Roczniki Akademii Rolniczej w Poznaniu CCCLXXXVI

Botanika – Steciana

11, 2007, 53-56

www.au.poznan.pl/steciana

ISSN 1896-1908

PHYTOCENOSES WITH *HERACLEUM SOSNOWSKYI* MANDEN. IN CENTRAL POMERANIA

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(Received: June 4, 2007. Accepted: August 23, 2007)

ABSTRACT. The work presents the distribution of *Heracleum sosnowskyi* Manden. in eastern part of West Pomerania. There are five plant communities of that species in the mentioned area: *Urtico-Aegopodietum podagrariae* (Tx. 1963 n.n.) em. Dierschke 1974, *Anthriscetum sylvestris* Hadač 1978, *Phalarido-Petasitetum hybridii* Schwick. 1933, *Agropyro-Urticetum dioicae* Hadač 1978, moreover in a *Reynoutria sachalinensis* community.

KEY WORDS: *Heracleum sosnowskyi*, nitrophilous plant communities, Central Pomerania, ATPOL

INTRODUCTION

Heracleum sosnowskyi was described by Mandenova in 1944. Natural localities of this species occur in the Caucasus (Mandenova 1951).

It was brought to many experimental farms at different agricultural research stations in Poland at the beginning of the 1970s. The cultivation of this plant was aimed at determining and using its feeding values (Lutyńska 1980, Pasieka 1984). The results of the research on using *Heracleum sosnowskyi* occurred to be encouraging. It appeared to be wealthy with nutrients, so it was used to making silage or pickling other plants (Bochniarz M. and Bochniarz J. 1986). Thanks to those feeding values it was cultivated for trial in many places in Poland.

After all some difficulties occurred with making silage and feeding animals, because of harvesting large plants (there are shoots of about 1.0-1.5 m long in the Caucasus, but thanks to great conditions in Poland, *Heracleum sosnowskyi* is very often twice as high as in its homeland). The only solution was manual harvesting by sickles, scythes, parangs etc. The workers engaged in the process of cutting and transporting and making silage of the plants complained about skin irritation and also dangerous burns. It was probably caused by skin photosensitization after contact with the plant's sap containing furocoumarins (Korniak and Środa 1996, Markowa 2001). That is the reason why its cultivation was discontinued.

At present *H. sosnowskyi* still occurs in Poland, but as a wild species, mostly at places of its former cultivation and spreads for few kilometers from them. It seems to be very expansive, occurs in large numbers and changes phytocoenoses.

The aim of this work was to catalogue plant communities with *H. sosnowskyi* in Central Pomerania.

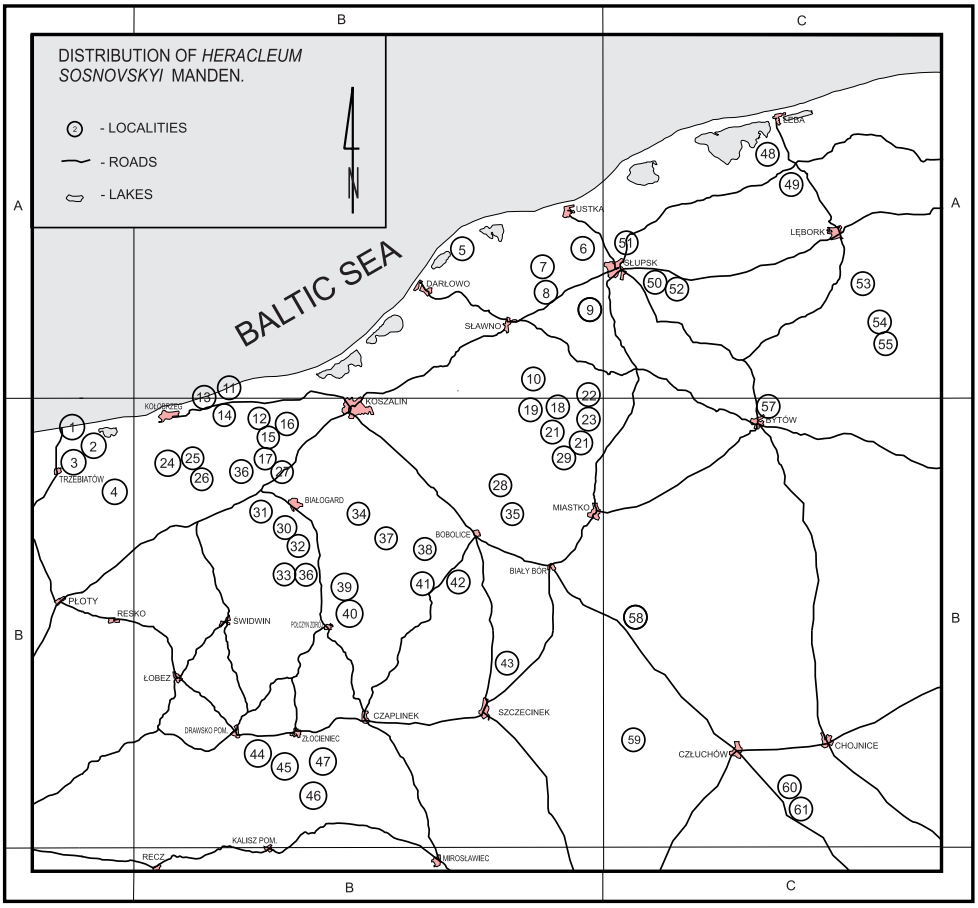
MATERIAL AND METHODS

The surveys about distribution of phytocenoses concerning *H. sosnowskyi* were carried out in Central Pomerania in the years 2000-2006. The author assumes the Central Pomerania is the area between Ice-marginal Valley of Łeba-Reda from east and the Parsęta river from west, whereas according to Kondracki (1998) Central Pomerania **is in fact just eastern part of West Pomerania.**

There were taken 72 phytosociological relevés by the Braun-Blanquet method (Pawłowski 1972). The classification and nomenclature of syntaxa was adopted after Matuszkiewicz (2001), nomenclature of vascular plants after Mirek et al. (2002).

Every locality of *H. sosnowskyi* was sited in ATPOL system, according to "Atlas of distribution of vascular plants of Poland" (Zając 1978) (Fig. 1).

The diagnostic features of *H. sosnowskyi* are not clear enough, so it is often mistaken with *Heracleum mantegazzianum* Sommier & Levier. The main feature to distinguish *H. sosnowskyi* from *H. mantegazzianum* is that it has thick and rough pubescence on rays and pedicels, also specific attributes of leaf blades (Rutkowski 2004). Whilst the rays and pedicels of *H. mantegazzianum* are mild, less hairy whilst leaf blades more divided, acute at the top of the lobe and sharply incised on its margins (Brummit 1968). Herbarium Alegatas were put into Institute of Botany and Genetics, Pomeranian Academy in Słupsk (acronym in Index Herbariorum – SLTC).



Ryc. 1. Distribution of *Heracleum sosnowskyi* Manden.
GRID SQUARE AB: *PROV. ZACHODNIOPOMORSKA*. **08** – 1. Mrzeżyno, 2. **Roby (Trzebiatów Commune), 18** – 3. Gorzysław (Trzebiatów Commune), **19** – 4. **Gołańcz Pomorska (Trzebiatów Commune).**
GRID SQUARE BA: *PROV. ZACHODNIOPOMORSKA*. **66** – 5. Rusinowo (Postomino Commune); *PROV. POMORSKA*. **69** – 6. Strzelino (Słupsk Commune), **78** – 7. Swołowo (Słupsk Commune), **79** – 8. Sycewice (Kobylnica Commune), **89** – 9. Dobrzęcino (Kobylnica Commune), **98** – 10. Żukowo (Sławno Commune).
GRID SQUARE BB: *PROV. ZACHODNIOPOMORSKA*. **01** – 11. Bagicz (Ustronie Morskie Commune), 12. Gąskowo (Dygowo Commune), 13. Kołobrzeg-Podczele (Kołobrzeg Commune), 14. Stojkowo (Dygowo Commune), **02** – 15. Jazy, 16. Skoczów Kołobrzeski, 17. Wrzosowo (Dygowo Commune), **08** – 18. Borzysław, 19. Osowo, 20. Płocko, 21. Pustowo (Kępice Commune), **09** – 22. Biesowice, 23. Ciecholub (Kępice Commune), **10** – 24. Ząbrowo (Gościno Commune), **11** – 25. Pustary, 26. Włościbórz (Dygowo Commune), **12** – 27. Kłopotowo (Dygowo Commune), **17** – 28. Cetuń (Polanów Commune), **18** – 29. Przytocko (Kępice Commune), **22** – 30. Laski, 31. Nasutowo (Białogard Commune). **23** – 32. Gruszewo, 33. Łęczno (Białogard Commune), **24** – 34. Dobrowo (Tychowo Commune), **27** – 35. Górawino (Bobolice Commune), **33** – 36. Nawino (Białogard Commune), **35** – 37. Tychowo (Tychowo Commune), **36** – 38. Ujazd (Bobolice Commune), **43** – 39. Buślary, 40. Połczyn Zdrój (Połczyn Zdrój Commune), **46** – 41. Grzmiąca, 42. **Równe (Grzmiąca Commune), 57** – 43. Gałowo (Szczecinek Commune), **72** – 44.Gudowo (Drawsko Pomorskie Commune), **82** – 45. Linowo, 46. Lubieszewo, 47. Stawno (Złocieniec Commune).
GRID SQUARE CA: *PROV. POMORSKA*. **53** – 48. **Charbrowo (Wicko Commune), 54** – 49. Krępa Kaszubska (Wicko Commune), **70** – 50. **Głobino, 51. Słupsk (Słupsk Commune), 71** – 52. Domaradz (Damnica Commune), **74** – 53. Osowo Lęborskie (Cewice Commune), **84** – 54. Bochówko (Czarna Dąbrówka Commune), 55. Dolina Jadwigi (Sierakowice Commune), **91** – 56. Wierszyno (Kołczygłowy Commune).
GRID SQUARE CB: *PROV. POMORSKA*. **03** – 57. **Rzepnica (Bytów Commune), 51** – 58. Dobrzyń (Przechlewo Commune), **61** – 59. **Barkowo (Człuchów Commune), 62** – 60. Jęczniki Wielkie, 61. Przytok (Człuchów Commune).

RESULTS

In the years 2000-2006 there were carried out field observations of distribution *H. sosnowskyi* in Central Pomerania (Table 1). Mainly it was classified as a plant which went wild from agricultural crops. There were noted only four cases of growing *H. sosnowskyi* as decorative plants, as follows: in a municipal square, flowerbed, garden by the house and allotments (Słupsk, Charbrowo, Mrzeżyno and Połczyn Zdrój). This expansive kenophyte penetrates plant communities in manorial parks, roadsides, outskirts of meadows and grasslands, ditches, sewage canals and fields. The biggest populations of that species occurred in manorial parks in: Ciecholub (about 1.3 ha), Domaradz (0.8 ha), Kłopotowo (about 0.9 ha), Osowo Lęborskie (about 0.5 ha), Sycewice (about 1.1 ha). It often happened that they were 3.0-3.5 metres high. A vast numbers of *H. sosnowskyi* were observed on the roadsides of highways in Borzęcino, Dobrzyń, Gąskowo, Kołobrzeg-Podczele, Pustary and Stojkowo. Generally the pieces were 0.6-1.0 km long and 1.0-1.5 m wide. Moreover, vast localities were noted on the outskirts of fields,

TABLE 1. Floristic comparision of syntaxa from class *Artemisietea vulgaris* Lohm., Prsg et R. Tx. in R. Tx. 1950 with *Heracleum sosnowskyi* Manden.

Community	A	B	C	D	E
Number of relevés	11	22	15	16	8
Number of vascular plant taxa	52	43	54	49	35
Mean number of vascular plant taxa in the relevé	17	21	12	19	11
Heracleum sosnowskyi	**V$^{2-4}$**	**V$^{1-3}$**	**IV$^{2-3}$**	**IV^{+-1}**	**III$^{1-2}$**
Aegopodium podagraria	V$^{2-4}$	.	II^{+-1}	II^{+}	II^{1}
Lamium album	III^{+-1}	II^{+}	II^{+}	II^{+-1}	I^{+}
Anthriscus sylvestris	II^{+}	V$^{1-4}$	.	III^{+-2}	.
Petasites hybridus	.	.	V$^{3-4}$	.	.
Elymus repens	II^{+}	V^{+-2}	II^{+-1}	IV$^{1-4}$	II^{+}
Urtica dioica	III^{+-3}	IV^{+-3}	.	V$^{1-4}$	.
Reynoutria sachalinensis	.	.	.	.	V$^{3-4}$
Ranunculus repens	IV^{+-1}	IV$^{1-2}$	III^{+-1}	III^{+}	II^{+-1}
Taraxacum officinale	IV^{+}	IV^{+-1}	.	II^{+-1}	I^{+-1}
Equisetum arvense	III^{+}	III^{+-1}	II^{+-1}	III^{+-2}	I^{+-1}
Artemisia vulgaris	III^{+-1}	III^{+}	II^{1}	III^{+-2}	.
Tanacetum vulgare	III^{+}	III$^{1-2}$	I^{r-+}	.	.
Glechoma hederacea	III^{+-1}	II^{+}	II^{+-1}	I^{+}	.
Heracleum sibiricum	.	III^{r-1}	II^{+-1}	II^{+}	.
Veronica chamaedrys	II^{+-1}	III^{+-1}	II^{+-1}	II^{+-1}	I^{+-1}
Poa nemoralis	II^{+-1}	I^{+-1}	III^{+-1}	II^{r-1}	I^{1}
Matricaria maritima subsp. *inodora*	II^{+}	II^{+-1}	I^{+-1}	III^{+-1}	I^{1}
Phalaris arundinacea	II^{+}	II^{+-1}	.	II^{r-1}	II^{1}
Lapsana communis	II^{+}	II^{1}	.	.	I^{+}
Lamium purpureum	II^{r-+}	II^{+-1}	.	.	I^{+}
Stellaria media	.	II^{+}	II^{+-1}	.	I^{+-1}
Geum urbanum	II^{+-1}	II^{+}	III^{+-1}	.	.
Chelidonium majus	II^{+-1}	II^{+}	.	.	.
Melandrium album	III^{+}	II^{+}	.	.	.
Poa trivialis	II^{+}	II^{+-1}	.	.	.
Adoxa moschatelina	II^{+}	.	II^{+-2}	.	.
Ficaria verna	II^{+}	.	II^{+}	.	.
Galeobdolon luteum	II^{+}	.	I^{+-1}	.	.
Potentilla reptans	.	II^{+-1}	II^{+}	.	.
Galeopsis pubescens	.	.	II^{+}	.	II^{+-1}
Telekia speciosa	II$^{1-3}$	.	.	.	.
Galeopsis tetrahit	.	.	..	II^{+-1}	.
Conium maculatum	.	.	.	.	II^{+}

A – *Urtico-Aegopodietum podagrariae* (Tx. 1963 n.n.) em. Dierschke 1974; B – *Anthriscetum sylvestris* Hadač 1978; C – *Phalarido-Petasitetum hybridii* Schwick. 1933; D – *Agropyro-Urticetum dioicae* Hadač 1978; E – community with *Reynoutria sachalinensis*.

Table included species on at least in stability class II.

Species occuring only in stability class I (in brackets – community).

Acer platanoides c (A, B, C), *Aesculus hippocastanum* c (B, C, D), *Ajuga reptans* (A, D), *Alchemilla monticola* (A, D), *Arctium lappa* (C, D, E), *A. tomentosum* (A, B, C, D), *Artemisia absinthium* (E), *Atriplex patula* (C, E), *Capsella bursa-pastoris* (A, C), *Caltha palustris* (C), *Cerastium holosteoides* (B), *Chamomilla recutita* (B, D), *Ch. suaveolens* (A, D), *Chenopodium album* (B, C, D), *Cirsium oleraceum* (B, C, D), *Convolvulus arvensis* (D, E), *Conyza canadensis* (B, E), *Deschampsia caespitosa* (A), *Epilobium adenocaulon* (E), *E. montanum* (A), *Equisetum sylvaticum* (A), *Fallopia convolvulus* (C, E), *Filipendula ulmaria* (B, C), *Galeopsis speciosa* (C, D, E), *Galinsoga ciliata* (C), *G. parviflora* (C, E), *Galium aparine* (A, C, E), *G. mollugo* (A, B, D), *Geranium robertianum* (A, D), *Humulus lupulus* (A), *Hypericum perforatum* (A), *Holcus lanatus* (A), *Lamium amplexicaule* (C), *L. maculatum* (A, D), *Linaria vulgaris* (D), *Medicago lupulina* (C, D), *Myosotis arvensis* (D), *Myosoton aquaticum* (C), *Oxalis acetosella* (A), *Phragmites australis* (B, C, D), *Plantago lanceolata* (D), *P. major* (A, B, E), *P. intermedia* (E), *Poa annua* (A, D, E), *Polygonum aviculare* (C, E), *P. lapathifolium* subsp. *lapathifolium* (C), *P. persicaria* (C, E), *Populus tremula* c (B), *Potentilla anserina* (C, B, D), *Quercus robur* c (A, D), *Ranunculus acris* (C, E), *R. lanuginosus* (C), *Rubus caesius* (A), *R. idaeus* (B, D), *Rumex crispus* (B), *Salix cinerea* c (D), *Scirpus sylvaticus* (C), *Sisymbrium officinale* (D, E), *Sonchus arvensis* (B, C, D), *Sorbus aucuparia* c (A), *Stellaria graminea* (A, D), *S. nemorum* (C), *Thlaspi arvense* (C, E), *Torilis japonica* (A, D), *Trifolium repens* (D, C, D), *Tussilago farfara* (A, C, D), *Veronica arvensis* (C), *V. chamaedrys* (A, D), *V. persica* (B, C), *Vicia angustifolia* (A, D), *Viola odorata* (C, E).

meadows and grasslands in Borzysław, Dobrowo, Dolina Jadwigi, Głobino, Gołańcz Pomorska, Jęczniki Wielkie, Swołowo and Żukowo.

There were five nitrophilous skirt communities distinguished (Table 1, columns A-E) belonging to the alliance *Aegopodion podagrariae* R. Tx. 1967. They appeared in neglected gardens, manorial parks, thickets, beside roadsides and ditches with the company of *Aegopodium podagraria*. Many characteristic for syntaxa species from *Querco-Fagetea* class, like *Poa nemoralis*, *Adoxa moschatelina*, *Galeobdolon luteum*, *Ficaria verna* were found in nitrophilous skirts. What is more, synantropic species as *Stellaria media*, *Artemisia vulgaris*, *Equisetum arvense*, *Matricaria maritima* subsp. *inodora* were noticed. To sum up, in the analysed phytocenoses 67 taxa (from 35 to 54 in a particular phytocenose) were noted. There were between 11 to 21 species on every relevé on average. The low numbers of the species were caused by development of *H. sosnowskyi*, which valued permanent rank with IV-V. Only in locality with *Reynoutria sachalinensis* which permanent rank was V and high cover-abundance (4-5), the rank of *H. sosnowskyi* was lower – III.

Similar communities with *H. sosnowskyi* have already been described in North-Eastern Poland by KORNIAK and ŚRODA (2003).

CONCLUSIONS

1. *Heracleum sosnowskyi* is expansive species, which easily penetrates nitrophilous, anthropogenic communities.

2. Within many years of observations of its expansion, we are able to assume that *H. sosnowskyi* is permanent antropophyte in Central Pomerania flora.

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For citation: Sobisz Z. (2007): Phytocenoses with *Heracleum sosnowskyi* Manden. in Central Pomerania. Rocz. AR Pozn. 386, Bot.-Stec. 11: 53-56.