

FLORIAN ŚWIĘS

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Materials for the distribution and ecology of the mistletoe
(*Viscum album* L. subsp. *album* P. W. Ball) in central-eastern
Poland. VII. Vicinity of Urzędów

Materiały do rozmieszczenia i ekologii jemioty pospolitej typowej (*Viscum album* L.
subsp. *album* P. W. Ball) w środkowo-wschodniej Polsce. VII. Okolice Urzędowa

SUMMARY

The structure of spatial distribution and ecological properties mistletoe (*Viscum album* L. subsp. *album* P. W. Ball) were studied in the area in the vicinity of the town of Urzędów, characterized for its general natural properties. In the region in question with the area of 59.6 km², 69 single and group stations of this plant were reported in 2000–2007 (Fig. 1). They are concentrated mainly in highly built-up sites next to roads, less often at small distances from them.

The mistletoe parasitizes here barely eleven host taxa (species and their varieties) representing trees only (Table 1). These are tree specimens, usually healthy, aged 40–60 years, mostly foreign to the Polish flora, seldom native ones. They grow basically as a result of plantings, usually in sites with sufficiently high insolation. They are found on soils of different types, from almost natural to typically anthropogenic ones, more often on dry or mesophilic, than on highly moistened. The main local mistletoe hosts include poplars of American origin (*Populus xeuroamericana*) in the varieties of 'Marilandica', 'Robusta' and the native linden (*Tilia cordata*).

Worth noting is the definite quantitative predominance of stations with scarce mistletoe specimens (e.g. Fig. 2, 6, 7) over the stations where this plant occurs in large numbers (e.g. Fig. 3, 4, 5).

It should be also emphasized that in the area investigated the mistletoe exhibits great expansion in the stations that are both settled and new ones. However, mistletoe stations are being successively partly or completely mechanically destroyed in various ways. This mainly results from cutting its hosts or harvesting this plant for decorative and curative purposes.

To date, similar features of the structure of spatial distribution of mistletoe stations and its ecological properties, dynamics and occurrence were reported in the vicinity of several towns in the central-eastern part of Poland.

STRESZCZENIE

Na scharakteryzowanym pod względem ogólnych właściwości przyrodniczych terenie w rejonie miasta Urzędowa zbadano strukturę przestrzennego rozmieszczenia i właściwości ekologicznych jemioli pospolitej typowej (*Viscum album* L. subsp. *album* P. W. Ball). W wymienionym regionie o powierzchni 59,6 km² stwierdzono w latach 2000–2007 69 pojedynczych i grupowych stanowisk tej rośliny. Zgrupowane są one głównie na żywicielach w miejscach silnie zabudowanych przy szosach, rzadziej w niewielkich odległościach od nich (ryc. 1).

Jemiola pasożytuje tu zaledwie na 11 taksonach żywicieli (gatunki i ich odmiany) reprezentujących wyłącznie drzewa (tab. 1). Są to okazy drzew zwykle zdrowe, liczące 40–60 lat, w naszej florze w większości obce, rzadziej rodzime. Rosną one zasadniczo w wyniku zasadzenia, zwykle w miejscach o dostatecznie dużym naświetleniu. Występują na glebach różnego typu, począwszy od prawie naturalnych po typowo antropogeniczne częściej suchych lub mezofilnych, niż na silnie uwilgotnionych. Do głównych miejscowych żywicieli jemioli należą topole amerykańskiego pochodzenia (*Populus xeuamericana*) w odmianach 'Marilandica', 'Robusta' i rodzima lipa (*Tilia cordata*).

Zwraca także uwagę zdecydowana ilościowa przewaga stanowisk z nielicznymi okazami jemioli (np. ryc. 2, 6, 7) nad stanowiskami, gdzie występuje ona licznie (np. ryc. 3, 4, 5).

Należy również podkreślić, że jemiola na badanym terenie wykazuje dużą ekspansję na stanowiskach zarówno zadomowionych (np. nr 19, 27, 29, 35, 48, 53, 60–69), jak i zupełnie nowych (np. nr 9, 12, 17, 20–23, 37, 42–47, 52, 54–58). Jednak jej stanowiska są sukcesywnie, w różny sposób mechanicznie częściowo lub całkowicie niszczone. Wynika to głównie z wycinania jej żywicieli oraz z pozyskiwania tej rośliny w celach dekoracyjnych i leczniczych (np. nr 7, 36, 41, 49, 50, 59).

Jak dotąd, podobne właściwości struktury przestrzennego rozmieszczenia stanowisk jemioli i jej właściwości ekologicznych, dynamiki i występowania opublikowano już z kilku miast w środkowo-wschodniej części Polski.

Keywords: Mistletoe (*Viscum album* L. subsp. *album* P. W. Ball), stations and ecology, Vicinity of Urzędów, Lublin Upland, Poland

INTRODUCTION

The mistletoe (*Viscum album* L. subsp. *album* P. W. Ball) in Poland is a generally common plant but with very uneven groupings of stations found from the Baltic coast as far as the lower parts of the Carpathian and Sudeten mountainsides (2, 25). Thorough-going studies on the distribution, biology and ecology mistletoe in domestic stations were carried out by Stypiński, sometimes with co-authors (18 and literature quoted therein). The existing data on the occurrence mistletoe in the region of Urzędów are very incomplete and vague (2, 4, 5, 6). To date, a similar range of studies on mistletoe occurrence as in the area of Urzędów were carried out in the vicinity of several towns in central-eastern Poland (20, 21, 22 and literature quoted therein). However, despite all the aforementioned studies of mistletoe ecology there is still no definitive explanation of the correlation between this plant and its spatial distribution, its stations with hosts, and other circumstances of its

occurrence (19). The mistletoe species in question belongs to the geographical element of the submeridional-Eurasian type, mainly of warmer temperate climatic zones (2, 7, 13, 18). It is seed-dispersed when its fruit ripens, mainly at small distances, and by certain bird species (18).

In the area investigated, like in other areas of central-eastern Poland, the mistletoe belongs to expansive plants, especially over the last ten years. On the other hand, the cases of mechanical destruction of its stations are growing more and more numerous. This is seen first of all in the cases of cutting its principal hosts that most often grow next to roads and among successively developed rural and urban housing estates. Mistletoe stations are also being destroyed because of the increasingly frequent harvesting of the plant for decorative or curative purposes and as an allegedly dangerous semiparasite on fruit trees. As a result of these causes, in the not so distant future, many naturally-sown mistletoe stations will be thinned out or entirely destroyed in Poland's plant landscape (19–22).

THE PURPOSE AND SCOPE OF STUDY

The purpose of the present study was to investigate the quantitative structure of the stations and ecology of the subspecies of mistletoe (*Viscum album* L. subsp. *album* B. W. Ball) in the area of the town of Urzędów and its closest vicinity. This is an area delimited for the study of mistletoe, in a rectangular form, covering 59.6 km². Field studies were carried out in 2000–2007. Attention focused on the basic physico-geographical and geobotanical properties of the investigated area. The main body of the study is concerned with the characteristics of all mistletoe stations located during the period of studies. When describing mistletoe stations, both the character of the accompanying buildings and trees, and the taxa with the number of host specimens, and the degree of being overrun by this plant were taken into account. The results of the study of mistletoe were presented in Fig. 1 and in Table 1, and summed up in the final chapter. The naming of the local mistletoe hosts was given after Seneta and Dolatowski (17).

Explanations of abbreviations and markings used in describing mistletoe stations.

The specification of letter markings of the eleven located host taxa is as follows:

A. *Acer platanoides* L.

B. *Acer saccharinum* L.

C. *Malus domestica* Borkh

DM. *Populus xeuamericana* (Dode) Guiner 'Marilandica'

DR. *Populus xeuamericana* (Dode) Guiner 'Robusta'

DS. *Populus xeuamericana* (Dode) Guiner 'Serotina'

E. *Populus symonii* Car.

F. *Robinia pseudacacia* L.

G. *Salix alba* L.

H. *Sorbus aucuparia* L.

I. *Tilia cordata* Mill.

The number given before particular host taxa (A–I) denotes the total number of its specimens. Numbers given after the mark "/" denote the number of mistletoe individuals on all single specimens of a particular host taxon.

THE AREA OF INVESTIGATIONS

Studies of the distribution and ecology of mistletoe were carried out in the areas belonging to the town of Urzędów and its close vicinity. They are situated in the south-western part of the Lublin province [voivodeship], the Urzędów *gmina* [commune]. Practically, this is an area, which was

delimited for investigation in a rectangular form covering 59.6 km² (Fig. 1). It takes into account the ATPOL grid squares, adopted for whole Poland, with sides of 10x10 km (25) nos.: FE 54/46-49, 57-59, 67-69, 87-89; FE 55/40-44, 50-54, 60-64, 70-74, 80-84. In geographical and geobotanical terms, the investigation area is situated in the south-western part of the Lublin-Lvov Upland [Wyżyna Lubelska], almost right in the central part of Urzędowskie Heights (3, 4, 12). Taking into consideration Poland's climatic regionalization, this is an area located in the so-called Lublin Region in its 52nd region (16).

Climatically, the surroundings of Urzędów are not distinguished in any way in the Lublin macroregion (8, 12, 13, 24, 26, 27). According to W. and A. Zinkiewicz (26) they are in the so-called Lublin-Chełm climatic domain (region). The actual level of mean annual temperature ranges from 7.6 to 7.8°C. The warmest month is July (with the average of 18.4°C), the coldest being January (4°C on average). Average annual precipitation ranges from 520 to 560 mm. Generally, the predominant winds are from SW and W. The vegetation period lasts here over 218 days. This is a region with comparatively low pollution of the environment. (9).

Morphologically, the Urzędów surroundings are a fairly characteristically formed upland area, situated 183-252 m above sea level (Fig. 1). Almost across the middle of the investigated area, almost latitudinally, in the locally most undulating upland, runs the fairly wide, wet valley of the Urzędówka river. However, north and south of this valley, slightly undulating upland plains predominate, with wooded ravines in places. The oldest substratum is made up of Tertiary rocks, covered with specific Quaternary deposits (3, 8, 15). The thickness of the predominant loess cover here is as deep as a dozen-odd m. In the river valleys, Holocene-Pleistocene alluvial soils predominate. Different forms of soils developed on loess and river alluvia (23, 24).

The majority of current and potential mistletoe hosts occur at major roads and in the closely adjacent highly built-up areas. These stations were recorded most often on anthropogenic mesophilic soils, usually dusty-sandy with different admixtures of gravel, plaster grains, brick, and concrete. They were found mainly next to the roads and within densely built-up sites in town and in the country. Sparse mistletoe stations occur on wet riverside alluvial soils or on mesophilic brown soils, as well as on rendzina soils. In the landscape of the investigated area, there is a spatial predominance of rural farming areas with scattered buildings, fruit orchards, and various field crops. Dense, extensive or small, scattered buildings concentrations are located mainly next to the roads. Generally, in the investigated area, the spatial density of buildings and roads is far higher in its central part (Urzędów) than in its periphery (nearby villages).

MISTLETOE STATIONS

1. Leszczyna, N part. Above the road, elevating the scarp slopes. The grove edge, mainly linden and poplar. 1DM/1.
2. Leszczyna, almost central part. Above the road, upper part of the ravine slope. A square between buildings, grassy, with scattered trees, mainly linden and ash tree. 1H/1.
3. Urzędów, Zakościelne suburb, extreme E part. Above the road, the scarp slope. The square next to a building, grassy, with scattered trees, mainly linden and poplar. 1DS/3.
4. Urzędów, Zakościelne suburb, extreme E part. Next to the road. A square next to buildings, with a dense, mainly robinia, poplar, and hazel grove. 1F/1.
5. Urzędów, Zakościelne suburb, SE part, ca. 150m from the road. At the building, on the edge of farmland. In an isolated row of several poplars. 1DS/1.
6. Urzędów, Zakościelne suburb, SE part, ca. 300m from the road. A ravine slope, xerothermic, irregularly shrub- and tree-covered. Among an isolated group of three poplars. 1DS/1.

7. Urzędów, Zakościelne suburb, E part. Several hundred m from the road. Between buildings, the edge of crop field, with scattered fruit trees. 1C/1.
8. Urzędów, Zakościelne suburb, E part. The edge of the Urzędówka river valley. Next to a building and the gmina road. In an isolated row of several poplars. 1DS/2.
9. Urzędów Góry, SW part. Next to a building and the road, at the foot of the scarp. The edge of a dense, mainly poplar and hazel grove. 1DM/1.
10. Urzędów, Zakościelne suburb, central-W part. On either side of the road, at its N side; next to a building. Among an isolated, sparse group of trees, mainly willows and poplars. 1G/1. On the S side of the road: the crust slope. Among buildings, a grassy square with an isolated linden. 1I/1.
11. Urzędów, Zakościelne suburb, NW part. Next to buildings, the edge of the wet Urzędówka river valley. A square with scattered single groups of trees, mainly poplar and linden. 1DS/3.
12. Urzędów, Zakościelne suburb, NW part. Near the road, below buildings. At the foot of the Urzędówka river valley. A dense, planted leafy grove, mainly hazel, poplar, and willow. 1DM/1.
13. Urzędów, Zakościelne suburb, SW part. Above the road, scarp slope. The square next to a building, with scattered sparse trees, mainly poplar and linden. 1I/1
14. Urzędów, Zakościelne suburb, SW part. Above the Podwałowa road. Near buildings, the edge of scarp ridge. The square of a garden run wild, with hazel shrub, fruit trees and a poplar. 1DR/1.
15. Urzędów, Zakościelne suburb, SW part. Above the road, the scarp slope, near buildings. A grassy square with scattered sparse trees, mainly linden and poplar. 1I/2.
16. Urzędów, Zakościelne suburb, SW part. Above the road, near buildings. The scarp slope with scattered, sparse trees, mainly poplar and linden. 1E/1.
17. Urzędów, near the church. Next to the road and church square. In an isolated several-specimen group. Among an isolated group of several lindens. 1I/2.
18. Urzędów. Market square, with scattered trees, mainly maple and apple-tree. 1C/1.
19. Urzędów, Wodne suburb, SE part. ca. 70 km from the road. Next to a building, over a stretch of 60 km from NW and S. Among isolated sparse tree groups, mainly poplar. 2+2DM/31, 1+1, 1.
20. Urzędów, Wodne suburb, SE part. Next to the road, in front of buildings, the square edge. In a sparse row of trees, mainly maple. 1A/1.
21. Urzędów, Wodne suburb, SE part. Ca. 80 km from the road. The edge of a plank storeyard square, with sparse scattered poplars. 1 DM/1.
22. Urzędów, Wodne suburb, SE part. On either side of the road, edges of farmland. Over a stretch of ca. 60 less dense and dense fragments of tree rows, mainly maple. On the W side of the road: 1A/1. On the E side of the road: 3A/5, 1, 1.
23. Urzędów, Wodne suburb, SW part, in the vicinity of the road. Cemetery, with sparse, scattered trees, mainly maple and linden. 1A/1.
24. Urzędów, Wodne suburb, NW part. Next to the road, between buildings. The edge of a square densely spruce-covered. On an isolated poplar. 1DS/26.
25. Urzędów, Wodne suburb, NE part. Several hundred m from the road. Next to a building, the edge of an orchard run wild. Among a not very dense group of trees, mainly poplar. 1DS/2.

26. Urzędów, Wodne suburb, NE part. Next to the road, between buildings. The square edge. In a not very dense tree row, mainly poplar and maple 1DM/1; 1A/1.
27. Urzędów, Wodne suburb, NE part. Next to the road, between buildings. The square edge. In a row of several trees, mainly linden. 3H/70, 3I/4, 15, 70.
28. Urzędów, Wodne suburb, NE part. Several hundred m from the road, next to a building. The edge of the wet Urzędówka river valley, densely tree- and shrub-covered, mainly with willow, poplar and linden. 1G/1.
29. Urzędów, Wodne suburb, NW part. The Urzędówka river valley, wet. Near the river, bridge and mill. In a scattered and dense tree concentration, mainly willow and poplar. 2DS/1, 1; 1G/1.
30. Urzędów, Wodne suburb, NW part. The Urzędówka river valley, wet. On the riverside, near the bridge and mill. In an isolated, dense tree row, mainly poplar and willow. 1 DS./1.
31. Urzędów, Dębniak, NW part. The Urzędówka river valley, wet. On the riverside, in an isolated row of several poplars. 3 DM/1, 15, 53.
32. Urzędów, Dębniak, NW part. The edge of the Urzędówka river valley. Near buildings, next to a field path. In a poplar row over a stretch of 50 m. 3 DM/1, 1, 7.
33. Urzędów, Dębniak, NW part. The Urzędówka river valley, wet. On the riverside, the edge of an isolated grove, mainly alder, with a negligible admixture of poplar and other trees. 2DM/1, 2.
34. Urzędów, Dębniak, NW part. The Urzędówka river valley, wet. On the riverside, the edge of an isolated grove, mainly alder, with a sparse admixture of poplar and other trees. 1 DM/1.
35. Urzędów, Bęczyn, extreme W part, ca. 150 m from the road. The edge of the wet Urzędówka river valley. Next to buildings, a grassy square, among an isolated, dense group of poplars. 3 DR/2, 1, 2.
36. Urzędów, Bęczyn, extreme W part. Ca. 70 m from the road, at the junction of gmina roads. Next to a building. The edge of an orchard, with scattered, sparse linden and poplar specimens. 1I/1.
37. Urzędów, Bęczyn, extreme W part. Next to the arterial road, on either side of its fork. Near buildings, orchard edges with tree clumps and scattered sparse linden and poplar specimens. Over a stretch of 70 m. 2I/4, 6.
38. Urzędów, Bęczyn, extreme W part. Several dozen m from the road, between buildings. The edge of a square, with many trees, mainly poplar, willow, and birch. 1 DM/2.
39. Urzędów, Bęczyn, extreme W part. Near the road, on either side of it, over a stretch of ca. 70 m next to buildings, edges of squares with scattered single trees and groups of trees, mainly linden and poplar, and willow. 1I/2; 1G/1; 1DM/1.
40. Urzędów, Bęczyn, extreme W part, ca. 120 m from the road, the edge of the wet Urzędówka river valley. Near buildings, a pasture, with sparse row groups of poplars. 1 DM/3.
41. Urzędów, Bęczyn, W part. A dozen or more m from the road. Near buildings, an orchard edge, with many fruit trees and 2 isolated specimens of linden. 1I/1.
42. Urzędów, Bęczyn, near the road. Next to a building, the edge of a tiny garden, with one linden specimen. 1I/3.
43. Urzędów, Bęczyn, central-western part. Ca. 160 m from the road. Next to buildings, an irregularly tree-covered square, mainly with poplar and linden. 1DM/4; 1I/6.
44. Urzędów, Bęczyn, central-western part, near the road. Near a building, an orchard edge, with sparse, scattered trees, mainly linden and poplar. 1I/36.

45. Urzędów, Bęczyn, almost central part. Ca. 150 m from the road. The edge of the wet Urzędówka river valley. Near a building, a pasture with a dense tree belt, mainly poplar and birch. 1 DM/2.
46. Bęczyn central-eastern part. Ca. 70 m from the road. Next to buildings, a square with shrub and tree clumps, mainly hazel and poplar. 1 DM/1.
47. Urzędów, Bęczyn, central-eastern part. Near the road and buildings. A square next to a chapel, among a group of lindens. 2I/1, 2.
48. Urzędów, Bęczyn, E part. On either side of the road, on the surface of a dozen-odd trees. On the N side of the road: next to the road and near it. A square between buildings, irregularly planted, mainly poplar, linden and willow. 1C/1; 2DM/1,2. On the S side of the road: the square next to a building, with scattered sparse trees, mainly linden. 1I/2.
49. Urzędów, Bęczyn, extreme E part. Next to the road, next to a small garden with buildings. In a thin row of trees, mainly rowan and maple. 1H/1.
50. Urzędów, Mikuszewskie suburb, SW part. Near the road, between buildings, next to a driveway. A square with scattered trees, mainly linden and poplar. 1I/1.
51. Urzędów, Mikuszewskie suburb. Ca. 100 m before the fork of roads. The edge of the wet Urzędówka river valley. Next to buildings, a grove mainly with alder, willow and poplar. 1DM/1.
52. Urzędów, Mikuszewskie suburb, NE part. Above the road, a scarp slope, densely shrub- and tree-covered, mainly with hazel, rowan, acacia and poplar. 2F/2,2.
53. Urzędów, Mikuszewskie suburb, NE part. Next to either side of the road, over a stretch of ca. 120 m. The edge of crop fields. Among thin and dense rows of trees, mainly maple, poplar and linden. On the W side of the road: 3B/7, 5, 3; 2DS/1, 4. On the E side of the road: 2B/2, 1; 1DS/7.
54. Urzędów, Mikuszewskie suburb, NE part. Next to either side of the road over a stretch of ca. 60 m. Edges of crop field. Among dense and broken lines of a tree row. On the W side of the road: 1B/1. On the E side of the road: 1DR/1.
55. Urzędów, Mikuszewskie suburb. NE part. Next to the road near an orchard. In a thin row of trees, mainly poplar and maple. 1B/2.
56. Wierzbina, Stara Wieś, SW part. Near the road, the scarp ridge. The edge of dense shrubs and sparse trees, mainly hazel and poplar. 1DM/4.
57. Wierzbina, Stara Wieś, SW part. Near a local road. A square between buildings, the slope of a deep ditch. Among a dense, isolated group of trees: linden and poplar 1I/1.
58. Wierzbica, SW part, the area of farmland and meadows. Ca. 250 m from the road, the bottom of local valley. In an isolated, dense row of trees, mainly poplar 1DM/1.
59. Wierzbica, near the Fire Department building. Next to the road, the edge of a square. In a dense row of poplars. 1DM/1.
60. Wierzbica, SW part. Next to the road, the edge of crop field. In an isolated group of poplars. 1 DM/1.
61. Wierzbica, SW part. Next to the fork of roads, the edge of crop field, with raspberry crop. In a thin row of trees, mainly poplar. 1DM/1.
62. Wierzbica, SW part. Next to the road, the edge of crop fields. In an isolated, dense row of trees, mainly poplar. 2DS/18, 5.
63. Wierzbica, SW part. Next to the road, edge of arable fields. In a thin row of trees, mainly poplar. 1DS/1.

64. Wierzbica, W part. Near the road, next to buildings. The edge of an orchard run wild, with clumps of linden. 1I/1.
65. Wierzbica, W part. Next to the road, the edge of crop fields. In an isolated row of poplars. 1DM/6.
66. Wierzbica, W part. Near the road, the edge of school square with buildings, irregularly tree-covered, mainly with poplar and linden. 1DM/7; 1I/4.
67. Wierzbica, extreme NW part. Opposite the grove, next to the road. The edge of crop fields. In a tree row, mainly poplar. 1DM/1.
68. Okrąglica, S part. Next to the road, the edge of crop fields. In a poplar row. 1DM/3.
69. Okrąglica, S part. Near the road. Next to buildings. The edge of orchard run wild, with scattered specimens of mainly poplar, linden and other trees. 2I/1, 2.

RESULTS OF INVESTIGATION

In the described Urzędów area, covering 59.6 km², in 2000–2007, 69 single and group stations of mistletoe subspecies (*Viscum album* L. *subsp. album* P. W. Ball) were reported. This plant occurs here far more often in single and sparse stations than in many-specimen, group stations, i.e. both with the number of host specimens and the number of mistletoe shrubs. For example, these are stations: in the former case – the most abundant ones – nos. 1–18, 32–42, 54–59, and in the latter – some few-specimen ones – nos. 19, 24, 27, 31, 43, 53, 60. In all, a total of 454 mistletoe shrubs parasitize 11 host taxa or 106 specimens (Table 1).

Table 1. The structure *Viscum album* subsp. *album* occurrence in the vicinity of the town of Urzędów (2000–2007)

Tree host taxons of <i>Viscum album</i> subsp. <i>album</i> and tree letter markings in station descriptions	Number of specimens:		
	stations	host taxon	<i>Viscum album</i> subsp. <i>album</i>
A. <i>Acer platanoides</i> L.	4	7	11
B. <i>Acer saccharinum</i> L.	3	5	21
C. <i>Malus domestica</i> Borkh	3	3	3
DM. <i>Populus xeuamericana</i> (Dode) Guiner 'Marilandica'	27	36	163
DR. <i>Populus xeuamericana</i> (Dode) Guiner 'Robusta'	3	5	7
DS. <i>Populus xeuamericana</i> (Dode) Guiner 'Serotina'	12	16	77
E. <i>Populus symonii</i> Car.	1	1	1
F. <i>Robinia pseudacacia</i> L.	2	3	5
G. <i>Salix alba</i> L.	4	4	4
H. <i>Sorbus aucuparia</i> L.	1	1	1
I. <i>Tilia cordata</i> Mill.	20	25	162
Total	11	(69)	454

No distinct correlation regularities were found, e.g. between mistletoe stations and its hosts and their habitat conditions. A similar ecological situation of mistletoe, like the one described above, is found in central-eastern Poland and in other regions (15, 17, 18, 19 and literature quoted therein).

All the local mistletoe hosts belong to trees that grow as a result of plantings. Among these, kenophytes (7 species) clearly outnumber apophytes (4 species). The main mistletoe hosts include: *Populus xeuramericana* in its varieties of 'Marilandica' and 'Serotina' and *Tilia cordata*. Also worth noting is the absence of mistletoe stations on trees with natural stations, and a sporadic presence of mistletoe on fruit trees. It should be stressed that the hosts are mainly healthy trees aged 40–60 years. They were usually reported in open sites with sufficiently high insolation. There are absolutely no mistletoe stations for example in dense, shady parks or forests. In groves and forests it usually occurs on their sun-lit fringes or only on the highest host tree specimens.

Mistletoe stations were not reported e.g. on its potential hosts growing in different numbers in open, vast cropland. In such regions, even next to the roads, this plant seldom occurs despite an abundant number of its potential hosts. Quite interesting is also a comparatively sparse group of mistletoe stations in the valleys of the river network, wooded to a different degrees, with scattered tree groups.

Mistletoe stations were reported in different types of habitats, from natural soils to extremely anthropogenic. They occur least frequently on wet and dry soils such as humus alluvial soils, rendzinas, and brown soils. They are, however, found most frequently on anthropogenic soils (mesophilic, sandy-clayey-gravelly soils), situated next to the roads, on the edges of squares, between buildings etc.

Essentially, the most numerous mistletoe stations are grouped in the neighborhood or next to very busy roads, in the most densely built-up sites with scattered trees. This takes place within the town boundaries of mainly Urzędów, and, to a smaller extent, in some distant villages like Leszczyny and Wierzbica.

During the five-year period of studies on mistletoe occurrence in the area of Urzędów, the intense dynamics of its stations was reported. This phenomenon can be observed equally frequently in the stations where the mistletoe settled earlier and outside them, at different distances from them, in new stations. The first case of dynamics of mistletoe specimens took place e.g. in stations nos. 19, 24, 27, 29–35, 40, 48, 53, 60–69. It first appeared in stations nos.: 9, 11, 12, 14, 17, 20–23, 25, 28, 37, 42–47, 51, 52, 54–58.

The investigated mistletoe is a plant of the warmer zones of temperate climate. Hence the expansion of this plant can be associated above all with the phenomenon of progressive warming of the climate that has been observed in Poland over the last dozen-odd years. It is possible that mild winters favor the intensified expansion of mistletoe when it flowers, fruits, and scatters its seeds in different ways. The cause of mistletoe's expansion may also stem from the progressive weakening of the viability of its hosts as they grow old and occur in the increasingly polluted environment, especially in the roadside and densely built-up areas.

On the other hand, it should be stressed that the number of discovered mistletoe stations gradually decreases. This takes place first of all next to the roads and in the successively highly built-up sites. This tendency is primarily the result of cutting the main and most common mistletoe hosts. Examples of where the discovered mistletoe stands have already been entirely destroyed because its hosts were cut are characterized in nos. 7, 8, 36, 38, 41, 49, 50, 59. Destruction of the settled mistletoe specimens is also related to harvesting them for decorative and curative purposes. In practice, the mistletoe, as a result of progressive destruction of its hosts and the harvesting of it, is becoming an increasingly rare plant in Poland's plant landscape, soon to be an endangered species.

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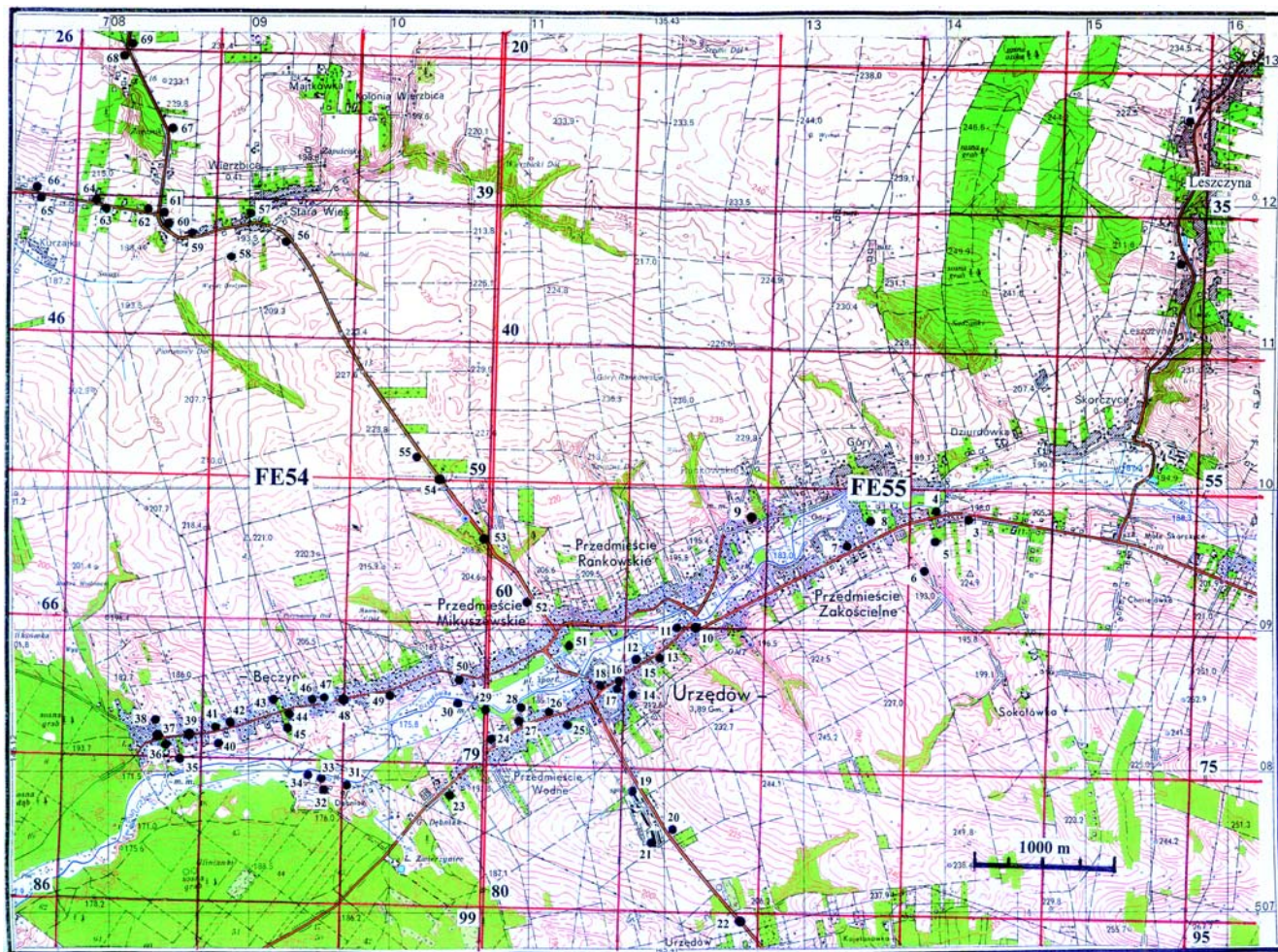


Fig. 1. Map of 69 mistletoe (*Viscum album* subsp. *album*) stations in the area of the town of Urzędów. NB: the area of studies of mistletoe was located against the ATPOL grid squares with sides 1x1 km (25)



Fig. 2. Mistletoe (*Viscum album* subsp. *album*) in the crowns of poplar (*Populus xeuamericana* 'Serotina') Urzędów, stand no. 26. Photo by F. Świąs, April 2007

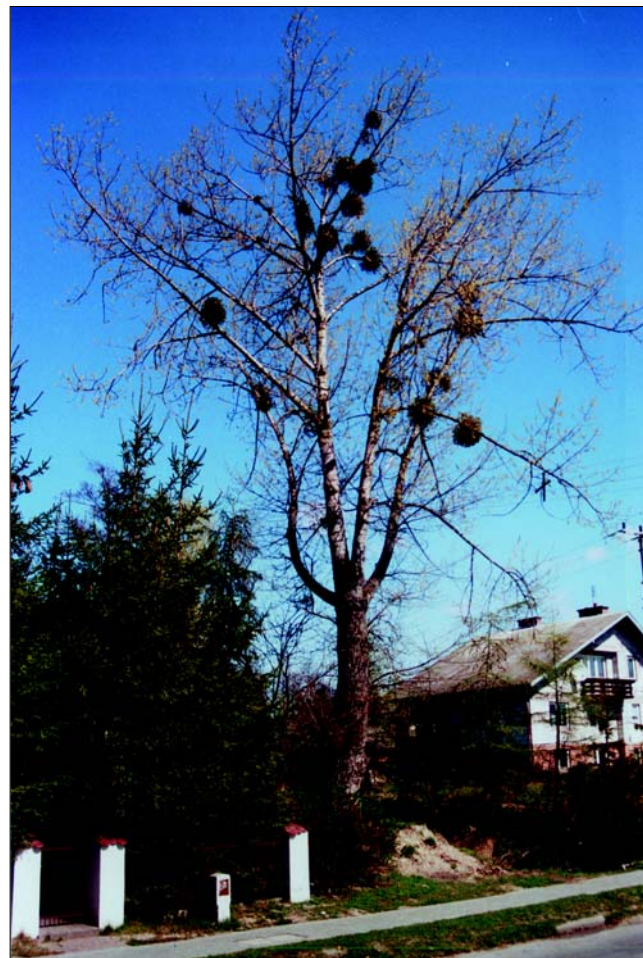


Fig. 3. Mistletoe (*Viscum album* subsp. *album*) in the crowns of poplar (*Populus xeuamericana* 'Serotina') Urzędów, stand no. 24. Photo by F. Świąs, April 2007



Fig. 4. Mistletoe (*Viscum album* subsp. *album*) in the crowns of linden (*Tilia cordata*) Urzędów, stand no. 27. Photo by F. Świąś, April 2007



Fig. 5. Mistletoe (*Viscum album* subsp. *album*) in the crowns of poplar (*Populus xeuamericana* 'Serotina') Urzędów, stand no. 31. Photo by F. Świąś, April 2007



Fig. 6. Mistletoe (*Viscum album* subsp. *album*) in the crowns of linden (*Tilia cordata*) Urzędów, Bęczyn, stand no. 47. Photo by F. Świąs, April 2007



Fig. 7. Mistletoe (*Viscum album* subsp. *album*) in the crowns of apple tree (*Malus domestica*) Urzędów, Bęczyn, stand no. 48. Photo by F. Świąs, April 2007