



INTRODUCTION

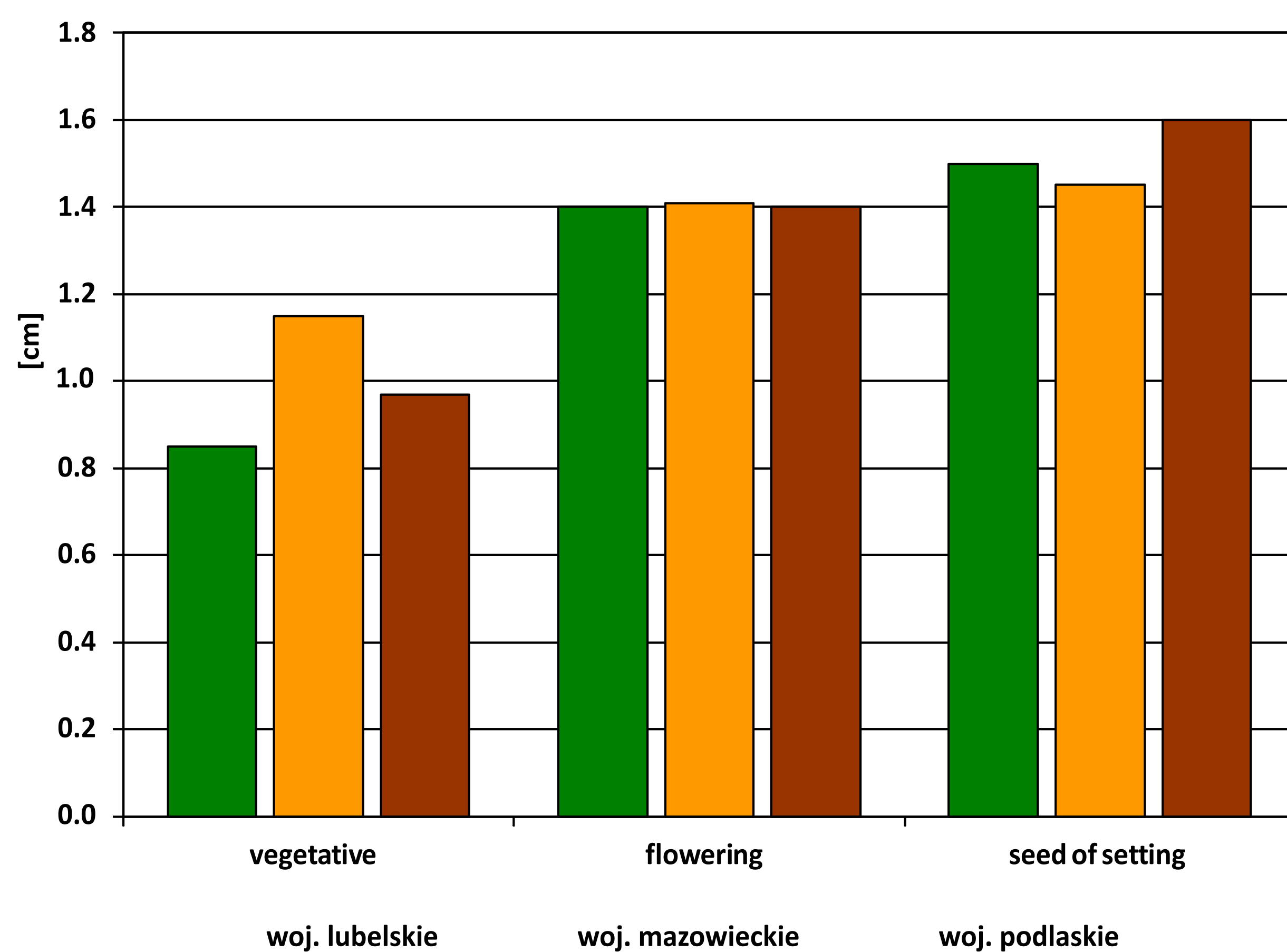
Plants in the genus *Plantago*, more commonly known as plantains, have been considered valuable for their herbal properties for centuries. The herb is astringent, anti-toxic, antimicrobial, anti-inflammatory, anti-histamine, as well as demulcent, expectorant, styptic and diuretic. Many of them are perennial species. In Poland growing the most common species on natural sites are: *Plantago major* L., *P. media* L. and *Plantago lanceolata* L. Herbal raw material obtained from these species are leaves.

The aim of this study was to analyze the variability of morphological, developmental, and chemical characteristics of 15 wild growing in Poland populations of the greater plantain.

MATERIAL AND METHODS

The research were conducted in the province of Lublin, Mazovia, and Podlasie. The plants were harvested at different developmental stages, i.e., vegetative, generative, and seed formation. Morphological and chemical characteristics were done for the above- and underground organs. Fresh and air dry mass per one plant were define, as well as content of polyphenolic acids and irydoid glycosides in leaves and roots. In leaves content of flavonoids also was determined according to the method described in Polish Pharmacopoea VII (2006).

RESULTS



Length of leaves in three development phase of plants (cm)



woj. lubelskie

woj. mazowieckie

woj. podlaskie

Content of irydoid glycosides in herb (%)

POPULATION	VEGETATIVE PHASE	FLOWERING PHASE	SEED OF SETTING PHASE
woj. lubelskie	0.95	1.07	1.17
woj. mazowieckie	1.03	1.10	1.15
woj. podlaskie	1.07	1.15	1.30
Mean	1.02c	1.1b	1.2a

Content of irydoid glycosides in roots (%)

POPULATION	VEGETATIVE PHASE	FLOWERING PHASE	SEED OF SETTING PHASE
woj. lubelskie	1.20	1.37	1.40
woj. mazowieckie	1.18	1.27	1.36
woj. podlaskie	1.27	1.29	1.45
Mean	1.22c	1.31b	1.40a

Content of flavonoids in herb (%)

POPULATION	VEGETATIVE PHASE	FLOWERING PHASE	SEED OF SETTING PHASE
woj. lubelskie	1.32	1.22	0.92
woj. mazowieckie	1.00	0.82	0.67
woj. podlaskie	1.07	0.97	0.63
Mean	1.13a	1.00b	0.74c

Content of polyphenolic acids in herb (%)

POPULATION	VEGETATIVE PHASE	FLOWERING PHASE	SEED OF SETTING PHASE
woj. lubelskie	0.60	0.56	0.68
woj. mazowieckie	0.56	1.20	0.87
woj. podlaskie	0.88	0.70	0.74
Mean	0.68c	0.82a	0.77b

Content of polyphenolic acids in roots (%)

POPULATION	VEGETATIVE PHASE	FLOWERING PHASE	SEED OF SETTING PHASE
woj. lubelskie	0.41	0.97	0.68
woj. mazowieckie	0.40	1.20	0.46
woj. podlaskie	0.46	0.70	0.48
Mean	0.42c	0.59a	0.48b

CONCLUSIONS

1. Analyzed plants varied in morphological characteristics, in particular: height, number, and size of leaves
2. Noted were significant differences between plants in the content of irydoid glycosides, polyphenolic acids and flavonoids.
3. The plants collected in the second term (in the generative phase) characterized the highest content of polyphenolic acids in the herb (0.82%) and roots (0.59%).
4. The highest content of flavonoids found in the raw materials harvested at the beginning of May (1.13%).
5. The herb harvested at the seed of setting characterized by the highest content of irydoid glycosides (1.2%), while the lowest - in the vegetative phase (1.02%).
6. The content of irydoid glycosides in the roots was higher than in the herb (1.40%).