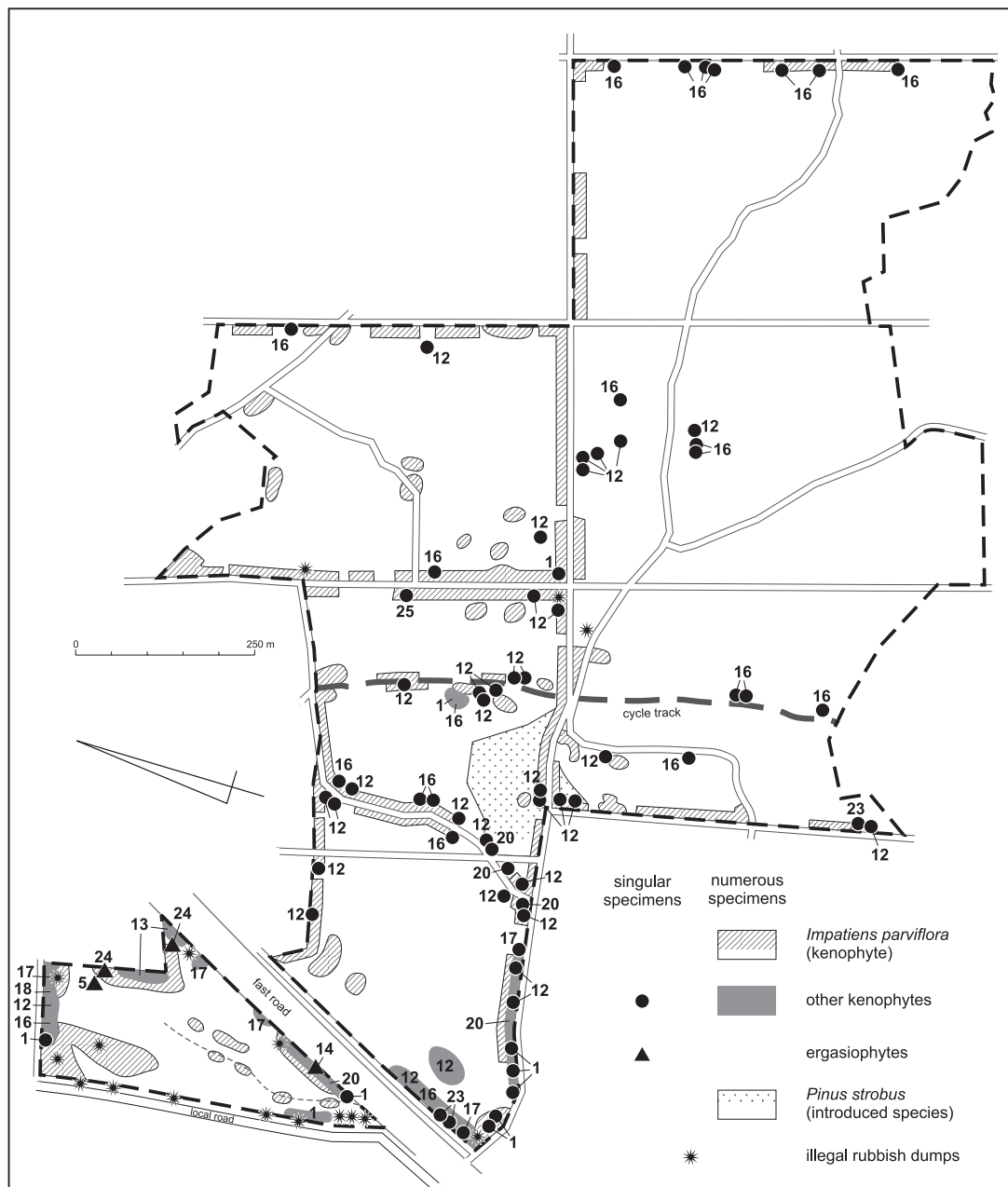


Fig. 1. Distribution of anthropophytes and illegal rubbish dumps in the 'Murcki Forest' nature reserve
 Explanations: 1 to 25 these are numbers of species in table 1

of the motorway and a local road, where there are a lot of illegal rubbish dumps.

In the larger part of the reserve alien species migrate along forest roads and paths, first of all in places where human penetration is highest. Far fewer anthropophytes were noted at the forest edge, especially in the part surrounded by a dense forest complex (Fig. 1).

The most invasive alien plant quite strongly represented in both parts of the reserve is *Impatiens parviflora*.

This species migrates along forest roads and paths, grows on the edges of the reserve and in habitats associated with illegal rubbish dumps. It also spreads in typical forest habitats, where it sometimes occurs in large numbers (Fig. 1).

Despite considerable synanthropisation of the plant cover, the reserve still has high natural and landscape value. It still performs important social and educational functions (Wika *et al.* 1994).

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