

ANTAGONISTIC PROPERTIES OF LACTOBACILLUS PLANTARUM AGAINST AGENTS OF BACTERIAL WILT AND SOFT ROT

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The soft rot and bacterial wilt are the diseases that affect plants in soil and under the storage. Application of lactobacilli is the promising trend of organic farming.

The aim was to study the effect of *L. plantarum* cultures, isolated from plant material, on agents of wilt and bacterial soft rot – *Erwinia carotovora* and *Ralstonia solanacearum*.

Antagonistic properties of *Lactobacillus* strains isolated from plant material in Ukraine and France were investigated. Method of holes on lawns of pathogens was conducted to study the effect of lactobacilli *in vitro*. In first case the supernatant culture fluid with low initial pH and in second case the supernatant with neutralized pH was used.

All studied 15 strains of *L. plantarum* showed antagonistic activity against agents of soft rot and wilt in nutritional medium. 40,0% and 46,7% of the strains of *L. plantarum* caused growth inhibition of soft rot agent in large and medium extent. Instead, the wilt pathogen was more resistant to *Lactobacillus* metabolites. Most of the strains of lactobacilli - 80% had low inhibition effect on pathogenic *Ralstonia solanacearum* 1109 UKM. Therefore antagonistic activity against different strains of pathogens is a strain-specific characteristics. The same strains of lactobacilli suppressed various pathogens in a greater or lesser extent. In general, *E. carotovora* strains were more sensitive to metabolites of the studied *L. plantarum* strains.

Inhibition of bacterial wilt and soft rot was due the low pH of lactobacilli culture fluid because neutralized culture fluid didn't inhibit the growth of pathogens.

Using the model of carrot explants revealed that all investigated lactobacilli strains *in vivo*, except *L. plantarum* 352 ONU isolated in France, showed an antagonistic effect to soft rot agent *E. carotovora* ZM1. In general, 80% of the investigated of lactobacilli strains showed a high level of protection of plants, inhibiting the development of soft rot in 100%.

Since wilt pathogen was characterized by low sensitivity to metabolites of lactobacilli, one strain *L. plantarum* ONU 12 was chosen for experiments on test plants. Dipping plant roots in suspension culture with lactobacilli and pathogens led to decreasing of the plants with wilt only in 18,6%. Thus, the use of lactobacilli in plant protection against *R. solanacearum* wasn't so effective as *E. carotovora*. Moreover less efficiency appears both *in vitro* and *in vivo*.

Consequently, the use of *L. plantarum* may be recommended to protect plants from soft rot, but not from bacterial wilt.