

## **PROCEDURE FOR BIOLOGICAL CONTROL OF BACTERIAL WILT CAUSED BY *RALSTONIA SOLANACEARUM* BY THE USE OF SPECIFIC BACTERIOPHAGES.**

### **INVENTION DESCRIPTION**

The bacterial species *Ralstonia solanacearum* causes bacterial wilt worldwide in numerous plant species, many of them of agronomic interest such as potatoes and tomatoes, producing serious economic losses in the agricultural sector. Therefore, this bacterium is considered a quarantine organism in the European Union, where it is subjected to strict measures regulated by European Directives. *R. solanacearum* control by chemical or physical treatments is usually not effective, expensive and with severe environmental impact. For this reason, new biological control methods which are effective and environmentally friendly are especially needed, such as the use of specific lytic bacteriophages against *R. solanacearum*.

Researchers of the University of Valencia and the Valencian Institute of Agricultural Science Research have isolated and patented new specific lytic bacteriophages against *R. solanacearum*, as well as the procedure associated with their use in the biological control of bacterial wilt. By way of this method, it becomes possible to control *R. solanacearum* populations, reducing bacterial wilt in

crops through an effective and environmentally friendly biological treatment.

The research activity of the R+D Team BACPLANT focuses on the study of plant-associated bacteria and their biotechnological applications. The team is led by Dr. Elena González Biosca and is attached to the Microbiology and Ecology Dpt. of the Faculty of Biological Sciences at the University of Valencia.

This research group counts on an authorized laboratory for the management of quarantine plant pathogenic bacteria in conditions of biosafety (level 2), has worked for years in the study of plant-bacteria interactions, and its beneficial or harmful effects. To reduce the latter, their research focuses on the diagnosis, characterization and study of the biology of pathogens that can enable the development of measures to prevent and control of bacterial diseases of plants.

### **BUSINESS APPLICATION SECTORS**

The main application of this invention is in the field of agriculture, particularly in the biological control of plant pathogens in plant species of agronomic interest.

### **TECHNICAL ADVANTAGES AND BENEFITS**

The main advantages provided by this technology are:

- Biological treatment for control of bacterial wilt caused by *R. solanacearum*, as an alternative to ineffective chemical or physical treatments.
- High specific bacteriophages against *R. solanacearum*.
- Bacteriophages harmless to other organisms, including beneficial microbiota of crops to be protected.
- Easy applicability, through irrigation water.
- Less significant environmental impact than chemicals, for which many pathogens have developed resistance.
- Minor legal restrictions for use and applicability where control with chemicals is prohibited.

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### DEVELOPMENT STATUS OF TECHNOLOGY

The technology has been validated in laboratory, and the research group is currently working on the development and scaling it.

### INTELLECTUAL PROPERTY RIGHTS

The technology is protected through the following patent:

Spanish patent application P201530730, titled "Procedimiento para la prevención y/o el control biológico de la marchitez causada por *Ralstonia solanacearum*, a través del uso de bacteriófagos útiles para ello y composiciones de los mismos".

### COLLABORATION SOUGHT

- License agreement, manufacturing or marketing.
- R & D project to complete the development or apply to other sectors.

### RELATED IMAGES

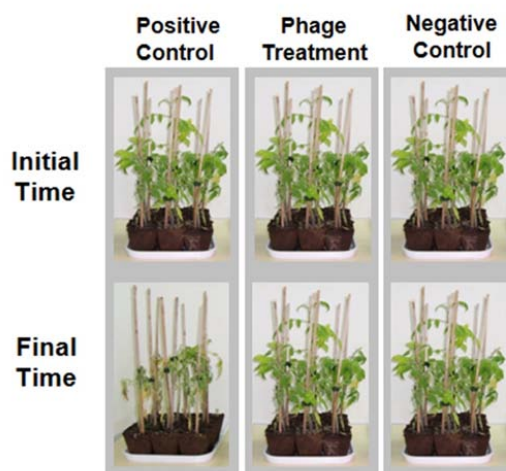


Image 1: Example of biological control of bacterial wilt caused by *Ralstonia solanacearum* in tomato plants treated or not with new patented specific lytic bacteriophages against this pathogen.

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