Morphological and chemical variability within annual species of the genus *Plantago* L.

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INTRODUCTION

Genus *Plantago* is represented in the flora of the world's by 250 species. In Poland on natural sites 14 species has been described, among which there are annuals, biennial and perennial plants. Among annuals native species there is *Plantago coronopus* L., which is very rare in Poland and occurs only along the coast of the Baltic Sea. *Plantago psyllium* L. is another annual plant, which naturally occurs in the western Mediterranean, northern Africa and western Asia. In Poland this species is cultivate to obtain seeds, belonging to the group of mucinous raw materials.

The aim of this study was to evaluate two annual species: *P. psyllium* L. and *P. coronopus* L. in terms of morphological and chemical variability.

MATERIAL AND METHODS

The study included three populations of *P. psyllium* and four populations of *P. coronopus*. Seeds of above populations brought from botanical gardens in Brno, Zurich, Dijon, Rostock and Wiena, and also bought in garden center in Warsaw (Table 1). Seedlings were planted in the field at the end of April 2010 and 2011. In the second decade of July from each population the 25 randomly selected objects were cut and morphological observations were carried out, including plant height, width of the leaf rosette, leaf length and length of inflorescences. The content of irydoide glycosides in the air-dry leaves and inflorescences was determined (results are the mean of two years).

Photo 1. *Plantago psyllium*

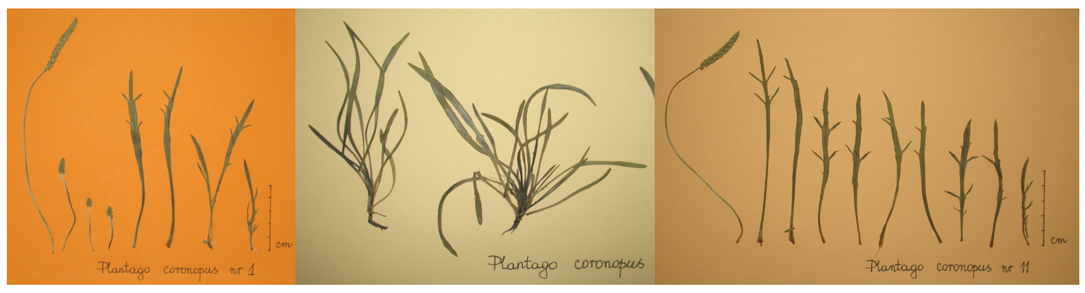

Photo 2. *Plantago coronopus*

Table 1. Origin of *Plantago psyllium* and *Plantago coronopus* seeds

No.	Species / population	Number of population	Seeds origin
1	*Plantago psyllium*	5	Botanical Garden Brno, Czech Republic
2	*Plantago psyllium*	6	Botanical Garden Zurich, Switzerland
3	*Plantago psyllium*	32	Garden Center – Warsaw, Poland
4	*Plantago coronopus*	1	Botanical Garden Brno, Czech Republic
5	*Plantago coronopus*	10	Botanical Garden Dijon, France
6	*Plantago coronopus*	11	Botanical Garden Rostock, Germany
7	*Plantago coronopus*	12	Botanical Garden Wien, Austria

RESULTS

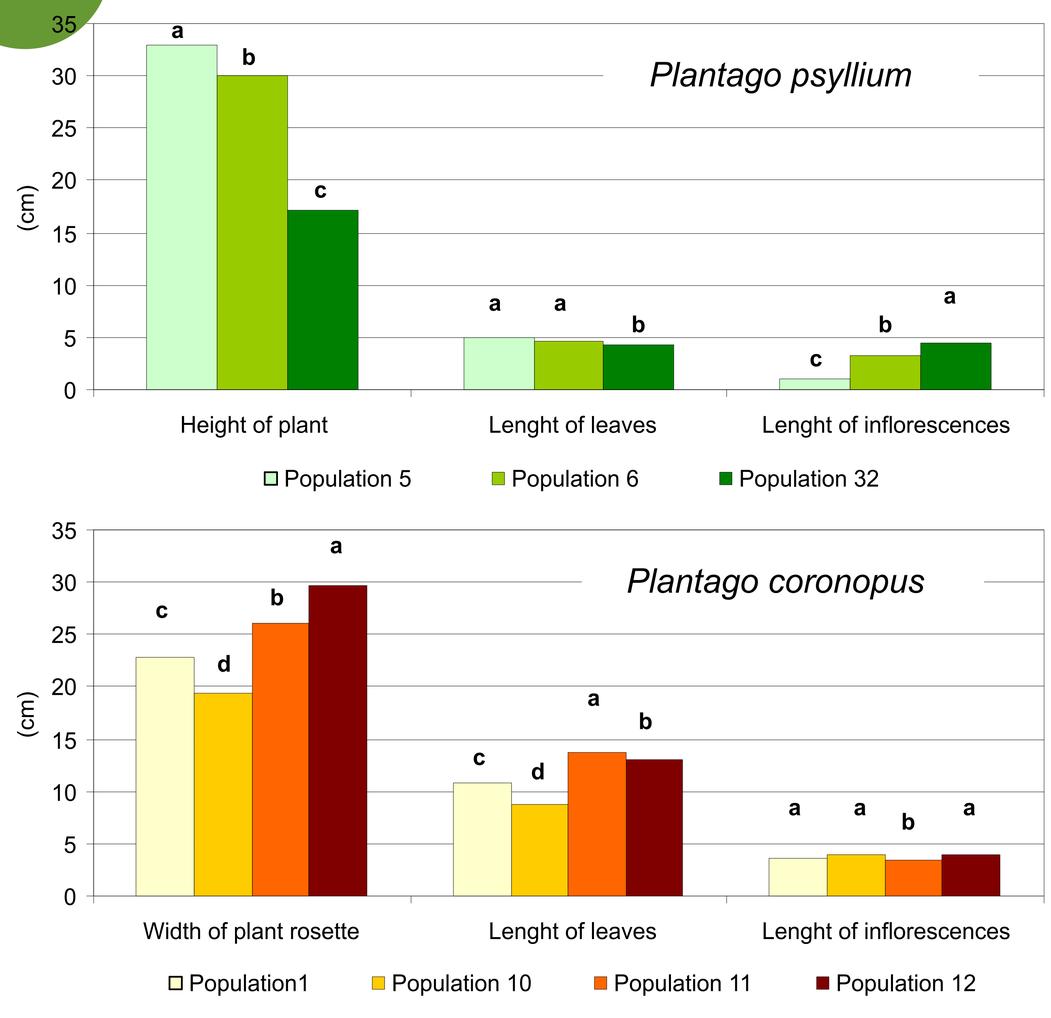

Figure 1. Morphological characteristic of *Plantago psyllium* and *Plantago coronopus* [cm]

Note: Means marked with different letters differ significantly at α = 0.05

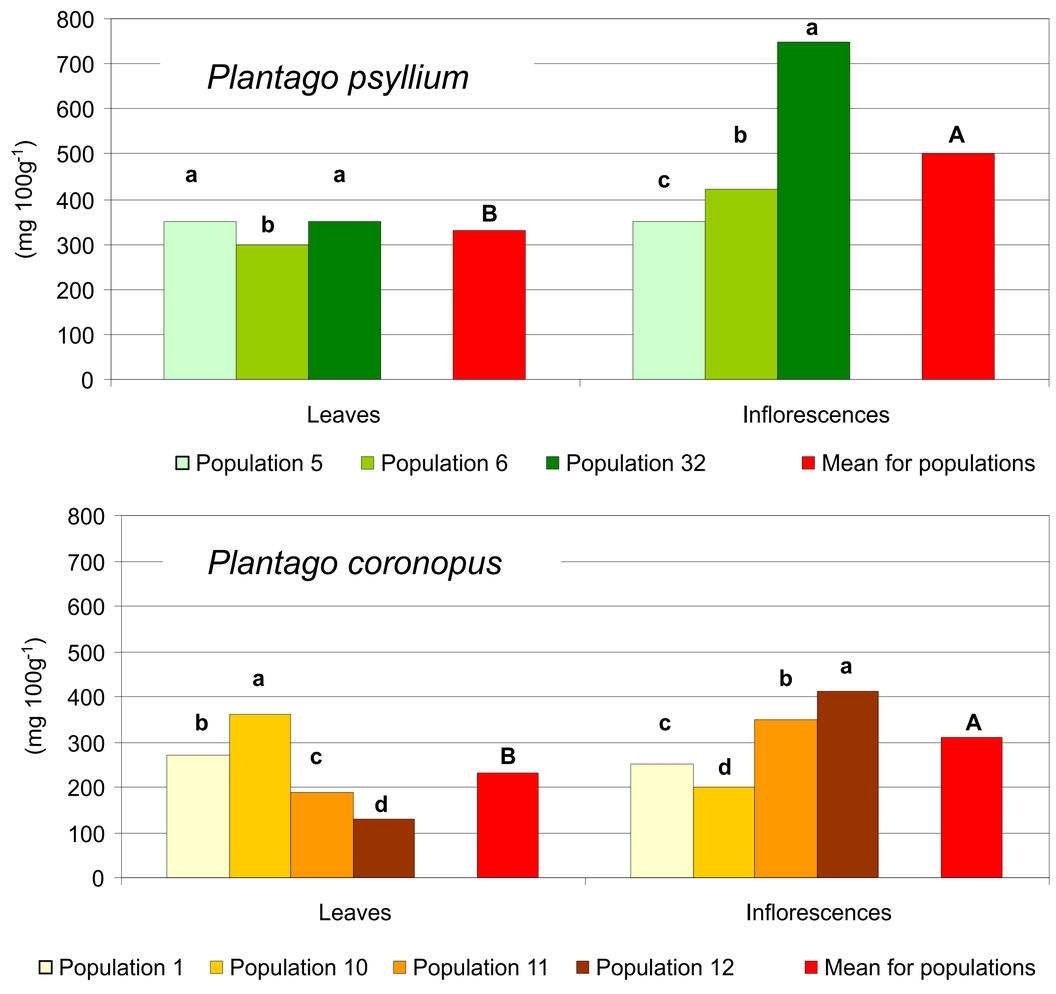

Figure 2. Content of irydoide glycosides in leaves and inflorescences of *P. psyllium* and *P. coronopus* [g 100 g^{-1}]

Note: Means marked with different letters differ significantly at α = 0.05

CONCLUSIONS

1. **Investigated populations differ significantly in terms of all assessed morphological features.**
2. **In both tested species the content of irydoide glycosides in inflorescences is higher than in leaves.**
3. **Higher content of irydoide glycosides in *Plantago psyllium* is observed in comparison with *Plantago coronopus*.**