

# INTER- AND INTRASPECIFIC COMPETITION OF *SOLIDAGO GIGANTEA* Ait. AND *S. CANADENSIS* L. s. l.

by

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In relation to chorological and biological analysis of some North American expansive goldenrods, experimental examination on competition between *Solidago gigantea* and *S. canadensis* s. l. was carried out. It consisted of following parts:

1. Chemical interaction (allelopathy) at seed germination stage (a laboratory experiment, on Petri dishes with filter paper or sandy soil substrates);
2. Competition in early phases of vegetative development i. e. between seed germination and the end of the first growing season (a greenhouse pot experiment);
3. Competition in later phases of vegetative development i. e. from a 6-7 week old seedling to the first blooming (a pot experiment in a garden);
4. Competition within mature populations (in garden experimental plots).

Distinct inhibitory influence from aqueous extracts from *S. canadensis* leaves, roots and seeds in the initial period of seed germination of both species was found. *S. gigantea* seed extracts inhibited germination in *S. canadensis* too. On the other hand, germination in *S. gigantea* was to a great extent stimulated by all its own extracts (on the sandy soil substrate). The results suggest that allelopathy might be one of the factors which control interactions between both species, and operate already in seed germination.

During vegetative development (from the earliest seedling phase) *S. gigantea* turned out to be a competitively stronger species than *S. canadensis*; resulting from such physical characteristics as larger seedling size and biomass as well as its higher drought resistance.

Within mature populations of both species significant predominance of *S. canadensis* became stabilized after a few years. In ten-year-old mixed cultures, *S. gigantea* was still present, although not numerous, and only as vegetative stems with visibly reduced vitality. In monocultures of the same age, *S. canadensis* retained its sexual reproduction ability for a longer time than *S. gigantea*.

Arrangement of the data collected is continuing and a paper is expected to be finished after 1990.

## References

1. Guzikowa, M. (msc.). Biological reasons of *Solidago gigantea* Ait. and *S. canadensis* L. s. l. expansion in Poland.
2. Guzikowa, M., Maycock, P. F. 1986. The invasion and expansion of three North American species of goldenrod (*Solidago canadensis* L. sensu lato, *S. gigantea* Ait. and *S. graminifolia* L. / Salisb) in Poland. Acta Soc. Bot. Pol. 55 (3): 367-384.