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INFLUENCE OF ENDOPHYTIC BACTERIA ON SEED GERMINATION AND SURVIVAL OF TOMATO (*SOLANUM LYCOPERSICUM*) IN SOIL INFECTED BY FUNGI *FUSARIUM OXYSPORUM*

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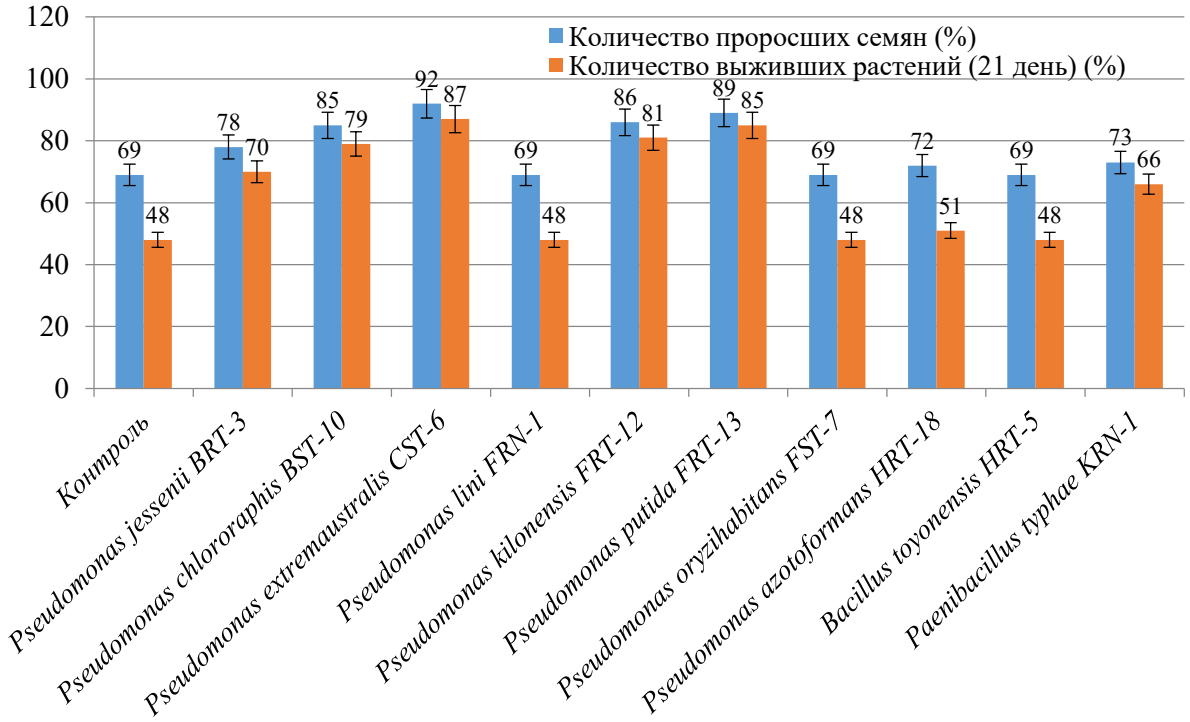
Abstract. *Many different antimicrobial drugs in the world stimulate plant growth and increase crop yields by reducing the spread of pathogenic fungi. However, the search for new strains of more effective bacteria never stops, and drugs are being developed that can give even better results. For example, many microbial preparations are based on rhizosphere bacteria that stimulate plant growth. These bacteria operate in the root zone and supply plants with nitrogen, phosphorus, and other substances from outside the plant.*

Keywords: *fusarium oxysporum, pseudomonas chlororaphis, pseudomonas extremaustralis, pseudomonas kilonensis, pseudomonas putida, capsicum annum group, solanum lycopersicum, capsicum annum group.*

Foods grown as a result of increased nitrate levels when growing these foods are also harmful to the body. Getting healthy vegetable products without increasing nitrate levels is of utmost importance. Therefore, today an important role is played by the development of organic fertilizers and microbial preparations that can significantly increase the yield of vegetable crops by increasing the natural communities of beneficial microorganisms in the soil.

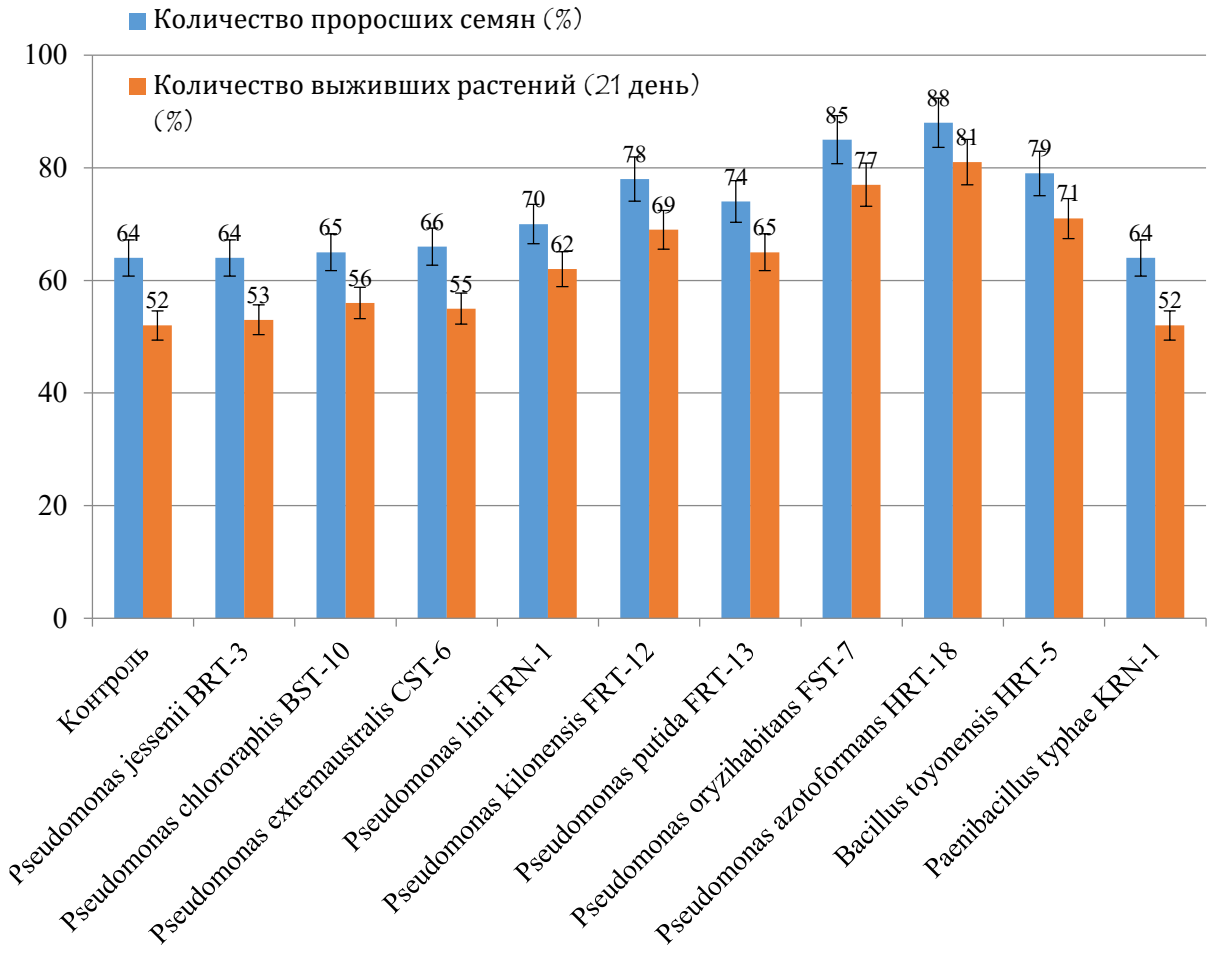


Drawing. 1. The influence of endophytic bacteria on seed germination and survival of tomato (Solanum lycopersicum) in soil infected with Fusarium solani fungi.

It is known from the literature that endophytes have gained scientific and commercial interest due to the association they have with the internal tissues of host plants, as they have proven their ability to improve plant quality and growth.

Figure 1 shows that in the control, when the soil was infected with the fungus Fusarium solani, the number of sprouted seeds was 69%, and the number of sprouted plants was 48%. The most effective in increasing these indicators, as in the case of cucumber, were *Pseudomonas chlororaphis* BST-10, which increased the number of sprouted seeds by 16%, and the number of surviving plants - by 31%, *Pseudomonas extremaustralis* CST-6 - by 23 and 39%, *Pseudomonas kilonensis* FRT-12 – by 17 and 33%, Pseudomonas putida FRT-13 – by 20 and 37%, respectively, relative to the control.

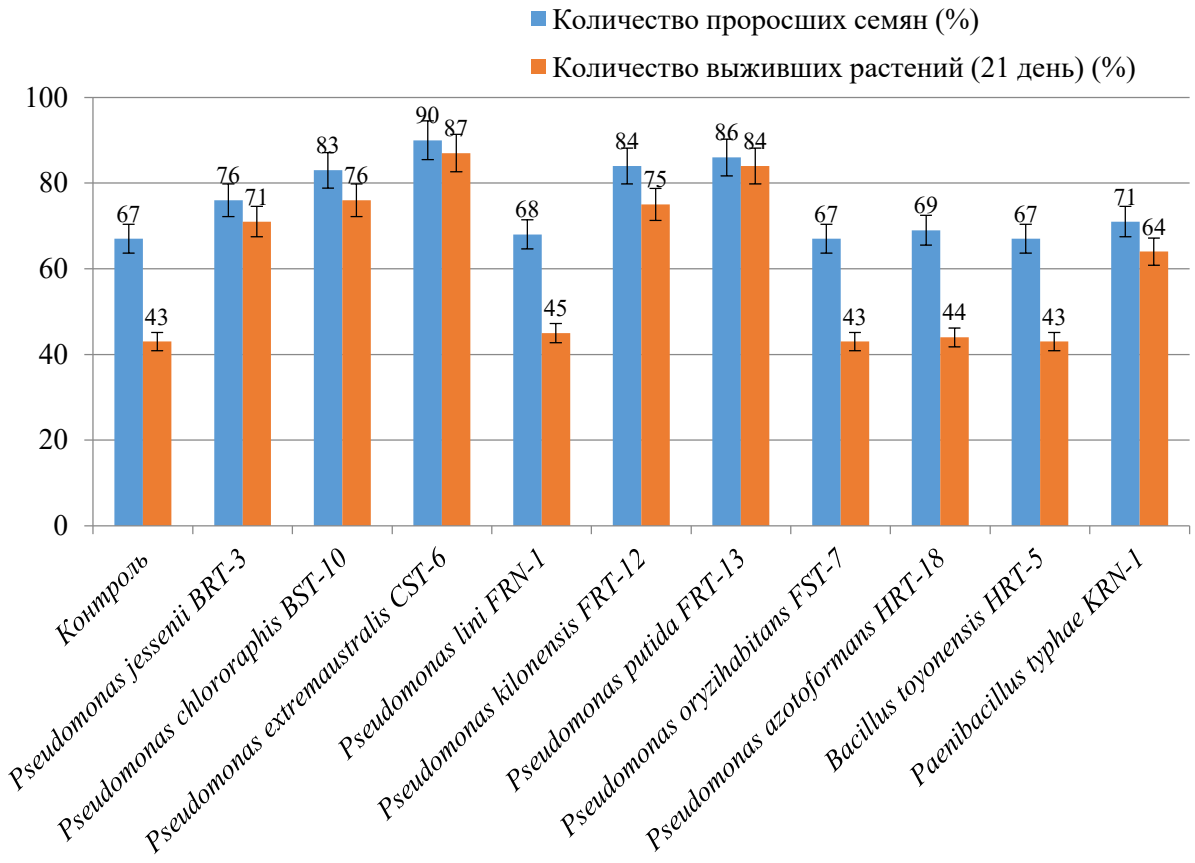
The number of germinated bell pepper seeds in the soil infected with *Fusarium oxysporum* was 64%, and the number of surviving plants was 52% in the control (Fig. 2). Inoculation of seeds with certain strains of bacteria increased these rates and, as in the case of cucumber and tomato, the same 3 strains of bacteria contributed to a significant increase in seed germination and plant survival.



Drawing. 2. The influence of endophytic bacteria on seed germination and survival of bell pepper (Capsicum annum Group) in soil contaminated with Fusarium oxysporum fungi.

Thus, the strain *Pseudomonas oryzihabitans* FST-7 increased the number of germinated seeds by 21%, and the number of surviving plants by 25%, *Pseudomonas azotoformans* HRT-18 - by 24 and 29%, *Bacillus toyonensis* HRT-5 by 15 and 19%, respectively, in relation to control.

The fungus *Fusarium solani* had an extremely negative effect on bell pepper and, as a result, in the soil contaminated with it, 67% of the seeds in the control germinated, and the number of surviving plants on 21 days was 43% (Fig. 3). 6 out of 10 strains improved these indicators, but 4 strains turned out to be the most effective: *Pseudomonas chlororaphis* BST-10, which increased the number of germinated seeds by 16%, and the number of surviving plants by 33%, *Pseudomonas extremaustralis* CST-6 – by 23 and 44%, *Pseudomonas kilonensis* FRT-12 – by 17 and 32%, *Pseudomonas putida* FRT-13 – by 19 and 41%, respectively, relative to the control.



Drawing. 3. The influence of endophytic bacteria on seed germination and survival of bell pepper (Capsicum annum Group) in soil contaminated with Fusarium solani fungi.

Conclusion. *Pseudomonas oryzihabitans* FST-7, *Pseudomonas azotoformans* HRT-18 and *Bacillus toyonensis* HRT-5 are effective biocontrol agents against the fungus *Fusarium oxysporum*. In turn, strains *Pseudomonas chlororaphis* BST-10, *Pseudomonas extremaustralis* CST-6, *Pseudomonas kilonensis* FRT-12 and *Pseudomonas putida* FRT-13 exhibit active biocontrol of the fungus *Fusarium solani*.

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