GROWTH DYNAMICS OF NITROGEN-FIXING BACTERIA AT INCREASED SALINITY

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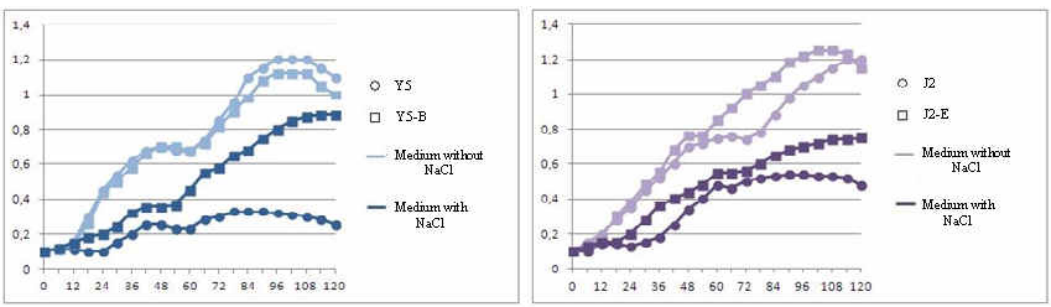
Nowadays, one of the main problems in the field of agriculture is the process of soil salinization. Salinity has already affected more than 7% of the Earth's land area. One of the options for combating salinity is to minimize the use of harmful chemicals. Instead, environmentally friendly means should be used to restore saline arable soils and increase their fertility [1]. One of the widely used means are biofertilizers based on nitrogen-fixing microorganisms. These biofertilizers help plants absorb nutrients in saline conditions, leading to increased plant tolerance to salinity. All this has a positive effect on the process of restoration of saline soils, as well as on the improving the quality and quantity of the crop [2].

The purpose of this work was studying the growth dynamics of nitrogen-fixing strains in the presence of NaCl. The objects of research were cultures Y5 and J2, previously isolated by us from saline soils of the Armavir region of Armenia, and osmo-resistant mutants Y5-B and J2-E obtained on their basis.

Cultures were grown for 5 days in Burk's broth medium on an Innova 43 shaker (30 °C, 220 rpm) in the presence of 1.7% NaCl. A salt-free medium was used as a control. Sampling was carried out every 12 hours and the optical density was measured at a wavelength of 600 nm.

The difference in the dynamics of cultures growth in saline and non-saline conditions is shown in Figure 1. The dynamics of the growth of strain Y5 in a salt-free medium was similar to its mutant Y5-B, but in the presence of NaCl it showed a small growth, in contrast to its mutant capable of growing in a salt medium. In the case of J2, on a salt-free medium the strain showed more passive growth compared to its J2-E mutant. This pattern is also present in the nutrient medium containing NaCl.

As a result, it can be concluded that osmotic-resistant mutants of strains Y5 and J2 are able to maintain their normal vital activity in a saline environment, in contrast to the original cultures.



Figurre 1. Growth dynamics of nitrogen-fixing strains

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