

# INFLUENCE OF EXTRACTS OF THE CANADIAN GOLDENROD ON THE DEVELOPMENT OF ECONOMICALLY SIGNIFICANT PHYTO- AND ENTOMOPATHOGENS

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## 1. Introduction

Phytoinvasion is considered to be the reason for the extinction of biological species and the loss of plant diversity in the world. The genus *Solidago* takes a special place among the invasive species in western European countries, while the Canadian goldenrod settles on abandoned fields, pastures and other uncontrolled or poorly controlled habitats so actively, that it is included in the "top 5" of the most dangerous invasive species in Belarus [1]. The aim of the research was to study the influence of complex extracts from the vegetative parts of the Canadian goldenrod (*Solidago canadensis* L.) on the development of economically significant pathogens.

In the course of the study, we used such pathogens as *Fusarium avenacium*, which causes fusariosis of cereal crops, *Botrytis cinerea*, which causes diseases of the gray and clamp rot, *Colletotrichum gloeosporioides*, which causes anthracnose and fetal decay, *Ascosphaera apis*, leading to the mummification of bees, *Sclerotinia sclerotiorum*, causing the white rot diseases [2].

## 2. Experimental Setup

A series of in vitro experiments was performed to test the presence of fungicidal / fungistatic activity of the extracts from *S. canadensis* against economically important pathogens. All the fungi were grown in Petri dishes on standard agar environment under standard conditions in the presence of *S. canadensis* extracts. Antibiotics - doxycycline and amoxicillin were injected in all cases. *S. canadensis* extracts were added in the experimental Petri dishes. The intensity of suppression of growth of mycelium cultures of pathogens in the presence of plant extracts was determined in comparison with the controls by measuring the radius of the mycelial fungi after 24, 48 and 72 hours. All the experiments were carried out three times each.

## 3. Results

During the experiment we observed a noticeable fade in the development of a complex of pathogenic species of agricultural crops *Fusarium avenacium*, *Botrytis cinerea*, *Colletotrichum gloeosporioides* and *Ascosphaera apis*. As a result, significant fungistatic effects of grass extracts on all phytopathogen species and moderate fungistatic effects of the root extracts and rhizomes in relation to *Botrytis*

*cinerea* and *Colletotrichum gloeosporioides*. As well as almost a complete absence of any effects on the *Fusarium avenacium* and *Ascosphaera apis* were discovered. The reaction of the phytopathogen *Sclerotinia sclerotiorum* to the extracts from the vegetative parts of the Canadian goldenrod requires further studies.

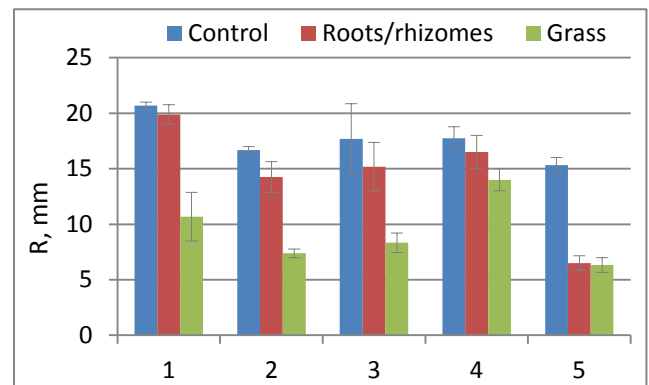


Figure 1 – The development of pathogenic fungi species after 72 hours: 1 - *F. avenacium*, 2 – *C. gloeosporioides*, 3 – *B. cinerea*, 4 – *A. apis*, 5 – *S. sclerotiorum*

## 4. Conclusion

According to the fact that the Canadian goldenrod is an aggressive, invasive species and requires destruction, we propose the use of the plant's biomass for the production of extracts that will allow us to reduce the damage caused to the crops and bees by widely spread phyto- and entomopathogens. Thus, the expansion of the Canadian goldenrod can be stopped without significant costs for the state, and may even bring profit, replenishing the accounts of the preparative forms of biologically active compounds of domestic production.

## 5. References

- [1] The biology of Canadian weeds. 45. *Solidago canadensis* L. / P.A. Werner [et al.] // Can. J. Plant Sci. – 1980. – Vol. 60, №4. – P. 1393–1409.
- [2] Shukanov A.S. Algology and mycology: practice, tutorial / A.S. Shukanov, A.I. Stephanovich, V.D. Polyxenova, A.K. Hramzov. BSU, 2007.