EFFECT OF *NEOTYPHODIUM LOLII* ON PRODUCTION OF β-1,3-GLUCANASES AND CHITINASES IN PERENNIAL RYEGRASS (*LOLIUM PERENNE* L.) INFECTED BY *FUSARIUM POAE*

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INTRODUCTION

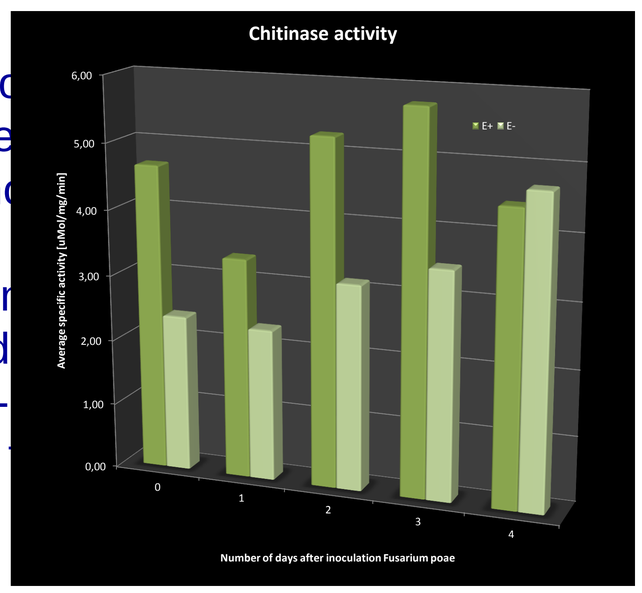
Lolium perenne is a grass of great importance in Polish farming. Diseases caused by pathogenic fungi such as *Fusarium* ssp. are substantial problem in its cultivation. Their harmfulness can be limited thanks to natural symbiotic systems between *L. perenne* and *N. lolii*. The endophyte is able to stimulate the growth of the plant and increase its resistance to biotic and abiotic stress. The exact mechanism of higher resistance of endophyte infected plant is yet not fully understood, but it can be assumed that PR (Pathogenesis-related) proteins have a significant role. Chitinases and β-1,3-glucanases are PR proteins, which are related to the plant resistance to fungi. They tend to occur together, as their integrated action can cause more damage in fungi cell wall, than any of them could cause alone. The aim of the study was to determine the impact of the endophytic fungi *N. lolii* on induction of specific defense mechanism, including production of pathogenesis-related proteins: chitinases and β-1,3-glucanases.

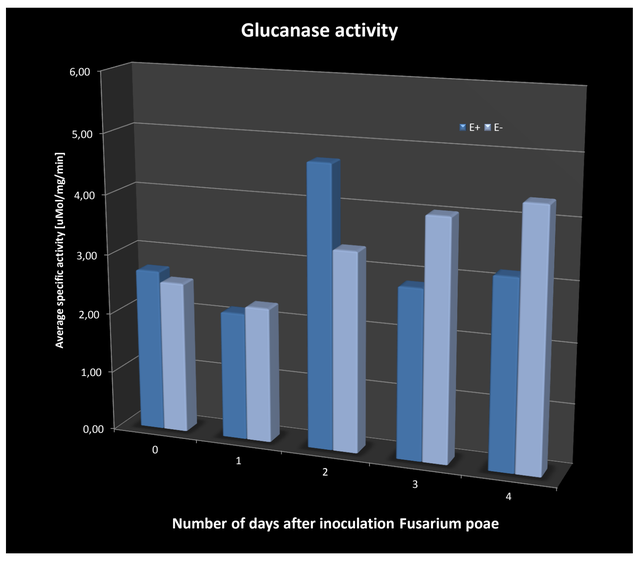
METHODS

The selected ecotype of perennial ryegrass - LpB70 was used for the research. Endophyte infected (E+) and uninfected (E-) plants were vegetatively propagated. For infectious experiment healthy and well-developed plants were chosen. They were inoculated with *Fusarium poae*. The experimental and control pots were separated and placed in foil isolator, which provided proper conditions for the growth of fungi. In seven days after inoculation the level of disease was measured with the use of Townsend and Heuberger formula. The quantity of chitinases and glucanases in E+ and E- plants was determined 0, 1, 2, 3 and 4 days after infection with *F. poae* with use of Albles et al. (1970) method with modifications. The specific activity of chitinases and glucanases in the extracts was expressed as moles of reducing sugars released in one minute of incubation per one milligram of total protein in the extract.

RESULTS

Inhabited plants were much less susceptible to infectio
F. poae. Occurrence of the endophyte has also affecte
the amount of chitinases in perennial ryegrass. Its amo
was significantly higher in E+ plants. The amount of
enzyme was also dependent on the time after infection
Upward trend was being observed since first to third d
after inoculation. No significant impact of *N. lolii* on β-
glucanases production and general protein content in
plant was observed.





CONCLUSIONS

- *Neotyphodium lolii* had significant influence on the level of infection in perennial ryegrass inoculated with *Fusarium poae*
- The presence of *Neotyphodium lolii* had significantly increased the activity of chitinases in three days after inoculation
- The presence of endophyte *Neotyphodium lolii* hadn't significantly affected the activity of β-1,3-glucanases
- The higher level of chitinases is possible to be one of the factors of higher resistance of endophyte infected plants