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The occurrence of *Cannabis sativa* L. in the city of Lublin

Występowanie *Cannabis sativa* L. na terenie miasta Lublina

INTRODUCTION

Genus *Cannabis* L. represented only by the species *C. sativa* L. is formed in two subspecies: *sativa* L. and *indica* (Lam.) Small et Grong (12, 15, 16, 31). The two hemp (*Cannabis*) subspecies are characterized by the distinctly different natural geographical distribution (1, 11, 13, 15). One – subspecies *indica* – occurs in South Asia, Africa, South America and Central America, the other – subspecies *sativa* L. – is typical of the areas of all Europe, North America and the northern part of Asia. The borderline between the limits of the two hemp subspecies runs approximately along the parallel of 30 degrees of north latitude.

Hemp is believed to be one of the oldest plants grown in different parts of the Continent (2, 3, 10, 22, 34). It was grown first of all for fibre (stems) and for different medicines, oils and foods as well as animal feed (seeds), and for producing hashish (the inflorescence part of the stem). The world's oldest hemp crops were reported in China (28th c. B.C.) and in India (7-9th c. B.C.). In Europe first instances of hemp farming date back to the Silesian neolith (22, 34). In the territory of Poland first traces of hemp occurrence in synanthropic stations are known from the Early Middle Ages (2, 3, 10, 15, 18, 22, 32). This is a plant that requires fertile habitats with good light and moisture conditions. The most favourable conditions for growing hemp are found on alluvial soils, black-carths and brown soils and others of similar kind formed on the loess substratum or on limestone rocks. Hemp easily spreads through self-seeding and runs wild in segetal and ruderal habitats rich in nitrate compounds. These plants do not tolerate highly acidified soils, permanently or intermittently highly moistened, formed on high peat bogs or on sand-containing podzolic soils. When grown in

different parts of the world, hemp easily adapts to the existing climatic conditions ranging from the boreal to subtropical zone, where it exhibits a high diversity of ecotypical forms at the same time (11, 22).

In the territory of Poland the species *Cannabis sativa* L. is formed only in the ssp. *sativa* L. in two variants: var. *sativa* and var. *spontanea* Vavilov (15, 16 and references therein). The third distinguished mixed hemp variety – var. *intersita* Sojak – has so far not been recorded in Poland (15, 16). These subspecies can essentially be distinguished only on the basis of morphology of their seeds (15).

The two distinguished hemp varieties were regarded as separate species: var. *sativa* – as farmed crops – *Cannabis sativa* L., var. *spontanea* as ruderal plants run wild – *Cannabis ruderalis* Janisz. (15, 16). In Poland the most favourable conditions for hemp growing are found in the Lublin macro-region, and to a lesser extent in the Jarosław and Kraków-Kielce regions (3, 22).

The existing data collected from the territory of Poland on the distribution of synanthropic hemp stations in specific variants are fragmentary, just as from other countries (cf. 14, 16, 26, 28, 30). From the Lublin area the existing data on hemp occurrence come only from a dozen or so stations of phytosociological records of synanthropic communities (7, 29). Sparse stations of *Cannabis ruderalis* were recorded in other towns in the Lublin region (8, 9)

THE SCOPE AND METHODS OF INVESTIGATION

The occurrence of two variants of the subspecies *Cannabis sativa* ssp. *sativa*: var. *sativa* and var. *spontanea* in the Lublin area was characterized. Account was taken of the spatial distribution of stations of those plants, their ecological properties and presence in specific plant communities and outside them as well as the dynamics of their historical expansion. This information was prepared on the basis of the existing data taken from literature (7, 29), the collected herbarium materials and the supplementary field studies on the subject conducted in 1993-1998.

Figure 1 presents all stations of *Cannabis sativa* in Lublin, published so far and newly discovered. The phytosociological profile of plant communities with *Cannabis sativa* was prepared on the basis of 77 phytosociological records specified in Tables 2-5 and located in Figure 1.

The phytosociological studies of communities with hemp were conducted in compliance with the generally accepted rules of phytosociology (20, 24). The syntaxonomic membership of the vast majority of plant species was given chiefly after Matuzkiewicz (20) and Oberdorfer (23), and in very few cases after other authors (25, 29). The naming of bryophyte and pteridophyte species and flower plants was given after Koponen et al. (17) and Mirek et al. (21) respectively.

Chemical properties of the soils of plant communities characterized by the presence of *Cannabis sativa* were studied on the basis of eleven soil samples. They were taken from the areas of the greatest rooting of the plant in question during September and October 1998. In the Provincial Chemical-Agricultural Centre in Lublin specific methods (5) were used to determine, in the soil samples collected, the content of: P (colorimetrically, using the vanadium-molybdenum method), N (with potentiometer), K and Ca (using the flame method), Mg (with the AAS method), humus (with the Tiurin method) and soil reaction. The results of chemical analyses of soils were listed in Table 1. The appended photographs illustrate the currently most representative stations of *Cannabis sativa* preserved in the Lublin city area (Figs 3-6).

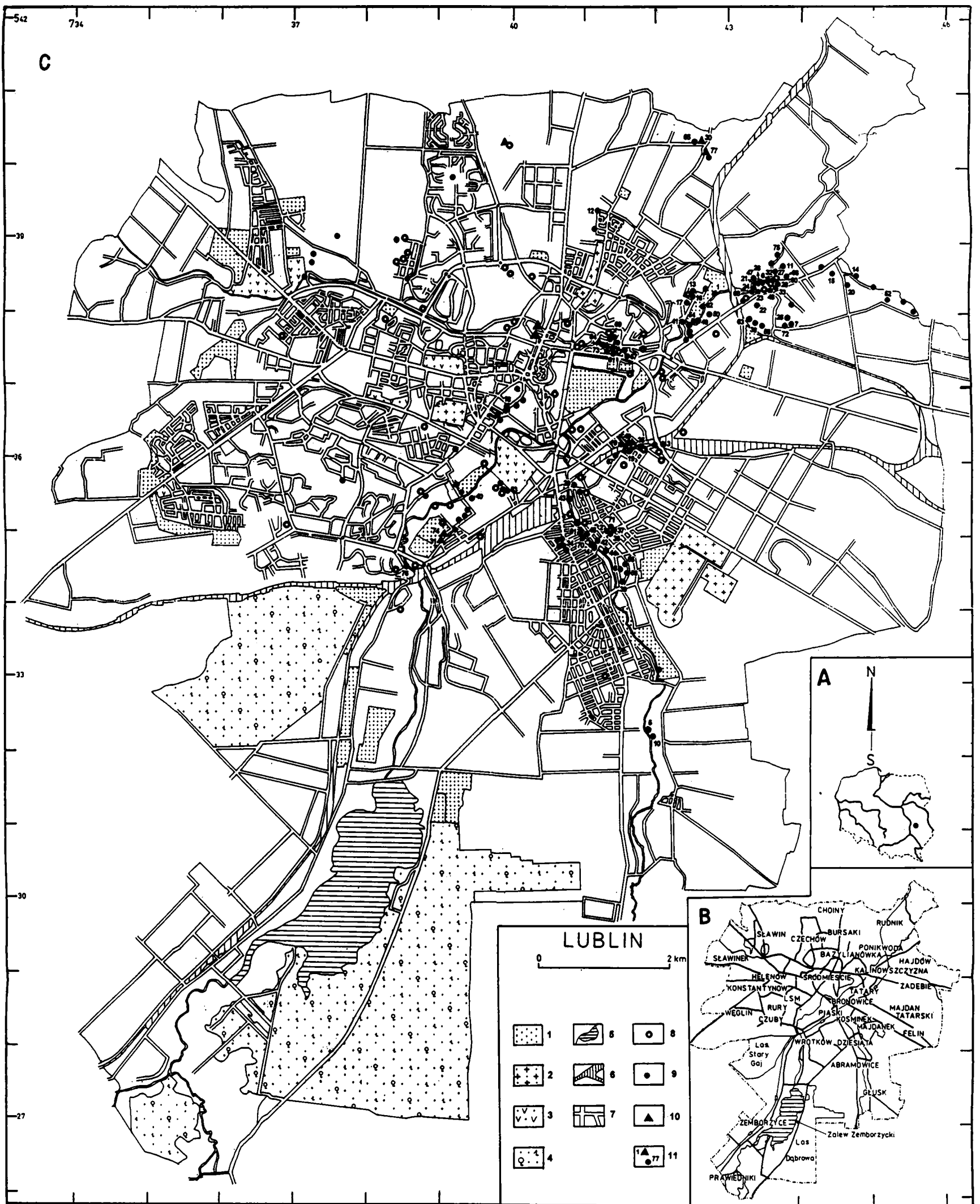


Fig. 1. Map of the occurrence of *Cannabis sativa* in the city of Lublin; A – position of Lublin on the map of Poland, B – major districts and physiographic objects of the city of Lublin, C – city map of Poland: 1 – allotment gardens, 2 – cemeteries, 3 – city park, 4 – forests, 5 – drainage network (rivers, reservoir), 6 – railway tracks, 7 – main highways, 8 – hemp stations published earlier as *Cannabis ruderalis* (7, 29), 9 – stations of *Cannabis sativa* ssp. *sativa* var. *spontanea*, 10 – stations of *Cannabis sativa* ssp. *sativa* var. *sativa*, 11 – station of 77 phytosociological records

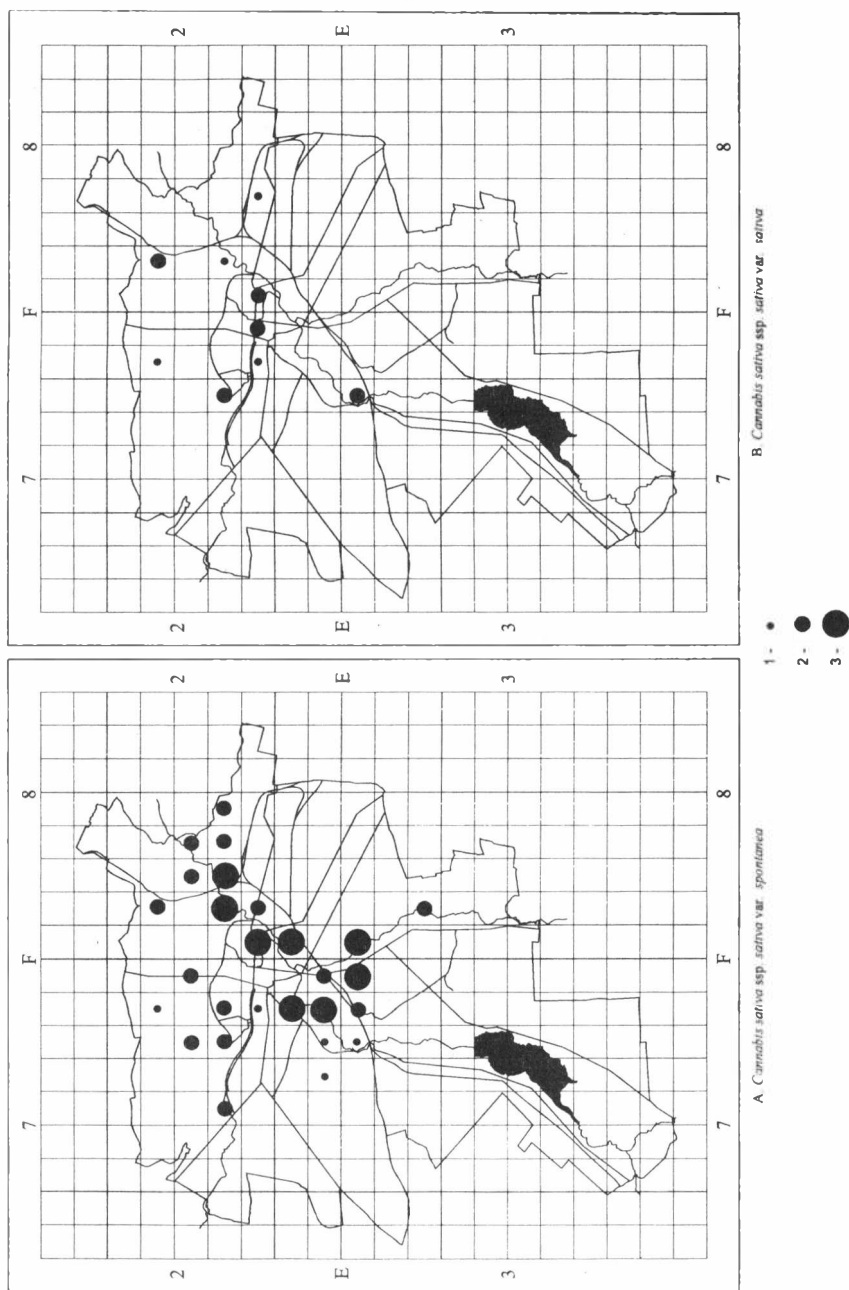


Fig. 2. Numbers of station of *Cannabis sativa* ssp. *sativa* in variants: *spontanea* (A) *i sativa* (B) in the city of Lublin; 1 - 1 stations, 2 - 2 to 5 stations, 3 - > 5 stations NB. The maps were drawn in the A.TPOL. cartographic lattice, large squares of 10 km by 10 km - FE: 27, 28, 37, 38; small squares of 1 km by 1 km - 0-99

THE NATURAL ENVIRONMENT OF THE CITY OF LUBLIN

The provincial capital city of Lublin is characterized by specific physical-geographic and town-planning conditions (4, 7, 27, 29, 33). Its current administrative boundaries comprise 144.5 sq. km with a population of 356 thousand. It is situated on a small river called Bystrzyca at the intersection of subsidiary tributaries: the Czerniejówka and the Czechówka. At the southeastern outskirts of the city a recreational reservoir on the Bystrzyca was built in 1974. In all city outskirts there are enclaves of rural ploughed fields with several forest complexes of different size scattered among them. In Lublin there are several parks, allotment gardens and cemeteries with varying degrees of tree-coverage. In the northeast part of the city the Botanical garden was set up in the early 1970s. In the wide Bystrzyca valley there are frequent yet small and scattered clusters of highly deformed leafy forests of the *Alno-Padion* alliance.

Table 1. Some chemical properties of soils in Lublin area among synantropical communities with *Cannabis sativa* ssp. *sativa* (Tables 2-5)

sample of soil	Number of		Depth of horizon in cm	pH in H ₂ O/dest.	Content in mg/l					Salinity in g KCl/l	Content of humus in %
	records	community			N-NO ₃	P	K	Ca	Mg		
1	3	2	5-20	8,2	47	31	120	3200	143	0,27	1,09
2	10	5	5-20	7,2	13	100	60	2500	40	0,03	2,11
3	11	5	10-20	7,7	15	25	90	4200	140	0,31	1,61
4	22	6	10-20	7,1	131	360	470	2570	380	1,19	11,17
5	30	6	10-20	7,8	53	38	285	3720	200	0,39	3,41
6	31	7	5-20	7,6	42	78	130	2120	185	0,27	8,12
7	36	8	10-20	7,7	90	82	520	3270	206	0,61	4,22
8	39	9	10-20	8,1	54	33	240	3160	156	0,36	0,81
9	49	14	10-20	7,7	20	82	220	2740	110	0,27	1,54
10	57	15	10-20	7,7	49	28	70	3120	206	0,51	90,11
11	63	15	10-20	7,6	32	43	80	3900	100	0,31	16,61

Lublin is distinguished *inter alia* for its not too high annual average rainfall (576 mm), its fairly high annual air temperature (7.4°C) and a comparatively high insolation rate (4.5 h/day). The city is built up on the highly folded part of the Lublin-Lvov Upland (Lublin Upland) situated at 170-220 m above sea level on the borderline of the Nałęczów Plateau and Świdnik Plateau.

In the area of Lublin the oldest bedrock is made up of cracked limy-slimy marls (4, 27). These are covered by several kinds of Quaternary covers (4, 27, 29). Among them the most widespread are thick loess beds with a mosaic of loam, sand and gravel heaps of varying size. The first of these Quaternary cover forms prevails spatially in the eastern part of the city while the other three dominate in scattering on surfaces of varying size in the western part.

Within the city boundaries there are several natural soil forms (6.27, 29). The most widespread are brown, podzolic and alluvial soils. Brown soils are commonly found on loess and boulder loam. Alluvial soils of the dusty-sandy humus type are found in the terraces of the Bystrzyca river and its tributaries. Podzolic and grey-brown soils dominate on Quaternary sand and gravel beds. In sparse and mainly steep places with cropping out limy-slimy marl rocks there are highly skeletal marl soils. Within the city limits, highly fertilized, mesophilous, loamy and dusty deep soils of the wheat-beet type dominate in the plough fields. Almost all natural soil forms, found within the densely built-up areas of the city and at its most built-up outskirts and transport routes, have been anthropogenically transformed to a highly varying degree (27, 29). The pollution of the natural environment in the zones of Lublin is fairly considerably diversified (19, 27).

THE PHYTOSOCIOLOGICAL AND ECOLOGICAL PROFILE OF PHYTOCENOSES WITH *CANNABIS SATIVA* SSP. *SATIVA*

THE PHYTOSOCIOLOGICAL TAXONOMY OF BASIC PHYTOCENOSES

CL. – Class, O. – Order, All. – Alliance, Comm. – Community, Ass. – Association

- CL. *Phragmitetea* R. Tx. et Preisg. 1942
 O. *Phragmitetalia* Koch 1926
 All. *Phragmition* Koch 1926
 1. Comm.: with *Phragmites australis*
- CL. *Polygono arenastri-Poëtea annuae* Rivas-Martinez 1975 corr. Rivas-Martinez et al. 1991
 O. *Polygono arenastri-Poëta annuae* R. Tx. in Gêhu et al. 1972 corr. Rivas-Martinez et al. 1991.
 All. *Matricario matricarioidis-Polygonion arenastri* Rivas-Martinez 1975 corr. Rivas-Martinez et al. 1991
 2. Ass. *Polygono-Matricarietum discoideae* (Siss. 1969) Tx. 1972
- CL. *Chenopodietea* Oberd. 1957 em. Lohm., J. et R. Tx. 1961.
 O. *Polygono-Chenopodietalia* (R. Tx. et Lohm. 1950) J. Tx. 1961.
 All. *Eu-Polygono-Chenopodion* Siss. 1946
 3. Ass. *Galinsogo-Setarietum* (R. Tx. et Beck. 1942) R. Tx. 1950
- O. *Sisymbrietalia* J. Tx. 1961
 All. *Sisymbriion* R. Tx., Lohm., Preisg. 1950
 4. Comm.: with *Atriplex patula*
 5. Ass. *Chenopodietum ruderale* Oberd. 1957
 6. Comm.: with *Cannabis sativa*
 7. Comm.: with *Iva xanthifolia*
 8. Ass. *Hordeo-Atriplicetum tataricae* Prodan 1943
 9. Ass. *Atriplicetum nitentis* Knapp 1945
 10. Ass. *Erigeronto-Lactucetum* Lohm. 1950
- CL. *Agropyretea repentis* (Oberd. et al. 1967) Müller et Gôrs 1969
 O. *Agropyretalia repentis* Oberd., Th. Müller etô Grs in Oberd. et al. 1967
 All. *Convolvulo-Agropyriion* Gôrs 1966
 11. Comm.: with *Conyza canadensis*
 12. Comm.: with *Cirsium arvense*
 13. Comm.: with *Bromus inermis*

- CL. *Artemisietea vulgaris* Lohm., Preisg. et R. Tx. 1950
 O. *Onopordetalia acanthii* Br.-Bl. et R. Tx. 1950
 All. *Onopordion acanthii* Br.-Bl. 1926
 14. Ass. *Echio-Melilotetum* R. Tx. 1931 em. Lohm. 1950
 All. *Eu-Arction* R. Tx. 1937 em. Siss. 1946
 15. Ass. *Tanaceto-Artemisietum vulgaris* Br.-Bl. (1931) 1949
 16. Comm.: with *Urtica dioica*
 17. Ass. *Balloto-Chenopodietum* R. Tx. 1931 em. Lohm. 1950
 18. Comm.: with *Lamium album*
 19. Ass. *Leonuro-Arctietum tomentosum* (Felfldy 1942) Lohm. ap. R. Tx. 1950
 All. *Alliarion* Oberd. (1957) 1952
 20. Ass. *Impatienti-Convolvuletum* Hilbig. 1971
 21. Ass. *Chelidonio-Robinetum* (Jurko 1963) Pacyniak

SURVEY OF PHYTOCENOSES

1. Community with *Phragmites australis* (Table 2, rec. 1)

It is distinguished primarily on account of the absolute domination by *Phragmites australis* often accompanied, but to a lesser degree, by *Cannabis sativa* ssp. *sativa* var. *spontanea*, over other plant species. The community was recorded only in one expanse on strongly anthropogenically deformed slimy alluvial soil.

Phytosociological record: 1. Kalinowszczyzna, the Bystrzyca river valley, on the fringe of riverside bush near the Kalina allotment garden; humous alluvial soil, dusty-sandy.

2. Association *Polygono-Matricarietum discoideae* (Table 2, rec. 2-3)

The studied form of the association is formed in two facies. One is characterized by the almost absolute domination of *Polygonum aviculare*, the other exhibits co-dominance by the species in question together with *Iva xanthiifolia* and *Trifolium repens*. In both facies there is *Cannabis sativa* ssp. *sativa* var. *spontanea*, which grows in scanty numbers and probably transitionally. The facies with *Polygonum aviculare* occurs on the ruderal substratum with a more solid surface than the facies with *Iva xanthiifolia* and *Trifolium repens*.

Phytosociological records: 2. In Rozstajna St., a loamy site with a compact surface rich in grit. 3. Between Plage and Laškiewiczza St. and Al. (Ave.) Witosa, a site with a loose, littered, loamy-sandy surface with marl crumbs.

3. Association *Galinsogo-Setarietum* (Table 2, rec. 4-7)

In this fragmentarily formed association, worth noting is the domination, chiefly mixed, less often single, by several species indicative of root-plant communities and typically ruderal. These are most often: *Galinsoga ciliata*, *G. parviflora* and *Echinochloa crus-galli*, less frequently: *Cannabis sativa* ssp. *sativa* var. *spontanea*, *Chenopodium album* and *Artemisia vulgaris*. These plant species, especially the first three, make up the comparatively most clearly distinguished facies patterns. The phytocenosis is recorded fairly seldom, mainly in root and cereal crops on fertile, mesophilous humous alluvial soils.

Phytosociological records: 4. Kośminek, the Czerniejówka river valley, Nadrzeczna St., at the entrance to Prózna St.; a local depression, the fringe of a deserted allotment garden on half-bog soil. 5. Abramowice, the Czerniejówka river valley, a fodder beet crop on dusty-sandy humous alluvial soil. 6. Hajdów, the Bystrzyca river valley, in a potato crop on dusty-sandy humous alluvial soil. 7. In Ząbnie St., in a potato crop on dusty-sandy humous alluvial soil.

4. Community with *Atriplex patula* (Table 2, rec. 8)

The community is characterized by the absolute domination of *Atriplex patula* over the other numerous plant species occurring in it. The numerical strength of specimens of *Cannabis sativa* ssp. *sativa* var. *spontanea* present therein is very low. The community represents a succession development form of field crops communities towards fallow communities. It was recorded in one station only.

Phytosociological record: 8. In Robotnicza St., at the exit of Mickiewicza St., an old idle land on a dusty-sandy humous substratum.

5. Association *Chenopodietum ruderale* (Table 2, rec. 9-20)

In respect of the general floristic composition this association is characterized primarily by a high degree of quantitative superiority of *Chenopodium ruderale* over other plant species recorded in it. The specimens of *Cannabis sativa* ssp. *sativa* var. *spontanea* found in the association most often grow single, less frequently in a small density. Nine facies were distinguished in this association: one typical and the remaining eight characterized by specific plant species dominating as single or in groups. In Lublin this is the most common form of the association *Chenopodietum ruderale* marked by the presence of *Cannabis sativa* ssp. *sativa* var. *spontanea*. It is recorded most often on a loamy-rubble, dusty-sandy loess substratum with a poorly compact surface.

Phytosociological records: 9. Near the Żytnia St. exit, at a garden fence, the slope of the railway embankment with a littered, gravel-loamy surface. 10. Abramowice, the Czerniejówka river valley, near a fence; dusty-sandy, humous alluvial soil. 11. In Łagiewnicka St., near the sewage treatment plant, the slope of a littered heap of rubble, loam and sludge. 12. Near the junction of Brzaskwiniowa St. and Jagodowa St., a small, domed loam-rubble waste heap. 13. In Zawilcowa St., the flat fringe of a highly littered rubble and loam dumping ground. 14. Jarmarczna St., a small, domed loam-rubble waste heap. 15. Turystyczna St., near the Kasprowicza St. exit, the sloping ridge of a loam-rubble waste heap. 16. Zawilcowa St., the edge of the municipal rubble dumping ground, over a local depression, the substratum with a levelled, littered dusty-sandy surface with concrete crumbs. 17. The corner of Zawilcowa St. and Wrzosowa St., a highly littered slope of the building rubble and loam dumping ground. 18. In Dolna Panny Marii St., at the foot of the scarp, a dug-out loess site. 19. Near the Rolna St. exit, near the railway track; a site with a highly littered loam-rubble surface. 20. The corner of Kasprowicza St. and Jarmarczna St., an old sandy-rubble waste heap.

6. Community with *Cannabis sativa* (Table 3, rec. 21-30)

Generally this is a community fairly rich in species. In respect of the general floristic composition it is diversified into two basic subordinate forms characterized by the exclusive presence and at the same time by the distinct domination of a specific variety of *Cannabis ativa* ssp. *sativa*: one with var. *spontanea*, the other with var. *sativa*. In both forms of this community there are *Ballota nigra* and *Agropyron repens* in almost equally large densities. Moreover, the two subordinate forms of the community with *Cannabis sativa* are characterized by scanty occurrences of other plant species that grow as single or in groups in a greater density, and make up five weakly distinguished facies. The community was recorded most often on the ruderal substratum of the type of sand-containing loess and loam-rubble waste heaps. It is seldom found in cereal crops on riverine humous alluvial soils.

Phytosociological records: 21. Hajdów, the Bystrzyca river valley, the fringe of riverine bush near a plough field, dusty-sandy alluvial soil. 22. In Turystyczna St., at the farm buildings; a local depression on the edge of plough fields, a dry substratum: slimy-clayey, covered with rubble and litter. 23. Hajdów, the Bystrzyca river valley, a wheat crop on dusty-sandy humous alluvial soil. 24. Hajdów, the Bystrzyca river valley, the fringe of riverine bush near a plough field, dusty-sandy humous alluvial soil. 25. Łuszczowska St., an idle farming plot near a rural building; a dusty substratum with a highly littered and humous surface. 26. Hajdów, the Bystrzyca river valley, on the river bank, wet slimy alluvial soil: humous, dusty-sandy. 27. Hajdów, the Bystrzyca river valley, the fringe of riverine bush near a plough field; dusty-sandy humous alluvial soil. 28. Hajdów, the Bystrzyca river valley, a field boundary on dusty-sandy, poorly humous alluvial soil. 29. In Garbarska St., a grove with *Robinia pseudacacia*, a loess substratum with a littered, loamy-rubble surface. 30. In Dożynkowa St., near the Orzechowa St. exit, at a field road; a loess substratum with a littered, loamy-rubble surface.

Table 3. 6 – community with *Cannabis sativa* in variants: 6.1 – with *Cannabis sativa* ssp. *sativa* var. *spontanea* (in form: 6.1.1 – typical, 6.1.2 – with *Echinochloa crus-galli*, 6.1.3 – with *Agropyron repens* and *Iva xanthiifolia*, 6.1.4 – with *Ballota nigra* and *Artemisia vulgaris*), 6.2 – with *Cannabis sativa* ssp. *sativa* var. *spontanea*, in facies with *Carduus crispus*; 7 – community with *Iva xanthiifolia* in variants: 7.1 – with *Cannabis sativa* ssp. *sativa* var. *sativa*, 7.2 – with *Cannabis sativa* ssp. *sativa* var. *spontanea*; 8 – associations: *Hordeo-Atriplicetum tataricae* in variants: 8.1 – with *Iva xanthiifolia* i *Atriplex nitens*, 8.2 – with *Atriplex tatarica*; 9 – association: *Atriplicetum nitentis* in variants: 9.1 – typical with *Atriplex nitens*, 9.2 – with *Cannabis sativa* ssp. *sativa* var. *spontanea*; 10 – association: *Erigeronto-Lactucetum* in variants: 10.1 – with *Atriplex nitens*, 10.2 – with *Artemisia vulgaris*. (x) – as in Table 2

	6										7		8		9		10						
	1.		2.		3.		4.		1.	2.	1.	2.	1.	2.	1.	2.							
Number of community	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43
Area of plot in m ²	30	30	100	48	12	18	24	15	25	16	6	8	25	30	30	35	35	100	25	20	15	16	20
Cover of herb layer in %	100	80	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
Cover of moss layer in %	-	-	-	-	-	-	-	-	-	-	-	-	-	r	-	-	-	-	-	-	-	-	-
Number of species in record	19	14	20	15	15	20	12	22	13	15	9	13	18	20	17	13	8	22	22	17	19	19	17
I. Cultivated plants																							
<i>Triticum aestivum</i>	.	.	5	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
II. Ch: a - <i>Phragmitetea</i> , b - <i>Cyperetalia fusci</i> (x), c - <i>Bidentetalia tripartiti</i> , <i>Bidentetalia tripartiti</i> , <i>Chenopodium fluviatile</i>																							
a <i>Phragmites australis</i> (D:1)	3	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
c <i>Polygonum lapathifolium</i> ssp. <i>lapathifolium</i>	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
III. Ch: a - <i>Molinio-Arrhenatheretea</i> (x), b - <i>Arrhenatheretalia</i>																							
b <i>Anthriscus sylvestris</i>	.	.	r	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
b <i>Dactylis glomerata</i>	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
b <i>Daucus carota</i>	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
b <i>Taraxacum officinale</i>	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
IV. Ch: a - <i>Trifolium fragiferi-Agrostietalia</i> (x), b - <i>Plantagetalia majoris</i> , <i>Polygonion avicularis</i> ; c - <i>Polygono arenastri-Poetea annuae</i>																							
b <i>Plantago major</i>	+	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
b <i>Lolium perenne</i>	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
c <i>Polygonum aviculare</i> (Ch: 2)	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.

7. Community with *Iva xanthiifolia* (Table 3, rec. 31-34)

The community is marked primarily by a very dense cover of high herbaceous plants, the major being *Iva xanthiifolia*. There are two subordinate phytocenosis forms in it, which are characterized by the exclusive co-domination of a specific variety of *Cannabis sativa* ssp. *sativa*: one with var. *sativa*, the other with var. *spontanea*. The former community variety occurs less often than its other form. The other recorded plant species occur in this community rarely, mainly as single specimens. The community with *Iva xanthiifolia* marked with the presence of *Cannabis sativa* ssp. *sativa* var. *sativa* was recorded most often on the substratum of loam (containing sand at different degrees), loess and ripery humous alluvial soils, less often on the substratum of the sandy-rubble type.

Phytosociological records: 31. In Ciepla St., near 'Sygnał' allotment gardens, the substratum with a highly littered, sandy-dusty, humous surface. 32. Hajdów, the Bystrzyca river valley, the fringe of an old fallow on dusty-sandy, humous alluvial soil. 33. Hajdów, the Bystrzyca valley, an old fallow on dusty-sandy, humous alluvial soil. 34. Between Czeska St. and Kwiatowa St., near the wall of a tenement house, the substratum with a littered, sandy-rubble surface.

8. Association *Atriplicetum tataricae* (Table 3, rec. 35-37)

The fragmentarily developed form of the association *Atriplicetum tataricae* is characterized primarily by the highest percentage of *Atriplex tatarica* with a fairly high co-occurrence of *Cannabis sativa* ssp. *sativa* var. *spontanea*. Two variants were distinguished in it: with *Iva xanthiifolia* and *Atriplex nitens*, and with *Atriplex tatarica*. The former is related to both the previous community with *Iva xanthiifolia* and to the association *Atriplicetum nitentis* to be described later. The other recorded plant species, apart from the above three co-dominant species, occur fairly rarely, mainly as single specimens. In the studied area this form of the association in question occurs rarely, chiefly on a ruderal substratum of the loamy-rubble type.

Phytosociological records: 35. In Majdanek St., near the railway tracks, the site with a littered, loamy-rubble surface. 36. Near the Rozstajna St. exit, a littered loam, sand and rubble waste heap. 37. The corner of Rozstajna St. and Długa St., a littered, loamy-rubble waste heap.

9. Association *Atriplicetum nitentis* (Table 3, rec. 38-41)

The association is chiefly marked by very dense occurrences of *Atriplex nitens*. Two variants were distinguished that are characterized by specific plant species, dominating as single or mixed: typical with *Atriplex nitens* and with *Atriplex nitens* and *Cannabis sativa* ssp. *sativa* var. *spontanea*. Out of other plants

in some expanses of the association, *Chenopodium album*, *Lactuca serriola*, *Artemisia vulgaris* and *Ballota nigra* achieve a comparatively greater cover. In the studied area this association form was recorded rarely, mainly in habitats of the loamy rubble and sandy-dusty types.

Phytosociological records: 38. In Turystyczna St., the upper slope of an old littered loam and rubble dumping ground. 39. The corner of Robotnicza St. and Mickiewicza St., an old fallow on the loess substratum with a gravel-rich surface. 40. In Dzierżawna St., the sugar plant site, the slope of the water settler dam with a loamy-gravel-rubble surface. 41. In Azaliowa St., the Bystrzyca river valley, near a road, on dusty-sandy humous alluvial soil overshadowed by the *Salix alba* tree-crowns.

10. Association *Erigeronto-Lactucetum* (Table 3, rec. 42-43)

The association is distinguished mainly for the dense occurrences of *Lactuca serriola* and with a negligible percentage of *Cannabis sativa* ssp. *sativa* var. *sativa*. Two variants are clearly distinguished, which are characterized by greater co-participation of specific plant species: one – with *Ballota nigra* and *Atriplex nitens*, the other – with *Artemisia vulgaris* and *Agropyron repens*. The association was recorded in two stations only, formed on loamy-sandy-rubble waste heaps and sites.

Phytosociological records: 42. In Wspólna St., near the Krańcowa St. exit, the ridge of an old, highly littered loam and rock crumbs waste heap on the shallow marl substratum. 43. in Wspólna St., a ruderal site with a loose, littered, rubble-dusty-sandy surface.

11. Community with *Conyza canadensis* (Table 4, rec. 44-45)

The community is characterized by exceptionally numerous occurrences of *Conyza canadensis*. *Cannabis sativa* ssp. *sativa* var. *spontanea* recorded in this community occurs in sparse numbers, as single specimens. This is a ruderal, heterogeneous community in the process of floristic stabilization, on the substratum of desiccated, sand-containing loam or gravels, with a weakly compact surface.

Phytosociological records: 44. Near Robotnicza St., at the fence of allotment gardens, the substratum with a littered, sandy-loamy surface. 45. In Wspólna St., the levelled grass site with a sandy-gravel surface.

12. Community with *Cirsium arvense* (Table 4, rec. 46)

The community is characterized by the simplified composition of species, with a considerable domination of mainly *Cirsium arvense*, and to a lesser extent

of *Agropyron repens*. *Cannabis sativa* ssp. *sativa* var. *spontanea* occurs in it in negligible numbers. The community was found only on a small expanse of humous alluvial soil near fields under cultivation.

Phytosociological record: 46. Kalinowszczyzna, the Bystrzyca river valley, near the Kalina allotment gardens; a highly littered, dusty-sandy expanse of alluvial soil.

13. Community with *Bromus inermis* (Table 4, rec. 47)

The community is marked by the simplified species composition with the absolute domination of *Bromus inermis*. *Cannabis sativa* ssp. *sativa* var. *spontanea* was recorded in it only as several-species strong. The massive occurrence of the xerophilous grass species *Bromus inermis* on a mesophilous, humous alluvial soil is difficult to explain. This community may have been formed as a result of accidental sowing of this species.

Phytosociological record: 47. Hajdów, the Bystrzyca river valley, between the meadow and riverside bush; a dusty-sandy humous soil.

14. Association *Echio-Melilotetum* (Table 4, rec. 48)

This association form is primarily characterized by the absolute domination of *Melilotus alba* over the other plant species occurring in it. *Cannabis sativa* var. *spontanea* is recorded in it in as few as several specimens. The association was found only in one station.

Phytosociological record: 48. In Turystyczna St., the site with a littered, loamy-rubble surface.

15. Association *Tanaceto-Artemisietum* (Table 4, rec. 49-52)

In this form of a ruderal association characterized by the presence of *Cannabis sativa* ssp. *sativa* var. *spontanea*, on the basis of the single-species or mixed domination of specific plant species, three facies were distinguished: the first – with *Cannabis sativa* ssp. *sativa* var. *spontanea* and *Iva xanthiifolia*, the second – with *Chenopodium album* and *Agropyron repens*, the third – with *Tanacetum vulgare*. This is a fairly frequent form of phytocenosis. It was recorded on different kinds of substratum, most often of the loamy-rubble, sandy-loamy or loess types with a surface more or less rich in humus.



Fig. 3. Lublin, Hajdów. Occurrence of *Cannabis sativa* ssp. *sativa* var. *spontanea* in the station of phytosociological record no. 11
Fot. F. Świąg



Fig. 4. Lublin, Hajdów. Occurrence of *Cannabis sativa* ssp. *sativa* var. *spontanea* in the station of phytosociological record no. 24
Fot. F. Świąś

Florian Świąś, Małgorzata Wrzesień



Fig. 5. Lublin, Hajdów. Occurrence of *Cannabis sativa* ssp. *sativa* var. *spontanea* in the station of phytosociological record no. 25

Fot. F. Święs



Fig. 6. Lublin, Hajdów. Occurrence of *Cannabis sativa* ssp. *sativa* var. *spontanea* in the station of phytosociological record no. 73

Fot. F. Święs

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Phytosociological records: 49. In Turystyczna St., the Hajdowska St. exit, the fringe of an old fallow land, on the loess substratum with a highly humous surface. 50. The Żytńia St. exit, the slope of the railway embankment with a loamy surface rich in marl crumbs. 51. Hajdów, the Bystrzyca river, the fringe of riverside bush at the field under cultivation, a dusty-sandy, humous alluvial soil. 52. The Dąbrowska St. exit, on the Czerniejówka river, the site of a littered loam and building gravel dumping ground.

16. Community with *Urtica dioica* (Table 4, rec. 53-63)

The community is distinguished mainly for the most abundant occurrence of *Urtica dioica*. *Cannabis sativa* ssp. *sativa* var. *spontanea* recorded here grows most often as single species, seldom having a greater density. Two subordinate floristic forms of this community are poorly distinguished: typical with *Urtica dioica* and the other with *Urtica dioica* and *Artemisia vulgaris*. The former community form represents the more and more often described but still floristically indeterminate community with *Urtica dioica* while the latter form is related to the association *Urtico-Artemisietum* that is known chiefly from other European countries. The community with *Urtica dioica* often occurs in the area under investigation. It was recorded in various ruderal habitats, mainly as loamy-rubble waste heaps, humous alluvial soils, loess slopes and dusty-sandy and loamy sites.

Phytosociological records: 53. The Jarmarczna St. exit, the littered slumping loess slope of a ravine. 54. The Kawia St. exit, the sugar plant site, the fringe of a bank slope of the water settlement tank with a loamy-gravel-slimy surface. 55. In Azaliowa St., the Bystrzyca river, near the Kalina allotment gardens, a highly littered, dusty-sandy humous alluvial soil. 56. In Sokolniki St., a loamy-sandy site with a surface covered with litter and rubble. 57. In Robotnicza St., the valley between farming plots, a dusty-sandy humous alluvial soil. 58. In Tatarska St., at a garage wall, the substratum with a highly littered, sandy-humous surface. 59. In Turystyczna St., between a field under cultivation and a sewer trench; a dusty-sandy humous alluvial soil. 60. In Białkowska Góra St., near its exit to Kalinowszczyzna St., at the road, the substratum with a dusty-sandy humous surface. 61. Hajdów, the Bystrzyca valley, the fringe of riverside bush near a field under cultivation, a dusty-sandy humous alluvial soil. 62. Niska St., at a farm building, the loess substratum with a littered, sandy-humous surface. 63. Kalinowszczyzna, the Bystrzyca valley, near the Kalina allotment garden; a small, littered loamy-rubble waste heap.

17. Association *Balloto-Chenopodietum* (Table 5, rec. 64-69)

The association is distinguished primarily for the strong domination of *Ballota nigra* over other plant species occurring in it as single or in greater density. Three subordinate forms of this association are more or less distinctly marked in the rank of facies: typical, with *Urtica dioica*, and with *Leonurus cardiaca*. Out of the other plant species recorded in some expanses of this

c	<i>Ballota nigra</i> (D: 17)	5	4	4	5	4	5	2	.	2	3	2	+	+	2
c	<i>Arctium tomentosum</i> (Ch: 19)	+	.	+	1	+	+	+	4	3	r	3	.	.	+
c	<i>Leonurus cardiaca</i> (Ch: 19)	.	.	.	.	.	+	3	.	.	2	5	3	+	+
c	<i>Helianthus tuberosus</i>	.	.	.	.	.	+	.	.	+	.	.	.	.	.
c	<i>Arctium lappa</i> (Ch: 19)	.	.	.	.	.	.	.	.	.	.	.	.	.	+
c	<i>Lamium album</i> (D: 18)	.	.	.	.	.	.	5	.	.	.	.	.	.	.
d	<i>Chelidonium majus</i> (Ch: 21)	+	1	.	.	.	.	.	.	.	.	.	.	.	5
d	<i>Robinia pseudacacia</i> B (Ch: 21)	.	.	+	.	.	.	.	.	.	.	.	.	.	+
d	<i>Impatiens parviflora</i>	.	.	.	.	.	.	.	.	.	.	.	.	.	1
d	<i>Sicyos angulata</i>	.	.	.	.	.	.	.	.	.	.	.	.	.	+
d	<i>Impatiens grandulifera</i> (Ch: 20)	.	.	.	.	.	.	.	.	.	.	.	.	.	+
VII. Ch. <i>Agropyreteea repentis</i> , <i>Agropyretalia repentis</i> , <i>Convolvulo-Agropyron</i>															
	<i>Agropyron repens</i>	.	.	.	.	.	.	.	+	1	.	.	+	.	2
VIII. Ch. <i>Festuco-Brometea</i>															
	<i>Bromus inermis</i> (D: 13)	.	.	.	.	.	.	.	.	.	.	.	.	.	+
IX. Ch. <i>Sambuco-Salicion</i>															
	<i>Sambucus nigra</i> B	+	+	+	.	.	.	.	.	.	.	.	.	.	.
X. Others															
	<i>Galium aparine</i>	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	<i>Conyza canadensis</i> (D: 11)	.	.	.	.	.	.	.	.	.	.	.	.	.	+
	<i>Fallopia dumetorum</i>	.	.	.	.	.	.	.	.	.	.	.	.	.	+
	<i>Acer negundo</i> B	.	.	.	.	.	.	.	.	.	.	.	.	.	1
	<i>Acer negundo</i> A	.	.	.	.	.	.	.	.	.	.	.	.	.	3
	<i>Salix rosmarinifolia</i> A	.	.	.	.	.	.	.	.	.	.	.	.	.	2
Species occurring in 1 record I - <i>Bidens tripartita</i> 76/+; IIa - <i>Phleum pratense</i> 77/+; IIb - <i>Deschampsia caespitosa</i> 76/+; IIIa - <i>Lolium perenne</i> 69/+; IIIb - <i>Poa annua</i> 67/+; IVb - <i>Matricaria maritima</i> ssp. <i>inodora</i> 68/+; Va - <i>Solanum nigrum</i> 71/+; Vb - <i>Echinochloa crus-galli</i> 73/+; Vc - <i>Sonchus oleraceus</i> 66/+; <i>Galinsoga ciliata</i> (Ch: 30) 74/+; Vd - <i>Urtica urens</i> 74/+; <i>Descurainia sophia</i> 77/+; VIa - <i>Carduus crispus</i> 66/+; <i>Tanacetum vulgare</i> (Ch: 14) 67/r; VIb - <i>Melandrium album</i> 72/+; VIc - <i>Conium maculatum</i> 66/+; <i>Lycium barbarum</i> 69/+; <i>Armoracia rusticana</i> 72/+; VI d - <i>Torilis japonica</i> 65/+; <i>Bryonia alba</i> 73/+; <i>Solidago gigantea</i> 73/+; <i>Alyosoton aquaticum</i> 76/+; VII - <i>Convolvulus arvensis</i> 73/+; <i>Cirsium arvense</i> (D: 12) 75/+; X - <i>Symphoricarpos albus</i> 64/+; <i>Amaranthus retroflexus</i> 66/+; <i>Acer platanoides</i> B 71/+; <i>Geum urbanum</i> 71/+; <i>Aegopodium podagraria</i> 74/+; <i>Stellaria media</i> 74/+; <i>Fraxinus excelsior</i> B 77/+.															

association, only *Chenopodium album* and *Artemisia vulgaris* exhibit a comparatively greater density. The analysed form of the association *Balloto-Chenopodietum* occurs fairly often in the area under investigation. Most frequently it was recorded in fertile and mesophilous habitats like loam lying on loess, humous alluvial soils and loamy-rubble waste heaps.

Phytosociological records: 64. In Kalinowszczyzna St., near the Wincenty Pol manor house; the fringe of a deserted garden with a dusty-sandy humous surface. 65. In Dożynkowa St., near the Orzechowa St. exit, near the road; the loess substratum overshadowed by the *Robinia pseudacacia* crowns. 66. In Turystyczna St., a domestic rubbish-heap on a dusty-sandy humous alluvial soil soaked with liquid manure. 68. Hajdów, the Bystrzyca valley, the fringe of riverside bush, near a field under cultivation, a dusty-sandy humous alluvial soil. 69. In Dembowskięgo St., below the ridge of a loess scarp, in the grass among scattered scrub clumps with *Lycium barbarum*.

18. Community with *Lamium album* (Table 5, rec. 70)

It is characterized by very strong domination of *Lamium album*. Out of other recorded plant species only *Ballota nigra* exhibits a greater degree of cover. *Cannabis sativa* in the *spontanea* variety occurred in it only as several specimens. The community was found only in one station.

Phytosociological record: 70. The Łazienkowska St. exit, on the Czerniejówka river, a highly littered, dusty-sandy humous alluvial soil.

19. Association *Leonuro-Arctietum tomentosum* (Table 5, rec. 71-74)

The association is primarily characterized by the co-domination of several plant species forming first of all the two variants: with *Arctium tomentosum* and with *Leonurus cardiaca* and *Ballota nigra*. The former variant is formed chiefly in the facies with *Lactuca serriola* and *Cannabis sativa* var. *spontanea*. In the latter variant three more complex facies patterns are made up of the following species that grow in greater density: *Arctium tomentosum*, *Leonurus cardiaca* and *Cannabis sativa* var. *sativa*. Worth noting is the presence in it of both hemp varieties: *sativa* and *spontanea*. The former hemp variety occurs only in one and the latter in the other five expanses of the association. This association does not occur very often; it is found in ruderal habitats, mainly such as loamy-rubble, dusty-sandy types, loam lying on loess, and old dumping grounds for rubbish, earth and cinders; less often in other types.

Phytosociological records: 71. The corner of Rozstajna St. and Długa St., a demolition site with a highly littered, loamy-rubble surface. 72. In Zadębie St., at a farming building, in the disordered scrape and rubbish dumping ground, the loess substratum with a highly humous and littered surface. 73. The corner of Białkowska Góra St. and Niska St., the site of a rubbish, earth, gravel and cinder dumping ground. 74. In Ciepła St., the valley near the Sygnał allotment gardens, near the road; the dusty-sandy substratum with a highly humous surface.

20. Association *Impatiens-Convulvuletum* (Table 5, rec. 75)

The association is characterized by the absolute domination of *Impatiens glandulifera* over the other plant species occurring in it. *Cannabis sativa* ssp. *sativa* var. *spontanea* was recorded only as several specimens. Only one station of this association was recorded on a fertile, dusty-sandy humous alluvial soil.

Phytosociological record: 75. Hajdów, the Bystrzyca valley, near Łagiewnicka St., the fringe of riverside bush near a hay-growing meadow; a highly littered, dusty-sandy humous alluvial soil.

21. Association *Chelidonio-Robinetum* (Table 5, rec. 76-77)

In this association two subordinate floristic forms are distinctly marked, tentatively labelled as variants. One variant is characterized by an exceptionally high density of *Chelidonium majus* with a fairly abundant co-participation of growing trees *Acer negundo* and *Salix rosmarinifolia*. It is also marked by the exclusive though not very large presence of *Cannabis sativa* var. *spontanea*. The other variant is mainly distinguished for the domination of the planted shrubby, arborescent specimens of *Robinia pseudacacia* with a comparatively high co-participation of several herbaceous plant species, chiefly *Ballota nigra* and *Agropyron repens*. *Cannabis sativa* ssp. *sativa* var. *sativa* grows exclusively but not in great numbers in this variant. This is one of more rare phytocenosis forms characterized by the presence of *Cannabis sativa*. It was recorded mainly in habitats lying on loess and highly overshadowed by tree crowns.

Phytosociological records: 76. In Nadbystrzycka St., the upper part of a slumping, tree-covered loess slope of the Bystrzyca valley. 77. In Orzechowa St., near its exit towards Dożynkowa St., beside a field road near an astatic tank; the loess substratum with a littered surface, overshadowed by the *Robinia pseudacacia* upgrowth.

DISCUSSION OF RESULTS

It is practically impossible to exactly establish when first stations of the genus *Cannabis* taxa, grown or run wild, appeared in the city of Lublin. The earliest herbarium specimens of the genus *Cannabis* species, collected within the present-day city limits, come from the late 1950s (LBL leg. D. Fijałkowski). Data from the literature on hemp occurrence as species *Cannabis ruderalis* and *Cannabis sativa* in specific synanthropic phytocenoses in Lublin refer to the 1970s (7) and the last years of this decade (29). A detailed, complementary inventory of the stations of this plant comes from 1996-1998.

On the basis of the data collected so far about the *Cannabis sativa* stations in the city of Lublin, it is possible only to ascertain that it has grown in this town as a common plant, single or in a mass, since the time after World War II. This applies to the subspecies *Cannabis sativa* ssp. *sativa* formed in two varieties: *sativa* and *spontanea*. The successively spreading hemp stations presumably come from hemp specimens grown in gardens, allotment gardens and in cultivated fields since the early 19th century.

The currently largest concentration of stations of these plants within the Lublin city limits is marked in its central-northern part, mainly in the area of the Bystrzyca river valley and its tributaries (Fig. 1). They grow there equally often in ruderal and segetal stations. They occur most frequently in fertile anthropogenic habitats formed on the substratum of loess and sandy-gravel boulder clay and on

dusty-sandy humous alluvial soils. Hemp run wild often grows also on the fringes of neglected ploughfields, gardens, allotment gardens and city parks. Less often its specimens were recorded in ruderal loamy-rubble waste banks and the rims of waste heaps and compost or farmyard manure piles. Almost equally often they are found on the substratum that is permanently or intermittently moistened to a different degree or over-desiccated.

The soils in phytocenoses with *Cannabis sativa* (Table 1) do not significantly differ for their chemical properties from the soils studied in other ruderal phytocenoses, especially those characterized by the occurrence of e.g. *Iva xanthiifolia* (29). They are mostly anthropogenic soil covers, poorly saline, with alkaline pH and with a comparatively low content of Ca compounds. Only in the case of soils in the phytocenoses with *Cannabis sativa* specimens present, the comparatively high humus content is worth noting. Besides, with regard to the concentrations of other chemical compounds, like K, P, Mg, they are generally highly diversified (Table 1).

The frequency of *Cannabis sativa* occurrence in Lublin, in all earlier and now described synanthropic phytocenoses with its presence, is as follows: hemp as var. *spontanea* was recorded in the stations of 123 phytosociological records within 17 associations and 10 phytosociologically indeterminate synanthropic communities.

In the 1970s, according to Fijałkowski (7), hemp specimens, defined as species *Cannabis ruderalis*, were found in nine phytocenoses in the stations of 21 phytosociological records, currently with partly unconfirmed or re-confirmed occurrence. In the present investigation the occurrence of hemp was currently again not confirmed in the following six published associations (7): *Chenopodietum glauco-rubri* (Table 2, rec. 54, 56, 61), *Sisymbrietum sophiae* (Table 2, rec. 73, 74), *Artemisietum annuae* (Table 3, rec. 127), *Onopordetum acanthii* (Table 3, rec. 106), *Lycietum halimifolii* (Table 4, rec. 145-148) and *Helianthetum tuberosi* (Table 3, rec. 135, 136). On the other hand, hemp presence was re-confirmed in four phytocenoses published earlier, including three associations: *Chenopodietum ruderales* (Table 2, rec. 66) and *Leonuro-Arcietum tomentosum* (Table 3, rec. 117, 119) and in one community – with *Cannabis ruderalis* (Table 3, rec. 130-134).

Apparently, the average number of cases of hemp occurrence in specific synanthropic phytocenoses in the city of Lublin is highly diversified. Hemp in var. *spontanea* was most frequently recorded in the following six phytocenoses, including one association of *Chenopodietum ruderales* (Fijałkowski 1967, Table 2, rec. 66; Święś 1993, Table 3, rec. 16, 23-26, 30-33; the herein appended Table 2, rec. 9-17) and three communities – with *Cannabis sativa* (Fijałkowski 1967, Table 3, rec. 130-134, the herein appended Table 3, rec. 21-29); with *Urtica dioica* (the herein appended Table 4, rec. 53-63) and with *Iva xanthiifolia* (Święś 1993, Table 4, rec. 38, 48, 49, 53, 55, 57; the herein appended Table 3, rec. 32-34). The plant grows less often in two associations: *Atriplicetum nitentis* (Święś 1993, Table 2, rec. 7, 8,

10; the appended Table 3, rec. 38-41) and *Tanaceto-Artemisietum* (Świąg 1993, Table 5, rec. 59, 60, 63, 65, 66; the herein appended Table 4, rec. 49-520. With other phytocenoses, hemp in var., *spontanea* was recorded in one or two phytosociological records (Table 2-5, rec. 1, 2, 3, 8, 42-48, 70, 75, 76). This applies to five associations (*Polygono-Matricarietum discoideae*, *Erigeronto-Lactucetum*, *Echio-Melilotetum*, *Impatienti-Convolvuletum* and *Chelidonio-Robinetum*) and to six indeterminate communities (with *Phragmites australis*, with *Atriplex patula*, with *Conyza canadensis*, with *Cirsium arvense*, with *Bromus inermis* and with *Lamium album*).

The occurrence of hemp in var. *sativa*, however, was recorded only in five single phytosociological records belonging to five separate phytocenoses, including: two associations – *Leonuro-Arctietum tomentosum* and *Chelidonio-Robinetum*, and three indeterminate communities – with *Iva xanthiifolia*, with *Cannabis ruderalis* and with *Ballota nigra* (Table 3 and 5, rec. 30, 31, 64, 74, 77).

Moreover, the presence of hemp outside its stations of phytosociological records was discovered in 58 stations, of which: in var. *spontanea* in 47 and in var. *sativa* in 11 stations (Fig. 1).

It must be noted that in other towns in Poland the ratio of the recorded stations of hemp in var. *sativa* and *spontanea* is entirely the reverse of what was found in the city of Lublin. For the sake of illustration, the frequencies of occurrence of the two specific hemp varieties in Poznań, Kraków and Warsaw can be compared (14, 28, 30).

For two years in Lublin, an intensive police operation has been going on aimed at entirely uprooting hemp as a plant used for the illicit production of drug brew. As a result of the action of the systematic uprooting of self-seeding hemp stations, only a very small number was accidentally left out of the former numerous station of the plant. Most often these are sparse, single preserved specimens of this plant, very rarely there are larger dense expanses (Fig. 4, 5). Under such circumstances, the stations of *Cannabis sativa* specimens run wild in the city of Lublin will be entirely uprooted in the near future.

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STRESZCZENIE

W opracowaniu przedstawiono stan aktualnego występowania konopi (*Cannabis* L.) na siedliskach ruderalnych na terenie miasta Lublina. Wzięto tu pod uwagę przede wszystkim obecność konopi w określonych zbiorowiskach synantropijnych, scharakteryzowanych pod względem struktury fitosocjologicznej i ekologicznej. Uwzględniono również stanowiska i warunki siedliskowe konopi występujących na stanowiskach poza zwałami zbiorowiskami roślin. Dane o występowaniu konopi na terenie Lublina oparto na wszystkich na ten temat zgromadzonych materiałach z literatury, z zielników oraz dodatkowych, uzupełniających badań terenowych nad występowaniem tych roślin.

Konopie należą do najstarszych roślin uprawianych w różnych częściach świata. Ich przodkowie pochodzą prawdopodobnie z obszaru Morza Kaspijskiego. Pierwsze ich uprawy znane są z Chin (XXVIII w. p.n.e.) i Indii (VII-IX w. p.n.e.). W Europie pierwsze znane uprawy konopi datują się na okres neolitu śląskiego. W obecnych granicach Polski ślady występowania konopi na stanowiskach synantropijnych znane są za okresu wczesnego średniowiecza.

Konopie uchodzą za rośliny siedlisk żyznych o korzystnych warunkach wilgotnościowych i świetlnych. Najdogodniejsze warunki do rozwoju mają na glebach aluwialnych, czarnoziemnych, brunatnych i rędziny. Ze stanowisk uprawianych z łatwością rozprzestrzeniają się i dziczeją na różnych rodzajach siedlisk antropogenicznych, zarówno typu segetalnego, jak i ruderalnego.

Konopie w uprawie i na stanowiskach ruderalnych w różnych strefach geograficznych, z łatwością przystosowują się do panujących warunków klimatycznych, wykazując przy tym dużą zmienność form ekotypowych.

Rodzaj *Cannabis* L. reprezentowany jest przez jeden gatunek – *Cannabis sativa* L., uformowany w dwu podgatunkach: *indica* (Lam.) Small et Grong i *sativa* L. Pierwszy z tych podgatunków występuje w południowej Azji, w Afryce oraz w Ameryce Południowej i Środkowej. Drugi zdomował się na dużych obszarach Europy, Ameryki Północnej i północnej części Azji.

Na obszarze Polski gatunek *Cannabis sativa* L. uformowany jest tylko w podgatunku *sativa* w dwu odmianach: *sativa* i *spontanea* Vavilov. Trzecia wyodrębniona mieszańcowa odmiana wymienionego podgatunku konopi – var. *intersita* Sojak – na obszarze Polski nie była dotąd notowana. Na terenie Lublina występują one w odmianach: *spontanea* i *sativa*.

Okazuje się, że niemożliwe jest jakiegokolwiek bliższe określenie czasu pojawienia się pierwszych stanowisk dziczałych okazów konopi na terenie Lublina. Przypuszczalnie sukcesywnie rozprzestrzeniające się ruderalne stanowiska konopi wywodzą się z ich okazów hodowanych w ogródkach i na polach uprawnych prawdopodobnie od początku XIX wieku.

Aktualnie na terenie Lublina największe zagęszczenie stanowisk „dziczałych” konopi zaznacza się w najstarszej środkowo-północnej jego części, głównie w rejonie doliny rzeki Bystrzycy i jej dopływów. Najczęściej występują one tam na miedzach polnych, skraju zaniedbanych pól uprawnych, ogrodów, ogródków działkowych i parków miejskich. Są to stanowiska dziczałych konopi, nieco częściej typu ruderalnego niż segetalnego. Występują one najczęściej na żyznych antropogenicznych miejscach na podłożu lessowym, glin zwałowych, na próchnicznych madach pylasto-piaszczystych oraz na starych zypiskach gliniasto-gruzowiskowych i zwirowo-pylasto-piaszczystych. Spotyka się je również na siedliskach silnie nawożonych, głównie na obszarze śmietnisk, składowisk kompostu i obornika. Zbadane gleby w zbiorowiskach cechujących się

obecnością konopi, pod względem właściwości chemicznych niczym zbytnio nie różnią się od gleb zbadanych w innych zbiorowiskach ruderalnych (tab. 1). W glebach, na których rosną konopie, zwraca uwagę tylko to, że są one najczęściej silnie zasobne w próchnicę (tab. 1).

Na terenie Lublina konopie w podgatunku *Cannabis sativa* ssp. *sativa* występują w dwu odmianach: *sativa* i *spontanea*. Rośliny te w odmianie *spontanea* w sumie notowane były na stanowiskach 123 zdjęć fitosocjologicznych reprezentujących 17 zespołów i 10 bliżej fitosocjologicznie nie określonych zbiorowisk. W wymienionej odmianie *spontanea* najczęściej notowano je w jednym zespole (*Chenopodietum ruderales*) oraz w trzech zbiorowiskach (z *Cannabis ruderalis*, z *Urtica dioica* i z *Iva xanthiifolia*). Nieco rzadziej występują one w zespołach: *Atriplicetum nitentis* i *Tanaceto-Artemisietum*. Natomiast w 11 innych fitocenozach Lublina konopie w odmianie *spontanea* notowane były tylko w jednym do dwu zdjęciach fitosocjologicznych. Odnosi się to do pięciu zespołów (*Polygono-Matricarietum discoideae*, *Erigeronto-Lactucetum*, *Echio-Melilotetum*, *Impatiенти-Convolvuletum* i *Chelidonio-Robiniatum*) oraz do sześciu bliżej nie określonych, fragmentarycznie uformowanych zbiorowisk (z *Phragmites australis*, z *Atriplex patula*, z *Coryza canadensis*, z *Cirsium arvense*, z *Bromus inermis* i z *Lamium album*). Ponadto konopie w odmianie *spontanea* zanotowano na 45 stanowiskach zlokalizowanych poza zwartymi zbiorowiskami ruderalnymi (ryc. 1).

Na terenie Lublina, w porównaniu z innymi miastami w Polsce, zwraca uwagę bardzo niewielka liczba stanowisk konopi rosnących w odmianie *sativa*. Obecność konopi w tej odmianie zlokalizowano zaledwie w pięciu zdjęciach fitosocjologicznych reprezentujących zarazem pięć odrębnych fitocenz, w tym: dwu zespołów (*Leonuro-Arctietum tomentosum* i *Chelidonio-Robiniatum*) oraz trzech zbiorowisk (z *Iva xanthiifolia*, z *Cannabis ruderalis* i z *Ballota nigra*). Poza stanowiskami zwartych zbiorowisk roślin wymienioną odmianę konopi zlokalizowano tylko na 10 stanowiskach (ryc. 1).

Na terenie Lublina w latach siedemdziesiątych obecność konopi, uznawanych wówczas za odrębny gatunek – *Cannabis ruderalis* – notowana była na stanowiskach 21 zdjęć fitosocjologicznych, reprezentujących dziesięć odrębnych fitocenz. W tej sytuacji na uwagę zasługuje fakt, że aktualnie nie potwierdzono obecności konopi w sześciu fitocenozach opublikowanych z lat siedemdziesiątych. Odnosi się to do następujących zespołów: *Chenopodio glauco-rubri*, *Sisymbrietum sophiae*, *Artemisietum annuae*, *Onopordetum acanthii*, *Lycietum halimifolii* i *Helianthetum tuberosi*.

Na terenie Lublina od dwu lat trwa intensywna policyjna akcja doszczętnego wytępienia ruderalnych stanowisk konopi, z uwagi na to, że mogą one być wykorzystane do nielegalnej produkcji narkotyku. W tej sytuacji licznym stanowiskom zdziczałych okazów konopi na terenie Lublina grozi w niedalekiej przyszłości całkowita zagłada.