Biosystematic studies on *Dactylis* L. 2. Personal research. 2.1. Morphological differentiation and occurrence of representatives of the genus *Dactylis* in Poland. 2.1.3. Distribution of *D. glomerata* subsp. *aschersoniana* (Graebn.) Thell. in Poland

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Abstract

In this paper the author presents the distribution of *D. g.* subsp. *aschersoniana* (Graebn.) Thell. in 198 localities in Poland. The studies on distribution were based mainly on revision and verification of materials from Polish herbaria. It is stated that subsp. *aschersoniana* occurs in deciduous forests in lowlands and on plateaus as well as in lower mountain altitudes. Part of the localities are situated beyond the present eastern limit of the *Fagus sylvatica* distribution. This confirms the opinion that this subspecies is not connected with beech woods but rather with oak-hornbeam forests. Sometimes subsp. *glomerata*, subsp. *slovenica* and subsp. *aschersoniana* were found in one locality. This fact is very important in the context of gene-flow between these three subspecies.

Key words: *Dactylis glomerata* subsp. *aschersoniana* (Graebn.) Thell., distribution, Poland

INTRODUCTION

D. glomerata subsp. *aschersoniana* is one of three subspecies of *D. glomerata* which occur in Poland (Mizianty 1988).

This taxon was first described under the name *Dactylis polygama* by Horvátovsky (1774) from Male Karpaty, in the vicinity of Trnava (Czechoslovakia). Later the same taxon was described by Graebner (1899) from the

neighbourhood of Nauen (Brandenburg, GDR) under the name *Dactylis aschersoniana*. Thellung (1911) reduced *D. aschersoniana* to the rank of subspecies of *D. glomerata*.

According to the current International Code of Botanical Nomenclature (1983) this taxon has two correct epithets (according to the rank in which it occurs). When the taxon is determined as a species the correct name is *D. polygama* Horvat., whereas in the case of the subspecies it is *D. glomerata* subsp. *aschersoniana* (Graebn.) Thell.

Subsp. *aschersoniana* is the only diploid representative of the genus *Dactylis* in Poland, while subsp. *glomerata* and subsp. *slovenica* are tetraploids.

The area of distribution of subsp. *aschersoniana* is the largest of all the diploids in the genus *Dactylis* (Flora Europaea 1980). It occurs in Western and Central Europe, Southern Scandinavia, the western part of European USSR and in the Caucasus (Prokudin et al. 1977). In the opinion of some research workers (Stebbins 1956, Sinskaya 1964) *D. himalayensis* Dom., occurring in the West Himalayas and South-Eastern China is very closely connected with subsp. *aschersoniana* and should not be included in the taxon "*glomerata*" but rather in "*aschersoniana*". Accepting this point of view, it may be said that subsp. *aschersoniana* has a disjunct pattern of distribution. This kind of distribution is evidence that subsp. *aschersoniana* is an old taxon. It is treated as a relic of the Tertiary period, in which a continuous zone of forest stretched across Europe and Asia.

Typical habitats of this subspecies are deciduous forests in lowlands and in lower mountain altitudes. Hegi (1965) gives deciduous forests, especially beach forests, as the main habitat of subsp. *aschersoniana*. Szafer et al. (1967) reported it from shady forests and thickets. Medwecka-Kornaś (1977) described subsp. *aschersoniana* as a characteristic species for two forms of geographical oak-hornbeam forests (*Galio-Carpinetum* Oberd. as well as *Tilio-Carpinetum* Traczyk).

Several factors have played an important role in the evolution of the genus *Dactylis*. Opinions vary as to the exact role of these factors. Grigoryev (1962) stated that changes in habitat conditions are the main reason that new taxa appear. However, he underestimated the role of polyploidy. In the opinion of Sinskaya (1964) polyploidy as well as introgressive hybridization played an important role in the evolution of this genus.

Thus it seems that a detailed study of the distribution of subsp. *aschersoniana* in Poland accompanied by simultaneous observation of habitats and plant communities in which it occurs is necessary.

The main aim of the present paper is to study the distribution of *D. g.* subsp. *aschersoniana* on the basis of revision and verification of herbarium materials.

Subsequent papers of this series will concern cytological problems.

MATERIAL

The studies on the distribution of *D. g.* subsp. *aschersoniana* were based on materials from the following Polish herbaria: KRA, KRAM, KTU, LBL, LOD, POZ, WA, WRSL, TRN, WSRP, BIL^x, KTCB^x, OLSM^x, SLTC^x, SZCZ^x, UGDA^x, hb Mąd.^x.

Investigations on the above mentioned herbaria were complemented by revision of herbaria from: the USSR (LWD, LW, KW, KWA), Czechoslovakia (PR, PRC, SAV, SLO) and GDR (DR, HAL, JE, LZ).

The author's own collections (MM) were also added to these.

The abbreviations of the names of the herbaria (except of MM) are given according to the Index Herbariorum (1981) and Mirek (1989). The later are marked by "x".

Revision of herbarium materials was carried out after earlier determination of characteristic morphological features for subsp. *aschersoniana* and after testing them in experimental cultures (Mizianty 1988).

RESULTS

The occurrence of diploid *D. g.* subsp. *aschersoniana* has been established in 198 localities in Poland, and in addition in 7 localities in the USSR (beyond the eastern limit of the *Fagus sylvatica* distribution).

This subspecies occurs all over Poland (Fig. 1 and List of localities). According to the geobotanical division of Poland (Szafer 1977a), *D. g.* subsp. *aschersoniana* occurs in the following divisions: Baltic Division (from the Belt of the Maritime Plains and Pomeranian Uplands to the Belt of the Central Highlands), Northern Division (from Section Mazursko-Kurpiowska to Section Białowiesko-Knyszyńska), Steppe-Forest Division (Section Western Wolhynia), West Carpathian Division (Tatra, Pieniny, Beskidy), East Carpathian Division (Bieszczady, Przemyśl Plateau), and Sudeten Division (West Sudeten, East Sudeten). In general, subsp. *aschersoniana* occurs in deciduous forests in lowlands and on plateaus as well as in lower mountain altitudes. Part of the stands are situated in the central and eastern areas of Poland, that is beyond the present eastern limit of the *Fagus sylvatica* distribution (Fig. 1). Therefore, this confirms the opinion that this subspecies is not connected with beech woods but rather with oak-hornbeam forests. Revision of several USSR herbaria also confirms the previous suggestion that subsp. *aschersoniana* grows beyond the eastern limit of the *Fagus sylvatica* distribution.

Results of the present paper agree with studies of Rurka (1974), who localized diploid subsp. *aschersoniana* on 42 localities in Poland; half of them

Fig. 1. Distribution of *Dactylis glomerata* subsp. *aschersoniana* (Graebn.) Thell. in Poland. 1 — stands of *D. g. subsp. aschersoniana*. 2 — eastern limit of *Fagus sylvatica* according to: Atlas rozmieszczenia drzew i krzewów w Polsce 1976, Szafer 1977b

were also found beyond the present eastern limit of the *Fagus sylvatica* distribution.

This paper also lists (on the basis of herbarium notes) types of habitats in which *D. g. subsp. aschersoniana* occurs (Table 1).

Subsp. *aschersoniana* and subsp. *glomerata* may exist sympatrically over the whole area of Poland except the higher mountain regions. In some mountainous parts of the country, subsp. *glomerata*, subsp. *aschersoniana* and subsp. *slovenica* may occur together. Numerous contacts between diploid populations

Table 1

Plant communities with *Dactylis glomerata* subsp. *aschersoniana* (Graebn.) Thell. — cited from herbarium labels (numbers show the stands)

Oak-hornbeam forest	Carr	The remainder	
		forest	others
<p>Oak-hornbeam forest: 8, 26, 40, 56, 68, 70, 73, 87, 89, 90, 91, 141, 159, 165, 172</p> <p><i>Galio-Carpinetum</i>: 67</p> <p><i>Tilio-Carpinetum</i>: 145, 161</p> <p>Wet: 57, 83</p> <p>Wet, acid: 58, 62</p> <p>Wet, rich: 59, 60</p> <p>Light: 154, 155</p> <p>With <i>Carex pilosa</i>: 61</p> <p>With <i>Carex remota</i>: 63</p> <p>With <i>Calamagrostis</i>: 51</p> <p>With conifers: 31</p> <p>Pastured: 49</p> <p>Oak-hornbeam thickets: 143</p>	<p>carr: 50, 170</p> <p>alder: 45, 77, 101, 175</p> <p>ash-elm: 16</p> <p>carr thickets: 92</p>	<p>forest: 1, 5, 35, 38, 88, 124, 128, 146, 158, 164, 169, 171, 198</p> <p>pine: 29, 105</p> <p>fir: 184</p> <p>spruce cultivation: 43</p> <p>mixed: 2, 10, 12, 19, 36, 37, 41, 48, 66, 72, 75, 111, 112, 121, 127, 130, 144, 178, 179</p> <p>pine-oak: 110, 117</p> <p>deciduous: 11, 14, 24, 27, 33, 65, 99, 132, 134, 135, 138, 142, 191</p> <p>beech: 3, 17, 23, 71, 147, 150, 151, 177, 182, 193</p> <p>oak: 153</p> <p>beech-oak: 4</p> <p>beech-hornbeam-birch: 195</p> <p>hornbeam-beech: 188</p> <p>oak-aspen-birch: 74</p>	<p>clearing in a forest: 120</p> <p>clearing in a mixed forest: 32</p> <p>clearings in fir forest: 185</p> <p>forest way: 30</p> <p>roadside: 76</p> <p>roadside in a pine forest: 105</p> <p>border of forest: 104, 176, 190, 197</p> <p>old, neglected clearing: 53</p> <p>clearing: 174</p> <p>meadow: 46, 47, 100, 119</p> <p>field: 93</p> <p>dirt-track: 42</p> <p>grass: 25</p> <p>thickets: 13, 34, 80, 122, 125, 136, 139, 173, 189</p> <p><i>Potentillo albae-Quercetum</i>: 9</p> <p>loessic ravine: 108, 109, 113, 148</p> <p>loessic slope: 106, 107, 152</p> <p>park: 6, 7, 20, 86, 102, 103, 114, 115, 126, 129, 131, 133, 149</p> <p>ditch: 96</p> <p>at the stream: 44, 194</p> <p>border of peatbog: 116</p> <p>cemetery: 118</p>

(subsp. *aschersoniana*) and tetraploids (subsp. *glomerata* and subsp. *slovenica*) are very important from the evolutionary point of view, because sterility barriers between these cytotypes are not complete (Müntzing 1937, Doroszewska 1961). On the basis of earlier studies (Mizianty 1988) it was stated that intermediate morphological forms between these three subspecies occur in Poland.

Diploids are treated as a natural group of the genus *Dactylis*. There is still, however, insufficient data as to the origin of tetraploids. In different theories of subsp. *glomerata* phylogeny, subsp. *aschersoniana* is always taken into consideration, either the present subsp. *aschersoniana* or its ancestors. The localization of stands of subsp. *aschersoniana* confirms the possibility of contacts between this subspecies and subsp. *glomerata* and subsp. *slovenica*. On the basis of morphological characters of subsp. *slovenica* it may be supposed that probably one of its ancestors is subsp. *aschersoniana*. It is very probable that in the origin of subsp. *slovenica* some role is played by subsp. *glomerata*, as it is very common all over Poland, in mountain areas as well.

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Biosystematyczne studia Dactylis L. 2. Badania własne. 2.1. Zróżnicowanie morfologiczne i występowanie przedstawicieli rodzaju Dactylis w Polsce. 2.1.3. Rozmieszczenie D. glomerata subsp. aschersoniana (Graebn.) Thell. w Polsce

Streszczenie

W niniejszej pracy podano rozmieszczenie *D. g.* subsp. *aschersoniana* (Graebn.) Thell. na 198 stanowiskach w Polsce (rys. 1). Badania nad rozmieszczeniem tego taksonu przeprowadzono głównie na podstawie rewizji materiałów zielnikowych z Polski. Stwierdzono, że podgatunek ten występuje w lasach liściastych na terenie całej Polski (na nizinach i pogórzu, jak też w niższych położeniach górskich). Część stanowisk jest usytuowana poza współczesną, wschodnią granicą zasięgu *Fagus sylvatica*. Potwierdza to opinię, że *D. g.* subsp. *aschersoniana* nie jest związana z buczyną, a raczej z lasami typu grądowego. Analiza materiałów zagranicznych, w których znaleziono subsp. *aschersoniana* na terenach ZSRR (patrz Lista stanowisk), leżących poza wschodnią granicą zasięgu *Fagus sylvatica*, jest potwierdzeniem powyższego wniosku.

Cała Polska z wyjątkiem wyższych położeń górskich, jest obszarem, gdzie mogą występować sympatrycznie subsp. *aschersoniana* i subsp. *glomerata*. Pewne górskie obszary kraju mogą być terenem występowania trzech podgatunków (subsp. *glomerata*, subsp. *aschersoniana* i subsp. *slovenica*) równocześnie. Odnotowanie tego faktu, ma duże znaczenie w związku z możliwością wymiany genów między tymi podgatunkami.

LIST OF LOCALITIES OF *DACTYLIS GLOMERATA* SUBSP. *ASCHERSONIANA* (GRAEBN.) THELL.

Explanations: Poland (1-198)

USSR (7 localities not numbered and not marked on the map)

1. Międzyzdroje, Province of Szczecin, forest, ..., 08.1952, M. Merkel, LOD
2. Trzciągowo on Wolin Island, Province of Szczecin, mixed forest above a chalk-pit, 28.08.1963, H. Piotrowska, UGDA^x
3. "Źródłiskowa Buczyna" Reservation, Province of Szczecin, Bukowa Forest, section 22, 27.06.1962, F. Celiński POZ
4. Krzynka-Okunie near Barlinek, Province of Gorzów Wielkopolski, beech-oak forest, 09.07.1960, ..., SZCZ^x

5. Gorzów Wielkopolski, Province of Gorzów Wielkopolski, damp part of "Czechówek" Forest, 16.07.1967, J. Misiewicz, SLTC^x
6. Tychowo near Białogard, Province of Koszalin, park, 20.07.1977, U. Peszko, SLTC^x
7. Trzcinno near Miastko, Province of Słupsk, thickets at the park pond, 20.06.1979, J. Bartczak and Siciński, LOD
8. Osiek near Wyrzysk, Province of Piła, in hornbeam forest, 07.06.1931, J. Paczosi, KRAM, POZ
9. Chociński Młyn, Province of Bydgoszcz, Tucholskie Forests, *Potentillo-albae Quercetum*, 15.07.1976, E. Żukowska, TRN
10. Wierzchlas, Province of Bydgoszcz, Tucholskie Forests, mixed forest, 25.07.1977, W. Gugnacka-Fiedor, KRAM, POZ, WA, LBL, LOD
11. Różanna, Province of Bydgoszcz, deciduous forest, 11.07.1959, M. Ceynowa, TRN
12. Dębowiec at Wisła River near Koźmierz, Province of Bydgoszcz, mixed forest, 20.06.1938, F. Krawiec, POZ
13. Płutowo, Province of Toruń, thickets, 21.08.1958, M. Ceynowa, TRN
14. Płutowo, Province of Toruń, ravine in deciduous forest, 18.06.1952, Małek, TRN
15. Płutowo, Province of Toruń, in ravine descending towards the Wisła valley, 29.06.1957, J. Mądalski, hb. Mąd.^x
16. Gródeczek near Świecie, Province of Bydgoszcz, ash-elm carr, 28.08.1971, E. Sworowski, TRN
17. "Buczyna" Cliff Reservation, Province of Gdańsk, Rozewie Peninsula, 24.06.1983, M. Jagiełło, MM
18. Between Czapielsk and Kolbudy, Province of Gdańsk, lake district of Kartuszy, gorge of Reknica River, 23.08.1972, W. Żukowski, POZ
19. Vicinity of Sartowice, Province of Bydgoszcz, mixed forest, 25.06.1952, K. Kołodziejczyk, TRN
20. Hel, Province of Gdańsk, park thickets, 14.08.1974, J. Misiewicz, SLTC^x
21. Wilczy Młyn near Lubicz, Province of Toruń, ravine at Drwęca River, 14.06.1952, K. Kurbloch, TRN
22. "Mielwo" Forest Reservation, Province of Toruń, lake district of Brodnica, 20.09.1975, Z. Rurka, WA
23. "Bażantarnia Forest", Province of Elbląg, east of Elbląg, beech wood, 10.06.1986, L. Frey, MM
24. Iława, Province of Olsztyn, deciduous forest, ...07.1970, M. Chojńska, TRN
25. Lubawa, Province of Olsztyn, grass, 10.07.1976, J. Modzelewska, LOD
26. Szyldak, Province of Olsztyn, oak-hornbeam forest at Durąg River, 16.09.1977, A. Sendek, KTU
27. Tabórz near Łukta, Province of Olsztyn, deciduous forest, Reservation, 28.06.1975, E. Otremba, LOD
28. Pieniężno near Braniewo, Province of Elbląg, valley of Walsza River, Reservation, 16.06.1964, J. Mądalski, hb. Mąd.^x
29. Olsztyn, Province of Olsztyn, pine forest in a habitat of *Quercus-Carpinetum* in the western part of the city, 14.06.1952, A. Jasiewicz, KRAM
30. Vicinity of Kortowo, Province of Olsztyn, turfy, forest path 17.08.1958, B. Polakowski, OLS^x
31. Ramuki Forest Inspectorate, Province of Olsztyn, oak-hornbeam forest with conifers, 14.10.1969, A. Sokołowski, BIL^x
32. Łaniewo near Lidzbark Warmiński, Province of Olsztyn, clearing in a mixed forest, 25.07.1979, M. Dzwonczak, LOD
33. Vicinity of Ukta, Province of Suwałki, deciduous forest, 07.07.1981, J. Kruszelnicki, KRAM
34. Vicinity of Ukta, Province of Suwałki, thickets at Młyńskie Lake, 07.06. 1981, J. Kruszelnicki, KRAM

35. Ukta, Province of Suwałki, forest near the forester's lodge, 09.07.1981, J. Kruszelnicki, KRAM
36. Mały Płock Forest Inspectorate, Province of Łomża, fresh, mixed forest, 23.07.1968, A. Sokołowski, BIL^x
37. Gielczyn near Łomża, Province of Łomża, mixed forest, 29.07.1970, A. Szpakowicz and A. Sokołowski, BIL^x
38. Kierzki near Gołdap, Province of Suwałki, forest, section B-270, 20.07.1970, J. Żurawski and A. Sokołowski, BIL^x
39. Czerwony Bór Forest Inspectorate, Province of Suwałki, Borecka Forest, section 240, 11.05.1967, A. Sokołowski, BIL^x
40. Czerwony Bór Forest Inspectorate, Province of Suwałki, Borecka Forest, section 254, fresh oak-hornbeam forest, 13.06.1967, A. Sokołowski, BIL^x
41. Czerwony Bór Forest Inspectorate, Province of Suwałki, Borecka Forest, mixed wood, 21.07.1967, A. Sokołowski, BIL^x
42. Wężewo near Olecko, Province of Suwałki, along a dirt path 17.07. 1970, St. Borowiak and A. Sokołowski, BIL^x
43. Kumiecie near Gołdap, Province of Suwałki, spruce cultivation, 09.07.1970, N. Romańczuk and A. Sokołowski, BIL^x
44. Zusno near Suwałki, Province of Suwałki, section 13-388, at a stream, 16.07.1969, A. Sokołowski, BIL^x
45. Smolniki near Suwałki, Province of Suwałki, deciduous forest (alder carr), 04.08.1973, T. Załuski, LOD
46. Świeć Wielki, Province of Łomża, section K-252, at a meadow, 04.06.1970, A. Kawecka and A. Sokołowski, BIL^x
47. Hryniewicze near Bielsk Podlaski, Province of Białystok, meadow, section L-477, 09.07.1973, J. Wołkowych and A. Sokołowski, BIL^x
48. Nurzec Forest Inspectorate, Province of Białystok, Białowieża Forest, section C-114, mixed forest, 16.09.1967, A. Sokołowski, BIL^x
49. Zbucz near Hajnówka, Province of Białystok, pastured oak-hornbeam forest, 15.07.1968, A. Sokołowski, BIL^x
50. Zwierzyniec Forest Inspectorate, Province of Białystok, Białowieża Forest, section 426, carr, 14.06.1963, A. Sokołowski, BIL^x
51. Hajnówka Forest Inspectorate, Province of Białystok, Białowieża Forest, oak-hornbeam forest with *Calamagrostis*, 23.06.1967, A. Sokołowski, BIL^x
52. Białowieża, Province of Białystok, 31.08.1958, B. Brzyski, KRAM
53. Białowieża National Park, Province of Białystok, old neglected clearing, 30.06.1936, K. Piech, KRAM
54. Białowieża National Park, Province of Białystok, sections 314, 315, 340, 24.06.1966, A. Sokołowski, BIL^x
55. Białowieża National Park, Province of Białystok, section 341, 12.07.1966, A. Sokołowski, BIL^x
56. Białowieża National Park, Province of Białystok, section 344 kl-620, oak-hornbeam forest, 26.08.1965, A. Sokołowski, BIL^x
57. Białowieża National Park, Province of Białystok, section 399, wet oak-hornbeam forest, 19.08.1969, A. Rusińska and A. Sokołowski, BIL^x
58. Białowieża National Park, Province of Białystok, section 400, wet, acid oak-hornbeam forest, 07.07.1966, A. Sokołowski, BIL^x
59. Białowieża National Park, Province of Białystok, section 284, wet, rich oak-hornbeam forest with hazel, 30.08.1966, A. Sokołowski, BIL^x
60. Białowieża National Park, Province of Białystok, sections 255 and 257, rich oak-hornbeam

- forest, 07.09.1966, A. Sokołowski, BIL^a
61. Białowieża Forest, Province of Białystok, oak-hornbeam forest with *Carex pilosa*, 24.06.1925, J. Paczoski, POZ
 62. Białowieża Forest, Province of Białystok, 1925, R. Kobendza, WA
 63. Białowieża Forest, Province of Białystok, section 418-c, oak-hornbeam forest with *Carex remota*, 23.06.1967, A. Sokołowski, BIL^a
 64. Białowieża Forest, Province of Białystok, sections 419-Dc, and 419-Da, 16-24.06.1967, A. Sokołowski, BIL^a
 65. Sieraków, Province of Poznań, deciduous forest at Lutomskie Lake, 23.07.1975, K. Latowski and W. Żukowski, POZ
 66. Bytyń, Province of Poznań, mixed forest with dominance of oaks, S of town, 28.06.1931, F. Krawiec, KRAM
 67. Bieczyny Forest District, Province of Poznań, Konstantynowo Forest Inspectorate, *Gallio-Carpinetum*, 12.06.1974, E. Fogel, POZ
 68. "Dębina" Reservation, Province of Poznań, near Wiatrowiec, oak-hornbeam forest, 01.08.1977, M. Mizianty, MM
 69. Parkowo near Rogoźno, Province of Piła, 20.06.1926, ..., POZ
 70. Kąty Forest Inspectorate, Province of Poznań, Zielonka Forest, oak-hornbeam forest, 14.09.1967, A. Pacyna and D. Tumidajowicz, KRA
 71. Kórnik, Province of Poznań, beach forest, 09.09.1928, J. Paczoski, POZ
 72. Promno near Poznań, Province of Poznań, mixed forest, 10.06.1936, F. Krawiec, POZ
 73. Iwno and Kociałkowa Górka vicinity, Province of Poznań, S of Pobiedziska, oak-hornbeam forest, 27.06.1935, L. Bujkówna, POZ
 74. Bogusławki near Gostyń, Province of Leszno, oak-aspen-birch forest with *D. glomerata* subsp. *glomerata*, *Poa trivialis*, *Poa pratensis*, *Festuca heterophylla*, 27.06.1939, C. Kaczmarek, POZ
 - * 75. Potarzyca near Koźmin, Province of Kalisz, mixed forest, 26.05.1934, F. Krawiec, POZ
 76. Smoszew near Krotoszyn, Province of Kalisz, roadside, 20.07.1965, Kotewicz, WRSL
 77. Murzynówko near Środa, Province of Poznań, alder carr, section 113, 24.07.1961, C. Kaczyńska, POZ
 78. Słomowo vicinity, Province of Poznań, 26.09.1977, K. Latowski and B. Jackowiak, POZ
 79. Pińsko near Szubin, Province of Bydgoszcz, 09.06.1967, M. Ceynowa-Gieldon and E. Werling, TRN
 80. Małków, Province of Sieradz, ravine thickets, 15.06.1967, R. Olaczek, LOD
 81. "Ostrowy" Reservation, near Nowe Ostrowy, Province of Płock, 11.07.1977, H. Rutowicz and R. Olaczek, LOD
 82. "Ostrowy" Reservation, near Nowe Ostrowy, Province of Płock, 23.06.1976, H. Rutowicz and R. Olaczek, LOD
 83. Daszyna near Łeczyca, Province of Płock, park, low oak-hornbeam forest, 24.07.1969, R. Olaczek, LOD
 84. "Mnich" Range near Kutno, Province of Płock, 04.06.1969, ..., and P. Witosławski, LOD
 85. "Mnich" Range near Kutno, Province of Płock, 21.06.1976, H. Rutowicz and E. Łukasiewicz, LOD
 86. Lućmierz near Zgierz, Province of Łódź, park, 26.06.1969, R. Olaczek, LOD
 87. "Molenda" Reservation, Province of Łódź, section 35a and f, oak-hornbeam forest, 02.07.1968, M. Lewandowska, LOD
 88. "Molenda" Reservation, Province of Łódź, Rydzyny Forest Inspectorate, forest, 17.07.1963, E. Skalmierska, A. Gierałkowska and L. Fagaszewicz, LOD
 89. "Wiączyń" Range, Province of Łódź, Brzeziny, Forest Inspectorate oak-hornbeam forest, 09.07.1978, M. Grudzińska and E. Chalczasz, LOD

90. Bielawy-Mroga, Province of Skierniewice, oak-hornbeam forest, 26.06.1974, A. Sendek, KTU
91. Emilianów near Brzozów, Province of Skierniewice, oak-hornbeam forest, 26.06.1974, K. Rostański, KTU
92. Ziemiany near Bolimów, Province of Skierniewice, carr thickets, by a path on the slope, 10.06.1983, B. Pyczal and J. Jakubowska-Gabara, LOD
93. Spała, Province of Piotrków, field, ...06.1960, H. Drożdż, LOD
94. Podkowa Leśna, Province of Warsaw, 25.06.1932, T. Wiśniewski, KRAM, WA
95. Młochowskie Forests near Podkowa Leśna, Province of Warsaw, ...06.1932, R. Kobendza, WA
96. Mszczonów, Province of Skierniewice, ditch, 28.06.1978, A. Fortuniak, LOD
97. Chojnów, Province of Warsaw, ...06.1930, R. Kobendza, WA
98. Chojnowskie Forests, Province of Warsaw, ...06.1932, R. Kobendza, WA
99. "Dębina" Reservation near Klembów, Province of Ostrołęka, deciduous forest, 02.08.1962, B. Chruszczewska, LOD
100. Kiczki near Mińsk Mazowiecki, Province of Siedlce, meadow, 22.06.1955, L. Komorek, LOD
101. Leśna Podlaska near Biała Podlaska, Province of Biała Podlaska, alder carr, 13.09.1962, D. Fijałkowski, LBL
102. Puławy, Province of Lublin, natural park at the Agriculture Institute, 04.07.1931, F. Krawiec, POZ
103. Puławy, Province of Lublin, park, 22.06.1920, H. Jurankówna, LBL
104. Puławy, Province of Lublin, thickets at the border of Ruda Forest, 20.06.1960, T. Kuszewski, LBL
105. Markuszów, Province of Lublin, roadside in a pine forest, 16.06.1974, Z. Buczkowska, LBL
106. Zagrody near Lublin, Province of Lublin, loessic slope, 02.08.1950, D. Fijałkowski, LBL
107. Dys near Lublin, Province of Lublin, dry slope, 15.06.1978, M. Pawlus, KRAM
108. Dys near Lublin, Province of Lublin, thickets in a loessic ravine, 12.08.1948, D. Fijałkowski, LBL
109. Dys near Lublin, Province of Lublin, wooded ravine near a bus-stop, 16.06.1978, L. Frey, MM
110. Borki near Radzyń Podlaski, Province of Lublin, pine-oak forest, 14.09.1965, D. Fijałkowski, LBL
111. Ludwinów vicinity, Province of Biała Podlaska, S of Czemiernik, mixed forest, 10.07.1931, F. Krawiec, POZ
112. Wólka Krasienińska near Lubartów, Province of Lublin, mixed forest, 16.06.1969, A. Łuczycka, LBL
113. Ciecierzyn near Lublin, Province of Lublin, loessic, ravine thickets, 10.08.1948, D. Fijałkowski, LBL
114. Turka, Province of Lublin, park thicket, ...07.1922, H. Koperska, LBL
115. Turka, Province of Lublin, hills in the park, ...07.1922, H. Koperska, LBL
116. Olszowo near Wytyczno, Province of Chełm, border of peatbog (raised bog), 02.08.1960, D. Fijałkowski, LBL
117. Zahajki near Międzyrzec, Province of Chełm, pine-oak forest, 08.09.1965, D. Fijałkowski, LBL
118. Chełm Lubelski, Province of Chełm, cemetery, ...06.1926, H. Koperska, LBL
119. Tylice near Zgorzelec, Province of Jelenia Góra, meadow, 29.07.1965, St. Wulczyński, LOD
120. Szprotawa, Province of Zielona Góra, clearing in a forest, 18.08.1979, W. Solecka, LOD
121. Wojcieszów Górny, Province of Jelenia Góra, mixed forest, 06.07.1960, W. Stojanowska, WRSL
122. Głogów, Province of Legnica, thickets in a communal park, ..., Marciniak, WRSL

123. Stare Bogaczowice, Province of Wałbrzych, ..., ..., 1966, Telep-Mirowicz, WRSL
124. Szczawno-Zdrój, Province of Wałbrzych, forest, 20.07.1970, W. Włoch, WRSL
125. Bystrzyca Górna, Province of Wałbrzych, thickets on the right bank of the Bystrzyca River, 31.07.1955, J. Mądalski, hb. Mąd.^x
126. Świdnica, Province of Wałbrzych, park, 18.08.1977, D. Jarosz, WRSL
127. Szczepanów near Środa Śląska, Province of Wrocław, oak, mixed forest, by the lakelet, 09.07.1951, J. Mądalski, hb. Mąd.^x
128. Budziszów near Kąty Wrocławskie, Province of Wrocław, forest, 05.06.1977, D. Łubkowska, WRSL
129. Brzeg Dolny, Province of Wrocław, in great numbers in a natural, municipal park, 23.06.1961, Z. Głowacki, WRSL
130. Leśnica near Wrocław, Province of Wrocław, mixed forest, 05.06.1954, S. Głowin, KRA, LOD, hb. Mąd.^x, JE
131. Wrocław-Leśnica, Province of Wrocław, Zamkowy park, 06.07.1982, M. Mizianty, MM
132. Wrocław-Zacisze, Province of Wrocław, on the right bank of the Old Odra River, deciduous wood, 05.07.1982, M. Mizianty, MM
133. Wrocław, Province of Wrocław, park by Młodej Gwardii Street, 05.07.1982, M. Mizianty, MM
134. Wojnow near Wrocław, Province of Wrocław, deciduous forest, 02.06.1972, W. Berdowski, BIL^x
135. Rędzin, Province of Wrocław, deciduous forest, 18.07.1964, H. Radomska, WRSL
136. Szczodre, Province of Wrocław, thickets, 14.07.1978, M. Dudziak, WRSL
137. Jelcz near Laskowice Oławskie, Province of Wrocław, 26.08.1978, G. Janiszewska, WRSL
138. Muszkowice near Ząbkowice Śląskie, Province of Wałbrzych, deciduous forest, 07.07.1982, M. Mizianty, MM
139. Henryków, Province of Wałbrzych, shady thickets, 13.07.1978, H. Fuglewicz, WRSL
140. Przylesie near Brzeg, Province of Opole, 06.07.1963, J. Mądalski, hb. Mąd.^x
141. "Szustry" Range, Province of Kalisz, Sokolniki Forest Inspectorate, oak-hornbeam forest, 03.07.1976, B. Osiwiła, J. Adamski and D. Krzywański, LOD
142. "Komasówka" Reservation, Province of Sieradz, deciduous forest, 24.06.1960, R. Sowa, LOD
143. Kochce near Lubliniec, Province of Częstochowa, oak-hornbeam thickets, 25.07.1974, U. Bugdal and L. Dudek, KTU
144. Boronów, Province of Częstochowa, mixed forest, 20.06.1978, K. Ptak, KTU
145. "Zielona Góra" Reservation, Province of Częstochowa, *Tilio-Carpinetum*, 06.06.1973, S. Wille, KTU
146. Myszków, Province of Częstochowa, forest, 21.05.1934, M. Gawłowska, KRA
147. "Świnia Góra" Reservation, Province of Kielce, Forest Inspectorate Bliżyn, beech forest, 29.06.1965, H. Piękoś, KRAM
148. Ślōdków near Kraśnik, Province of Lublin, loessic ravine, 03.08.1959, D. Fijałkowski, LBL
149. Klemensów, Province of Zamość, park glade, 10.07.1970, E. Mahorowska, LBL
150. Kosobudy Forest Inspectorate, Province of Zamość, beech forest 03.08.1957, K. Izdebski, LBL
151. Łabunie, Province of Zamość, beech forest, 22.08.1949, J. Motyka, LBL
152. Skomorochy Małe near Skierbieszów, Province of Zamość, sunny, chalk slope, 12.06.1959, D. Fijałkowski, LBL
153. Metelin near Hrubieszów, Province of Zamość, oak forest, 03.07.1949, D. Fijałkowski, LBL
154. Sahryń near Hrubieszów, Province of Zamość, light oak-hornbeam forest, 25.05.1978, Z. Najdzińska, LBL
155. Modryń near Hrubieszów, Province of Zamość, light oak-hornbeam forest, 25.05.1978, Z. Najdzińska, LBL

156. Kudowa-Zdrój, Province of Wałbrzych, near serpentine, in ravine of a stream flowing through the spa, 23.06.1953, J. Mądalski, hb. Mąd.^x
157. Przyłęk, Province of Wałbrzych, 21.09.1960, A. Kwiatkowska, KRA
158. Niemodlińskie Forests, Province of Opole, forest at the Ścinawa River, 04.08.1978, W. Głombica, KTU
159. Włostowa near Korfantów, Province of Opole, oak-hornbeam forest on the bank of mill-race, 07.08.1978, W. Głombica, KTU
160. Ściborzyce Wielkie near Głubczyce, Province of Opole, 15.09.1972, S. Wike and K. Rostański, KTU
161. Rozumice near Głubczyce, Province of Opole, Szczyty Forest Inspectorate, *Tilio-Carpinetum*, 15.09.1972, S. Wike, KTU
162. Rozumice near Głubczyce, Province of Opole, 11.07.1973, F. Celiński and S. Wike, KTU
163. "Obora" Forest near Racibórz, Province of Katowice, 14.06.1972, A. Sendek, KTU
164. Tworków, Province of Katowice, forest, 18.08.1978, P. Sirek, KTU
165. Bażanowice near Goleiszów, Province of Bielsko-Biała, oak-hornbeam forest, 19.07.1975, Zabłocka and Zborek, KTU
166. Jasieniowa (Mt.) S of Goleiszów, Province of Bielsko-Biała, 28.06.1914, A. Żmuda, POZ, KRAM, TRN, WA
167. Chelm (Mt.) SE of Goleiszów, Province of Bielsko-Biała, 28.06.1917, A. Żmuda, KRAM
168. Sikornik, Province of Kraków, thickets, 04.06.1910, A. Żmuda, POZ, KRAM, TRN
169. Tyniec, Province of Kraków, forest on Grodzisko Hill, 24.06.1968, J. Bławiczak, KRA
170. Ludwinów (at present a part of Cracow), Province of Cracow, in willow brake at the Wilga Stream, 31.05.1910, A. Żmuda, POZ, KRAM
171. Between Chobot and Ispina, Province of Cracow, Niepołomice Forest, by a tunnel of water, 01.07.1978, M. Mizianty, MM
172. Ispina, Province of Cracow, oak-hornbeam forest near Wisła dam, 26.08.1952, A. Jasiewicz, KRAM
173. Bilinówka, near Zakopane, Province of Nowy Sącz, thickets, 890 m a.s.l., 10.09.1955, E. Pancer, KRA
174. Hala Smytnia in Kościeliska Valley, Tatra (Mts.), Province of Nowy Sącz, clearing, 06.08.1910, A. Żmuda, KRAM
175. Between Falsztyn and Niedzica-Zamek, Province of Nowy Sącz, alder forest, 02.07.1964, K. Grodzińska, KRAM
176. Polana Sutrówka, Pieniny Mts., Province of Nowy Sącz, edge of the forest, 15.07.1987, M. Mizianty, MM
177. Kłęczany, Province of Nowy Sącz, beech forest not far from quarries, 19.09.1977, M. Mizianty, MM
178. Strzeszyce near Laskowa, Province of Nowy Sącz, moist, mixed forest, at the stream, 03.07.1978, M. Szewczyk, KRAM
179. Rożnów, Province of Nowy Sącz, mixed forest above dam, 11.07.1946, A. Środoń, KRAM
180. Dąbrowska Góra (Mt.), Rożnów Plateau, Province of Nowy Sącz, 29.07.1919, B. Pawłowski, KRAM
181. Cieklinka (Mt.), in Beskid Niski (Mts.), Province of Krosno, E slope of mountain, 21.06.1956, E. Pancer, KRAM
182. Vicinity of Nowy Żmigród in Beskid Niski (Mts.), Province of Krosno, beech forest, 21.06.1956, K. Zarzycki, KRAM
183. Vicinity of Roztoki in Beskid Niski (Mts.), Province of Krosno, at the Pielnica stream, 11.08.1956, K. Grodzińska and E. Pancer, KRAM
184. Rymanów-Zdrój, Province of Krosno, fir forest, sand stone, 11.07.1925, K. Piech, KRAM
185. Rymanów-Zdrój, Province of Krosno, clearings in fir forest, 11.07.1928, K. Piech, KRAM

186. Puławy at Wisłok river, Province of Krosno, 02.07.1957, K. Grodzińska and E. Pancer, KRAM
187. Zawoje near Wernejówka, Province of Krosno, 09.08.1956, K. Grodzińska and E. Pancer, KRAM
188. Bełchówka near Sanok, Province of Krosno, hornbeam-beech forest, 29.07.1934, K. Piech, KRAM
189. Bełchówka near Sanok, Province of Krosno, border of the thickets, 29.07.1934, K. Piech, KRAM
190. Trześniów, Province of Krosno, border of the forest above the village, 09.09.1971, J. Bober, KRA
191. Strachocina, Province of Krosno, deciduous forest S of village, 13.09.1971, J. Bober, KRA
192. Mrzygłód, Province of Krosno, S of village, coppice on the high bank of the San River, 15.09.1971, J. Bober, KRA
193. Podlas near Mrzygłód, Province of Krosno, beech forest, 16.09.1971, J. Bober, KRA
194. Srogów, Province of Krosno, foot of hill, at the stream, 10.06.1972, J. Bober, KRA
195. Wroczeń (Mt.), Dynowskie Plateau, Province of Krosno, S slopes of mountain, beech-hornbeam-birch forest, 14.09.1971, J. Bober, KRA
196. Kopacz (Mt.), Dynowskie Plateau, Province of Krosno, S of mountain, between foot of mountain and stream, 10.06.1972, J. Bober, KRA
197. Between Wara and Niewiastka, Province of Krosno, at the border of deciduous forest, 26.06.1972, J. Bober, KRA
198. Lipnik, Province of Krosno, SW part of forest, 22.09.1971, J. Bober, KRA
- Luka, Boguslavskaya obl., oak forest, 05.07.1929, G. Kleopov, KW
- Goloseyevo (at present park in Kiev), 27.07.1942, ..., KW
- Winogradsky Monastyr, Kirowogradskaya obl., oak forest, 16.06.1925, G. Kleopov, KW
- Yasyenyeyo, Moskovskaya obl., oak forest, 01.07.1967, V. V. Makarov, JE
- Novo-Aydar, Woroshilovgradskaya obl. (DON-BAS), 2 km S from village, forest, 14.06.1939, Bilyk, KW
- Shack, Wolynskaya obl., clearings in forest, pastures, 06.10.1965, Mielnik, LWD
- Krimnye, Wolynskaya obl., hornbeam forest, 31.07.1949, Kosec, KW