

BIOFILM FORMATION OF *LACTOBACILLUS PLANTARUM* ON PLANT SURFACES

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Attachment of *Lactobacillus plantarum* to plant surfaces and biofilm formation are poorly understood. To create a biotechnology for the plant protection from pathogens the study of mechanisms of adhesion of lactobacilli and selection of the strains with the high ability to biofilm formation is needed.

The aim of the work was to study the ability of *L. plantarum* strains isolated in Ukraine and France to adhesion and biofilm formation.

Properties of thirteen strains of *L. plantarum*, isolated in France from grape must and properties of seventeen strains of *L. plantarum* isolated in Ukraine from mash and pickles and also properties of two reference strains were compared.

Antagonistic activity against crown gall was studied. In experiments using “well-diffusion” method in the medium all strains of *L. plantarum*, isolated both in Ukraine and in France, were characterized by a strong antagonistic activity against pathogens *Rhizobium radiobacter* and *R. vitis*.

All 32 strains of *L. plantarum* showed high levels of biofilm formation (+++++) on stems, leaves and seed surfaces of *Lepidium sativum*.

Different strains showed different levels of biofilm formation on root. Also differences between strains isolated in different geographical areas were found. The majority of French isolates had an average level of biofilm formation, consisting of well formed microcolonies without any developed matrix layer. Almost the same number of Ukrainian isolates showed average and low level of biofilm formation. But the number of the strains with high levels of biofilm formation was slightly higher.

To create a biological preparation, the competitive adhesion of antagonistic strain *L. plantarum* ONU 355 and a pathogen *R. radiobacter* PYZ with luminous plasmid GFP was studied.

When lactobacilli were attached to the glass first, and pathogen suspension was added after to the biofilm of lactobacilli, attachment of *R. radiobacter* PYZ was less developed than in the positive control without lactic acid bacteria.

There was a complete absence of pathogens on the glass after the glass was treated by the pathogen culture at first, and lactic acid bacteria applied next day. Lactobacilli completely destroyed pathogen layer of cells on the glass.

Attachment and biofilm formation of lactobacilli prevent adhesion of pathogens, and this phenomenon can be the protective role of lactobacilli on plant surfaces.

The ability of lactobacilli to compete with pathogens is extremely promising feature to create biological protection of plants.