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Bacterial Gibberellins Induce Systemic Resistance of Plants

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It is generally agreed today that some rhizosphere bacteria can ensure induced systemic resistance to pathogens. In this paper we tested the ability of gibberellins produced by rhizosphere non-pathogenic bacteria *Pseudomonas aurantiaca* to induce systemic resistance to alternariosis agent – *Alternaria brassicicola* – in oilseed rape plants.

Oilseed rape (*Brássica nápus*) is one of the most promising oil-bearing croppers. It allows improving the supply of population with vegetable oil, animal and poultry industries with high quality vegetable protein. It is used for biofuel production as well.

Gibberellin preparation was isolated from liquid culture of strain *Pseudomonas aurantiaca* grown in 250 mL of M9 medium (48 h, 28 °C under darkroom conditions). Gibberellins were extracted according procedure described by Tien *et al.* (1979). Gibberellins concentration in the medium was determined by fluorometric method.

Elicitor activity of bacterial metabolites – gibberellins – was analyzed in model system of artificial inoculation of oilseed rape germs with phytopathogenic fungi *Alternaria brassicicola*. The elicitor action efficiency was evaluated on the 15th day of oilseed rape cultivation based on the percentage of leaf surface covered by necrotic lesions.

Gibberellins were shown to induce systemic resistance resulted in decreasing of oil seed plants vulnerability by 52.7%.

It is known that under the unfavorable conditions plants synthesis the reactive oxygen intermediates which activate destructive processes. One of the first organism reactions to stress action is the change of the lipid peroxidation level. It was shown that treatment of the soil with gibberellins resulted in decreasing of the lipid peroxidation level twofold.

Gibberellins were shown to have a similar effect on permeability of cell membranes for free nucleotides. The permeability of cell membranes in leaves decreased 2.8-fold at room temperature. We suggest that gibberellins stabilize and strengthen the cytoplasmic membrane that results in the barrier mechanisms induction and pathogen invasion prevention.

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