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MEDICINAL PLANTS IN SEGETAL COMMUNITIES OF THE KAŁUSZYŃSKA UPLAND

ABSTRACT

The herbal flora of agrocenoses of the Kałuszyńska Upland includes 137 vascular plant species. Apophytes (91 species – 66,4%) prevail over anthropophytes (46 species – 33,6 %). Meadow (32 species), waterside (20 species) and forest apophytes (17 species) were the most numerous. Short-lived plants (71 species) prevail over perennials (66 species) in the analysed flora. Therophytes (65 species) and hemicryptophytes (48 species) were the dominant life forms. Very rare, rare and quite rare species were the most frequent in the flora of the Kałuszyńska Upland. They build up over 63% of the total number of species. The share of common and very common species was about 8%. Some of them, e.g. *Equisetum arvense*, *Chenopodium album*, *Viola arvensis*, *Anthemis arvensis*, *Centaurea cyanus*, *Cirsium arvense*, *Elymus repens*, *Convolvulus arvensis*, *Capsella bursa-pastoris* and *Stellaria media* were noted with a high ground cover. The occurrence of species rare in the region and in Poland among recorded medicinal plants, e.g., *Camelina microcarpa* sp. *sylvestris*, *Hypericum humifusum*, *Consolida regalis*, *Asperugo procumbens* and *Herniaria glabra* is especially noteworthy.

Key words: herbs, resources, segetal flora, Kałuszyn Upland

INTRODUCTION

Weeds are usually considered to be competitors of cultivated plants, diminishing quantity and quality of yield. In fact, only few species would pose a serious threat to cultivated plants. Recently, a positive aspects of their occurrence have been emphasized, e.g. their biocenotic role and possibility of practical use. A large number of weeds show therapeutic properties (Skrzyczyńska, Affek-Starczewska 2000). Usage of herbicides on a large scale has significantly reduced their occurrence in agrocenoses (Warcholińska 1998). These, which were able to survive in a environment contaminated by pesticides residues used to diminish their therapeutic properties. Herbs are widely applied in farming practice. They are used as protection plants, some of them also provide an invaluable resource for pesticides against diseases and pests. A skilful usage of herbs is an im-

portant element of organic farming. A little share of herbaceous plants in agrocenoses favourably affect the yield (Trzcińska-Tacik 2000). Nowadays, in Poland, about 20 % of herbal resources come from natural communities, whereas 80% from cultivation (Antkowiak 1998).

The aim of the paper was presentation of the floristic composition of medicinal weed species occurring in the agrocenoses of the Kałuszyńska Upland. The analysis includes the affiliation of the plants to geographic-historical groups, persistence and frequency of species, and the biological type according to Raunkiær.

The Kałuszyńska Upland is a typical agricultural region with domination of small-area family farms, characterized by low intensity. A large field fragmentation and wide contact of cultivated areas with seminatural and natural communities is typical for this region. The studied area is located in the central-eastern part of Masovia Province and in the southern part of Południowopodlaska Lowland mesoregion (Kondracki 2000).

MATERIAL AND METHODS

Phytosociological studies in agrocenoses of the Kałuszyńska Upland were carried out between 1994 and 1998 in the area of 103 localities. In total, 840 phytosociological relevés were made in cereal and root crops and in stubble fields. Medicinal plants were selected from the list of segetal flora of the mesoregion (Skrzyczyńska, Skrajna 1999) on the basis of works by Broda, Mowszowicz (2000) and Farmakopea Polska (1970). In the summary table (tab 1) medicinal weed species are listed according to botanical genera and their characteristics are described. Systematic arrangement of species was given after Rutkowski (2007), nomenclature of species and families according to Mirek *et al.* (2002). A classification of species, including their persistence, origin and biological type was based on the papers by: Kornaś (1977), Sowa, Warcholińska (1987), Korniak (1992), Zając (1997). Occurrence frequency of taxa was given according to conventional scale (number of stands = number of localities): very rare: 1 – 2 localities, rare: 3 – 8 localities, quite rare: 9 – 20 localities, frequent: 21 – 40 localities, quite frequent: 41 – 60 localities, common: 61 – 80 localities, very common: 81 – 103 localities. Species coverage was recorded as follows: 1 – very little (single specimens), 2 – little (up to 5%), 3 – medium (6 – 20%), 4 – high (21 – 40%).

RESULTS AND DISCUSSION

The segetal flora of Kałuszyńska Upland includes 278 vascular plant species, of which almost one-half (137 taxa) possesses medicinal properties. It is as rich as medicinal flora of agrocenoses of the Siedlecka Upland (137 species) (Skrzyczyńska Affek-Starczewska 2000) and much poorer than herbal vegetation of cultivated fields of the Podlaski Przełom Bugu mesoregion (176 taxa) (Rzy-

Table 1

List of species

Species	Geographic-historical group	Persistence	Life-form	Frequency of the occurrence	Mean cover
1	2	3	4	5	6
Equisetaceae					
1. <i>Equisetum arvense</i> L.	Al	W	G	very common	4
Urticaceae					
2. <i>Urtica urens</i> L.	Ar	K	T	quite rare	1
3. <i>U. dioica</i> L.	Al	W	G (H)	rare	1
Polygonaceae					
4. <i>Rumex obtusifolius</i> L.	Al	W	G	quite rare	1
5. <i>R. crispus</i> L.	Al(nw)	W	G	quite common	1
6. <i>R. acetosa</i> L.	Al	W	H	frequent	1
7. <i>Polygonum amphibium</i> L.	Anw	W	G	rare	1
8. <i>P. persicaria</i> L.	Anw	K	T	common	3
9. <i>P. hydropiper</i> L.	Anw	K	T	common	2
10. <i>P. aviculare</i> L.	Anw	K	T	common	2
Chenopodiaceae					
11. <i>Chenopodium album</i> L.	Anw	K	T	very common	4
12. <i>Ch. rubrum</i> L.	Anw	K	T	rare	1
13. <i>Atriplex patula</i> L.	Ar	K	T	quite rare	1
Caryophyllaceae					
14. <i>Gypsophila muralis</i> L.	Anw	K	T	common	2
15. <i>Saponaria officinalis</i> L.	Anw	W	G (H)	very rare	1
16. <i>Melandrium album</i> /Mill./ Garcke	Al	K	T	quite common	2
17. <i>Silene vulgaris</i> /Moench/Garcke	Amk	W	H	quite rare	2
18. <i>Agrostemma githago</i> L.	Ar	K	T	quite rare	1
19. <i>Stellaria media</i> /L./ Vill.	Al (l)	K	T	very common	3
20. <i>Cerastium arvense</i> L.	Aps	W	H(Ch)	frequent	1
21. <i>Spergularia rubra</i> /L./J. Presl et C. Presl	Anw	K	T	common	2
22. <i>Herniaria glabra</i> L.	Aps	K	T	very rare	1
Euphorbiaceae					
23. <i>Euphorbia peplus</i> L.	Ar	K	T	rare	1
24. <i>E. cyparissias</i> L.	Amk	W	G (H)	very rare	1
Ranunculaceae					
25. <i>Consolida regalis</i> S. F. Gray	Ar	K	T	quite rare	3
26. <i>Ranunculus flammula</i> L.	Anw	W	H	very rare	1
27. <i>R. acris</i> L.	Al	W	H	very rare	1
28. <i>Ficaria verna</i> Huds.	Al	W	H	very rare	1
Papaveraceae					
29. <i>Papaver argemone</i> L.	Ar	K	T	frequent	3
30. <i>P. dubium</i> L.	Ar	K	T	rare	1
31. <i>P. rhoeas</i> L.	Ar	K	T	rare	2
32. <i>Fumaria officinalis</i> L.	Ar	K	T	frequent	2

Table 1

Continued						
1	2	3	4	5	6	
Brassicaceae						
33.	<i>Cardamine pratensis</i> L.	Al	W	G	very rare	1
34.	<i>Sisymbrium officinale</i> /L./ Scop.	Ar	K	T	quite rare	1
35.	<i>Descurainia sophia</i> /L./ Webb. ex Prantl	Ar	K	T	frequent	1
36.	<i>Erysimum cheiranthoides</i> L.	Ar	K	T	frequent	2
37.	<i>Sinapis arvensis</i> L.	Ar	K	T	frequent	2
38.	<i>S. alba</i> L.	Er	K	T	quite rare	1
39.	<i>Berteroa incana</i> /L./ DC	Amk	K	T	very rare	1
40.	<i>Armoracia rusticana</i> P.Gaertn.,B.Mey.et Scherb.	Ar	W	G	quite rare	1
41.	<i>Camelina microcarpa</i> sp. <i>sylvestris</i> (Wallr.) Hutonen	Ar	K	T	rare	1
42.	<i>Thlaspi arvense</i> L.	Ar	K	T	frequent	2
43.	<i>Lepidium ruderale</i> L.	Ar	K	T	very rare	1
44.	<i>Capsella bursa-pastoris</i> /L./ Medik.	Ar	K	T	very common	3
Violaceae						
45.	<i>Viola tricolor</i> L.	Aps	K	T	very rare	1
46.	<i>V. arvensis</i> Murray	Ar	K	T	very common	4
Clustaceae						
47.	<i>Hypericum humifusum</i> L.	Aps	W	T (H)	quite common	3
48.	<i>H. perforatum</i> L.	Al	W	H	quite rare	1
Crassulaceae						
49.	<i>Sedum maximum</i> /L./ Hoffm.	Amk	W	G	rare	1
50.	<i>S. acre</i> L.	Amk	W	H	very rare	1
Rosaceae						
51.	<i>Rubus caesius</i> L.	Al	W	Ch	rare	1
52.	<i>Potentilla argentea</i> L.	Amk	W	H	rare	1
53.	<i>P. erecta</i> /L./ Rausch.	Al	W	H	very rare	1
54.	<i>P. anserina</i> L.	Al	W	H	quite common	3
Fabaceae						
55.	<i>Melilotus officinalis</i> /L./ Pall.	Al(nw)	K	T	very rare	1
56.	<i>Trifolium arvense</i> L.	Aps	K	T	frequent	2
57.	<i>T. repens</i> L.	Al	W	H	common	2
58.	<i>T. pratense</i> L.	Al	K	T	rare	1
59.	<i>Vicia cracca</i> L.	Al	W	H	rare	1
60.	<i>Lathyrus pratensis</i> L.	Al	W	H	rare	1
Onagraceae						
61.	<i>Oenothera biennis</i> L.	Aps	K	T	very rare	1
Malvaceae						
62.	<i>Malva neglecta</i> Wallr.	Ar	K	T	quite rare	1
63.	<i>M. pusilla</i> Sm.	Ar	K	H	very rare	1
Geraniaceae						
64.	<i>Geranium pratense</i> L.	Al	W	H	very rare	1
65.	<i>Erodium cicutarium</i> /L./ L.	Ar	K	T (H)	common	3
Apiaceae						
66.	<i>Carum carvi</i> L.	Al	K	T	very rare	1

Table 1

Continued						
1	2	3	4	5	6	
67.	<i>Aegopodium podagraria</i> L.	Amk	W	H	very rare	1
68.	<i>Pimpinella saxifraga</i> L.	Amk	W	H	quite rare	1
69.	<i>Daucus carota</i> L.	Ar	K	T	frequent	1
Primulaceae						
70.	<i>Anagallis arvensis</i> L.	Ar	K	T	quite common	3
71.	<i>Lysimachia nummularia</i> L.	Al	W	G	quite rare	2
72.	<i>L. vulgaris</i> L.	Al	W	G (H)	rare	1
Convolvulaceae						
73.	<i>Convolvulus arvensis</i> L.	Amk	W	G	very common	3
74.	<i>Cuscuta trifolii</i> Bob. & Gibson	Ar	K	T	very rare	1
Boraginaceae						
75.	<i>Anchusa officinalis</i> L.	Amk	K	H	rare	1
76.	<i>Symphytum officinale</i> L.	Anw(I)	W	G	frequent	1
77.	<i>Echium vulgare</i> L.	Amk	K	H	quite rare	1
78.	<i>Lithospermum arvense</i> L.	Ar	K	T	frequent	3
79.	<i>Myosotis palustris</i> /L./ L.em. Rchb.	Anw	W	H	very rare	1
80.	<i>Asperugo procumbens</i> L.	Ep	K	T	very rare	1
Solanaceae						
81.	<i>Solanum nigrum</i> L.em. Mill.	Ar	K	T	quite rare	2
82.	<i>Datura stramonium</i> L.	Ep	K	T	very rare	1
Scrophulariaceae						
83.	<i>Verbascum thapsus</i> L.	Amk	K	H	very rare	1
84.	<i>Linaria vulgaris</i> Mill.	Aps	W	G	rare	1
85.	<i>Veronica chamaedrys</i> L.	Al	W	H	rare	1
86.	<i>Rhinanthus serotinus</i> /Schönh./ Oborný	Ar	K	T	very common	3
Lamiaceae						
87.	<i>Glechoma hederacea</i> L.	Al	W	H	very rare	2
88.	<i>Prunella vulgaris</i> L.	Al	W	H	rare	1
89.	<i>Galeopsis ladamum</i> L.	Ar	K	T	quite common	2
90.	<i>G. tetrahit</i> L.	Al	K	T	common	3
91.	<i>G. speciosa</i> Mill.	Al	K	T	frequent	1
92.	<i>Lamium album</i> L.	Ar	W	T	very rare	1
93.	<i>Thymus serpyllum</i> L.M. Fr.	Aps	W	H	very rare	1
94.	<i>Lycopus europaeus</i> L.	Anw	W	H	very rare	1
95.	<i>Mentha arvensis</i> L.	Anw	W	G	very common	3
Plantaginaceae						
96.	<i>Plantago major</i> L.	Al	W	H	quite common	1
97.	<i>P. intermedia</i> Gilib.	Anw	W	H	common	3
98.	<i>P. media</i> L.	Al	W	H	rare	1
99.	<i>P. lanceolata</i> L.	Al	W	H	quite common	1
Gentianaceae						
100.	<i>Centaurium pulchellum</i> (Sw.) Druce	Al	K	T	rare	1
Rubiaceae						
101.	<i>Galium mollugo</i> L.	Al	W	G	very rare	1

Table 1

Continued						
1	2	3	4	5	6	
102.	<i>G. aparine</i> L.	Al	K	T	quite common	3
Dipsacaceae						
103.	<i>Knautia arvensis</i> /L./ J.M. Coult.	Al	W	H	quite common	1
Asteraceae						
104.	<i>Solidago virgaurea</i> L.	Al	W	H	very rare	1
105.	<i>S. canadensis</i> L.	Ep	W	H	very rare	1
106.	<i>Bellis perennis</i> L.	Al	W	H	very rare	1
107.	<i>Coryza canadensis</i> /L./ Cronquist	Ep	K	T	frequent	3
108.	<i>Gnaphalium uliginosum</i> L.	Anw	K	T	common	4
109.	<i>Bidens tripartita</i> L.	Anw	K	T	common	3
110.	<i>Galinsoga parviflora</i> Cav.	Ep	K	T	common	4
111.	<i>G. ciliata</i> /Raf./S.F. Blake	Ep	K	T	quite common	3
112.	<i>Anthemis arvensis</i> L.	Ar	K	T	very common	4
113.	<i>A. Achille millefolium</i> L.	Al	W	H	very common	1
114.	<i>Chamomilla recutita</i> /L./ Rauschert	Ar	K	T	rare	1
115.	<i>Ch. suaveolens</i> /Pursh/ Rydb.	Ep	K	T	frequent	1
116.	<i>Tanacetum vulgare</i> L.	Al(nw)	W	H	quite rare	2
117.	<i>Artemisia absinthium</i> L.	Ar	W	H	quite rare	1
118.	<i>A. vulgaris</i> L.	Al(nw)	W	H	common	2
119.	<i>A. campestris</i> L.	Aps	W	H	quite rare	1
120.	<i>Tussilago farfara</i> L.	Anw	W	G	quite rare	2
121.	<i>Senecio vulgaris</i> L.	Ar	K	T (H)	quite rare	1
122.	<i>Arctium tomentosum</i> Mill.	Al	K	H	very rare	1
123.	<i>A. lappa</i> L.	Al	K	H	rare	1
124.	<i>A. minus</i> /Hill/ Bering.	Az	K	H	very rare	1
125.	<i>Cirsium arvense</i> /L./ Scop.	Al	W	G	very common	4
126.	<i>Centaurea cyanus</i> L.	Ar	K	T	very common	4
127.	<i>C. jacea</i> L.	Al	W	H	very rare	1
128.	<i>Cichorium intybus</i> L.	Ar	W	G	quite rare	1
129.	<i>Lapsana communis</i> L.	Al	K	T (H)	frequent	3
130.	<i>Taraxacum officinale</i> F.H. Wigg.	Al	W	H	common	2
131.	<i>Sonchus oleraceus</i> L.	Ar	K	T (H)	frequent	2
132.	<i>Lactuca serriola</i> L.	Ar	K	H	very rare	1
133.	<i>Hieracium pilosella</i> L.	Aps	W	H	quite rare	1
Poaceae						
134.	<i>Anthoxanthum odoratum</i> L.	Al	W	G	quite rare	2
135.	<i>Phragmites australis</i> /Cav./ Trin. Ex Steud.	Anw	W	G	quite rare	1
136.	<i>Dactylis glomerata</i> L.	Al	W	H	rare	1
137.	<i>Elymus repens</i> /L./ P. Beauv.	Anw	W	G	very common	4

Explanations: column 1 – name of species; column 2 – geographic-historical group; Ar - archaeophytes, Ep - epeophytes, Er - ergasiophytes; A - apophytes, l – meadows, nw – waterside and wet habitats; ps - psammophilous grasslands and sand dunes; l - forest and shrub habitats; mk – xerothermic grasslands; column 3 – persistence; K – short-lived taxa; W – perennial taxa; column 4 – life-form; T – therophytes, H – hemicyptophytes, G – geophytes, Ch – chamephytes; column 5 – occurrence frequency; column 6 – mean cover.

mowska Skrzyczyńska 2003). Such factors, as, a large diversity of habitat conditions and mosaic of cultivated fields, meadows, mid-field afforestations in the agricultural landscape affect its biodiversity. Therefore most of the herbaceous plants recorded in the studied agrocenoses belong to the group of native species – apophytes (91 taxa – 66,4 %) (Table 1, Fig. 1). Among them, meadow (32 species), waterside (20 species) as well as forest and shrub plans (17 species) were the most numerous. Xerothermic (12 species) and psammophilous apophytes (10 species) were also frequently noted (Fig. 2.).

Herb flora

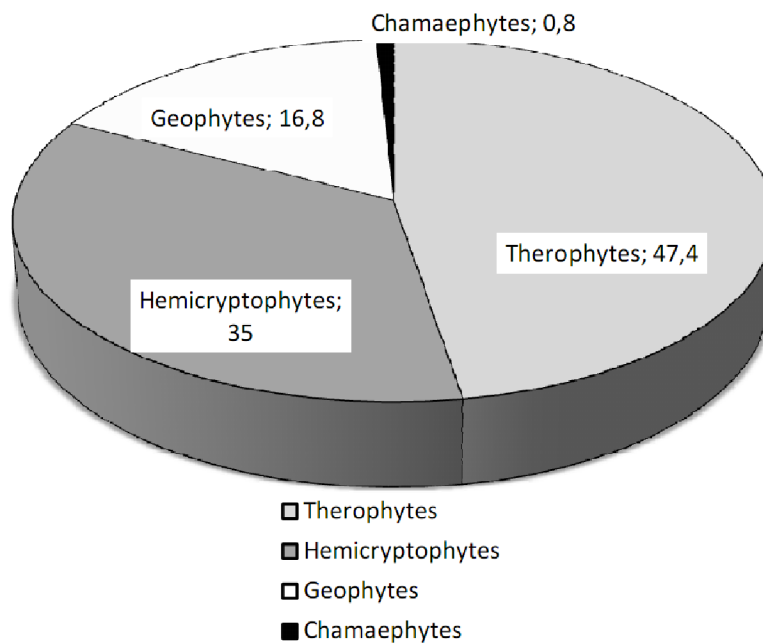


Fig 1. Participation of geographic-historical group in the herb flora on the Kałuszyńska Upland

- In total, 46 anthropophytes were recorded in the studied flora (33.6 %). Archaeophytes (36 species – 78.3%) prevail over epecophytes (7 species – 15,2%) and ergasiophygophytes (1 species – 2.2%).

- Analysis of persistence of species indicated a little domination of short-lived species (71 taxa – 51.8) over perennials (66 – 48.2). Therophytes (65 species – 47,4%) and hemicryptophytes (48 species – 35%) are the most frequent life forms in the herbaceous segetal flora of the Kałuszyńska Upland. Moreover 23 species of geophytes were recorded (16.8%) and only 1 chamaephyt (0.8%) (Fig. 3).

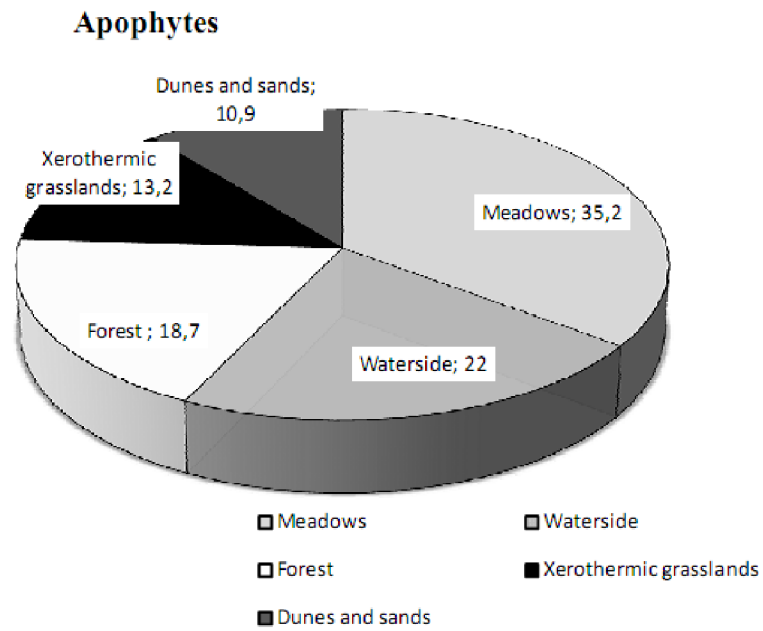


Fig. 2 Origin of apophytes in herb flora on the Katuszyńska Upland

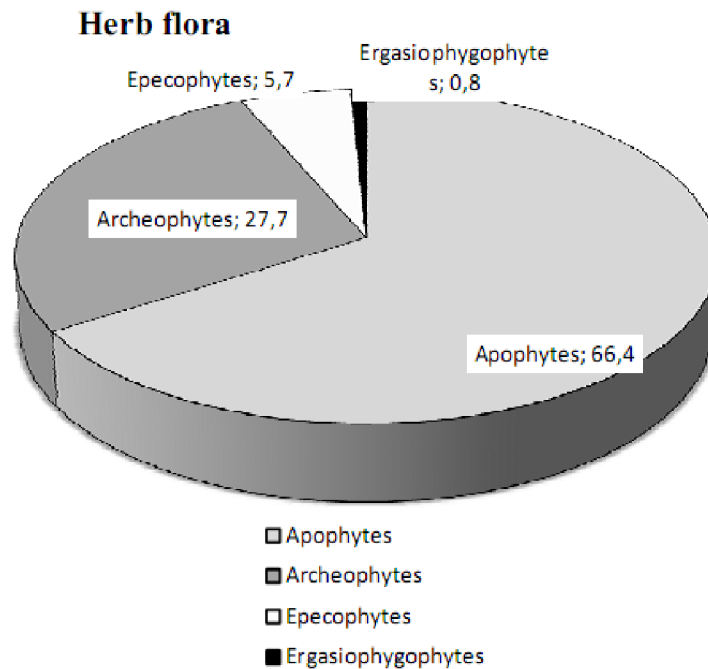


Fig.3 Participation of the different biological forms in the herb flora of the Katuszyńska Upland

- Herbaceous plants occurring in agrocenoses of the Kałuszyńska Upland were usually classified as very rare, rare and quite rare components of the studied flora (87 species – 63.5 %). They usually occur at low ground cover, e.g., *Chamomilla recutita*, *Glechoma chederacea*, *Prunella vulgaris*, *Saponaria officinalis* *Lathyrus pratensis*. The only exception was *Consolida regalis*, occurring locally with a cover (3).

The more frequent segetal herbaceous species, as *Papaver argemone*, *Conyza canadensis*, *Rhinantus serotinus*, *Lapsana communis* and locally *Lithospermum arvense*, *Fumaria officinalis*, *Erysimum cheiranthoides* and *Sinapis arvensis* reached an average cover (3). The group of common and very common plants included 11 species (8%), of which *Equisetum arvense*, *Chenopodium album*, *Viola arvensis*, *Anthemis arvensis*, *Centaurea cyanus*, *Gnaphalium uliginosum*, *Galinsoga parviflora*, *Cirsium arvense* and *Elymus repens* reached the highest cover (4). A large cover of *Convolvulus arvensis*, *Capsella bursa-pastoris* and *Stellaria media* was also observed. Besides, such common and very common species as, *Plantago intermedia*, *Polygonum persicaria*, *Erodium cicutarium*, *Galeopsis tetrahit*, *Melandrium album*, *Galium aparine*, *Hypericum humifusum*, *Anagallis arvensis* reached cover (3), whereas *Achillea millefolium*, *Polygonum aviculare*, *Artemisia vulgaris* and *Taraxacum officinale* – had a mean cover (2).

Occurrence of species rare in the region and in Poland (Warcholińska 1994) among recorded medicinal plants as, *Camelina microcarpa* sp. *sylvestris*, *Hypericum humifusum*, *Consolida regalis*, *Asperugo procumbens* and *Herniaria glabra* is especially noteworthy.

CONCLUSIONS

1. A large number of medicinal weed species occurring at low cover indicates that the agrocenoses are not profitable place for herb gathering in the studied region.

2. Herb gathering in the fields can be profitable only with reference to a small group of common species, occurring with a high cover, as, *Equisetum arvense*, *Chenopodium album*, *Viola arvensis*, *Anthemis arvensis*, *Centaurea cyanus*, *Gnaphalium uliginosum*, *Galinsoga parviflora*, *Cirsium arvense*, *Elymus repens*, *Convolvulus arvensis*, *Capsella bursa-pastoris* and *Stellaria media*.

REFERENCES

- Antkowiak L., 1998: Medicinal plants. Wyd. AR Poznań : 4-217.
Broda B., Mowszowicz J., 2000: Guide to determination of medicinal, poisonous and usable plants. Wyd. Lekarskie PZWL, Warszawa.
Farmakopea Polska. IV, PZWL, Warszawa, 1970
Kondracki J. 2002. Climatic regions of Poland. Wyd. PWN. Warszawa: 201-204.
Kornaś J., 1977: Analysis of synantropic floras. Wiad. Bot., 21(2): 85-91.
Korniak T., 1992: Segetal flora of north-eastern Poland, its spatial differentiation and present-day transforma-

- tions. *Acta Acad. Agricult. Tech. Olst. Agricult., Suppl. A*, 53: 5-7.
- Mirek Z., Pieńkoś-Mirkowa H., Zajac M., 2002: Flowering plants and peridophytes of Poland a checklist. *Kraków*: 1-442.
- Rutkowski L., 2007: a guidebook for the identification of vascular plants of Polish lowlands. *Wyd. Nauk. PWP Warszawa*.
- Rzymowska Z., Skrzyczyńska., 2003: Medicinal plants in agrocenoses of the Podlaski Przełom Bugu mesoregion. *Pam. Puławski*, 134: 178-189.
- Skrzyczyńska, Affek-Starczewska 2000: Medicinal plant sof communities of the Siedlecka Upland segetal flora. *Fragm. Agron.*, XVII, 2(66): 8-99.
- Skrzyczyńska J., Skrajna T., 1999: The segetal flora of the Kałuszyn Upland. *ACTA Agrobot. Vol. 52, z.(1-2)*: 183-202.
- Sowa R., Warcholińska A.U.,1987: Synanthropic flora of Łowicz and Skierniewice. *Acta Univ. Lodz., Folia Bot.*, 5: 109-164.
- Trzcińska-Tacik H. 2000. Weed communities on cereal fields in the Skalbierz region. *Pam. Puławski*, 122: 59-75.
- Warcholińska A. U. 1994. List of threatened segetal plant species in Poland. (w:) Mochnecký, S., Terpó A. (Eds). *Antropization and environment of rural settlements. Flora and vegetation. Proceedings of International Conference. Sátoraljaújhely*: 206-219.
- Warcholińska A. U. 1998. Properties of threatened segetal vascular plants in Poland. *Acta Univ. Lodz., Folia Bot.* 13:7-14.
- Zajac A., 1979: The origin of the archaeophytes occurring in Poland. *Habitat. Thesis 29,UJ*: 5-213.