BIOAUGMENTATION EFFECT OF *COMAMONAS TESTOSTERONI* IN HCB-LOADING SOIL

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Due to safety, economy and prolonged effect bioremediation of pesticide-polluted soil ecosystems by the microorganisms - xenobiotic potential destructors has significant advantages compared to chemical and physical methods. It is important to study the effect of *Comamonas testosteroni* strains as potentially hexachlorobenzene (HCB) degrading agents on plant development and their resistance to biotic factors. The aim of the present study was to determine the effectiveness of the introduced *C. testosteroni* strains on the developing tomato plants and their resistance to phytopathogens under cultivating conditions in HCB-polluted gray podzolic soil.

Methods. The experiment was performed in the laboratory. The experiment was carried out in the following variants: 1 - uncontaminated soil; 2, 3 - introducing the *C. testosteroni* UCM B-400 and B-401 liquid culture into the unpolluted soil; 4, 5 – HCB-polluted soil at doses of 30 and 100 mg/kg; 6, 7 – HCB-polluted soil at 30 and 100 mg/kg doses, which was inoculated by *C. testosteroni* UCM B-400 liquid culture, 8 and 9 - HCB polluted soil at 30 and 100 mg/kg doses, which was inoculated by *C. testosteroni* UCM B-401 liquid culture. Tomato plants of the cultivar "Lagidniy" were used in all experimental variants. Biometric parameters (plant length, root length, root mass, and plant mass) were determined at the 3-4 leaf formation stage. Resistance to phytopathogens was studied by the Kreitzburg-Eggert method under artificial infection conditions of leaf plates with micromycete *Alternaria alternata* and bacteria *Clavibacter michiganensis* UCM B-629.

The obtained **results** demonstrate that introduction of studied strains in polluted soil exert the phytostimulating effect on plants, which is confirmed by the increasing of all biometric parameters, especially plant mass: by 17.5 and 20%, respectively for strains B-400 and B-401. In plants grown in HCB-polluted soil, growth inhibition was observed, and it was most pronounced in the variants with 100 mg/kg HCB: the plant mass decreased by 46% compared to control plants. The *C. testosteroni* liquid culture introducing into the contaminated soil reduced the negative impact of the pesticide load. Thus, compared to plants grown in polluted soil (30 and 100 mg/kg HCB) without bacterial inoculation, root mass of plants grown in soil after *C. testosteroni* UCM B-400 treatment increased by 24 and 19%, respectively. The treatment of polluted soil by liquid culture of *C. testosteroni* UCM B-401 strain resulted in the increasing of root mass up to 14.6% and 24.4% in the variants with 30 mg/kg and 100 mg/kg HCB respectively. Nevertheless all biometric indicators of these plants were 7.5 - 23% lower than in tomatoes grown in unpolluted soil. At the same time the gain of plant resistance to phytopathogens after inoculation of bacterial cultures into polluted soil was observed.

Conclusions. Introduction of *C. testosteroni* UCM B-400 and B-401 strains into the HCB-polluted soil improves conditions for plant development, has a phytostimulating and protective effects on tomatoes of cultivar “Lagidniy”.