ISSN: 2776-0960 Volume 2, Issue 4 April, 2021

IMPORTANCE OF EPSS SYNTHESIZED BY MICROORGANISMS IN SOIL SALINITY AND PRODUCTIVITY

Pattaeva Mohichehra Abdusattorovna.
Senior Researcher, Institute of Genetics and Experimental Biology, Academy of Sciences of the Republic of Uzbekistan.
maksudaziz@mail.ru

Rasulov Bakhtiyor Abdugafurovich.
Senior Researcher, Institute of Genetics and Experimental Biology, Academy of Sciences of the Republic of Uzbekistan.

Pattaev Akmaljon Abdusattorovich
Andijan institute of agriculture and agrotechnology independent finder

ABSTARCT

This article analyzes measures to increase productivity based on salt biosorption based on exopolysaccharides synthesized by microorganisms for plant growth and development on soils of different salinity and measures to normalize the growing season and increase productivity based on biologically active substances synthesized by microorganisms. It was analyzed in experiments that microorganisms live in a symbiosis state with the plant, providing them not only with the necessary nutrients, but also with the passage of salts through biosorption in saline conditions, as well as the normalization of the vegetation period of the plant.

Keywords: microorganism, salinity, biosorption, vegetation.

Of particular importance is the role of green plants and micro organism in increasing soil fertility. As you know, one of the negative factors that reduce soil fertility is salinity – salinity. As a result of the salinity of the lands, useful microorganisms in the soil and the plant world are exterminated.

At present, the meliorative state of almost 9,6 percent of the irrigated land in our country is bad, which is primarily due to the high salinity of the soil and the rise in groundwater. Therefore, the further expansion of irrigated arable land areas is one of the most important tasks of today's agriculture to raise productivity by improving their melioration status [1].

The degree of harmfulness of salts in the soil to plants is different, the most harmful and dangerous for them is soda (Na_2CO_3). Soda forms sodium alkali (NaOH) dissolved in water, and this salt has a toxic effect on plants. He cuts off the roots, darkens them, dies. Chlorine salts are also very harmful, and sulphate salts are relatively less harmful. High amounts of hard-soluble salts ($CaSO_4$, $CaCO_3$) are also harmless to plants. In saline soils, the easily soluble salts of sodium and magnesium are more than threeraydi [2].

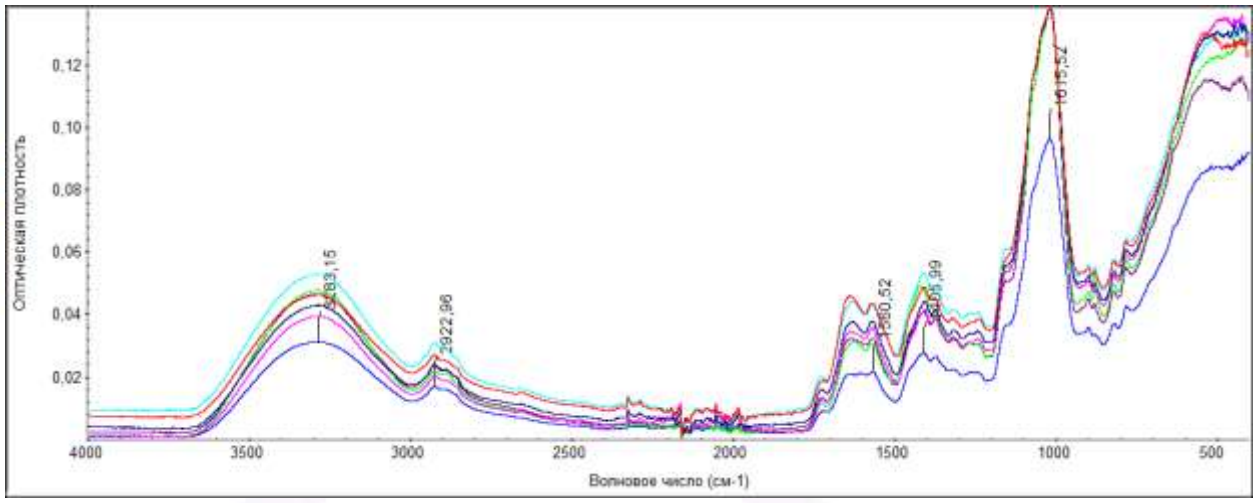
The purpose of the research work is to investigate the measures of biosorption of salts on the basis of exopolysaccharides (EPS) synthesized by microorganisms on soils of varying degrees of salinity, plant growth, development and productivity enhancement on the basis of biologically active substances synthesized by microorganisms. In studies, in conditions of various salt stress the *Rh.radiobacter* 36 shtams have been studied to produce EPS. Salt concentrations were determined as 0.25, 0.5, 1.0, 1.5, 2.0 and 2.5 %. The control variant was grown in a salt-free feed environment. When the cultivation was completed, ferments were inactivated and centrifugated at a speed of 8000 rpm for 5 minutes. The precipitated biomass was calculated by the weight of the drying out. On this basis, the effect of salinity on the biomass of the strain was studied (Table 1).

Table 1 Rh of salinity of different degrees.radiobacter 36 effects of strain biomass

Variants	Biomass weight, g (in dry state)
Control	
Feed environment (saltless)	
0.25 % salt food environment	0.57
0.5 % salt food environment	0.49
1.0 % salt food environment	0.42
1.5 % salt food environment	0.41
2.0 % salt food environment	0.44

As can be seen from experience, this strain is able to grow and develop even at high concentrations of salts.

EPS of the strain grown at different salt concentrations were precipitated and dried at a temperature of 40-45○C, and IR spectra were obtained on the basis of SEM-EDX analysis of EPS samples (Figure 1).



Picture 1. The Rh.radiobacter SEM-EDX analysis of EPS samples generated by different levels of salinity of theobacter 36 shtamms

Relative humidity under normal conditions during the study. *Rh. radiobacter* 36 shtamms studied the properties of biosorption salts from EPS, which is synthesized by. To do this, the biomass of the strain grown in a normal nutrient medium was precipitated in the above order and 100 ml of supernatants were selected, dissolved with the addition of 0.25, 0.5, 1.0, 1.5, 2.0 and 2.5% salt each and left for a day. After being sunk on the day of the ENP, the xar sample was numbered and dried and brought to the ISP-MS instrument. This experiment was used to determine how much Na^+ is present in the samples (table 3).

Table 3. Rh. radiobacter 36 Na^+ absorption of EPS ions synthesized by the stamms

№	Variants	Absorption amount
1	D-K **mg/gr**	173,553315 **1,73553315**
2	D-0.25 **mg/gr**	989,5413088 **9,895413088**
3	D-0.5 **mg/gr**	1570,638448 **15,70638448**
4	D-1 **mg/gr**	2487,187396 **24,87187396**
5	D-1.5 **mg/gr**	4322,467927 **43,22467927**
6	D-2 **mg/gr**	5177,899929 **51,77899929**
7	D-2.5 **mg/gr**	4108,361299 **51,08361299**

The absorption of Na+ EPS ions was maximal in the 2.0 and 2.5% concentration variants. Instead of inference, it can be said that this strain is able to absorb the maximum level of the Na+ ion based on the EPS gel, accompanied by an increase in the salt concentration at higher levels.

At the next stage of research, the effect of biologically active substances synthesized from the shtobacter 36 strain on the fecundity of hemp and common hemp seeds was studied. Inoculation of plant seeds was performed twice in three stages. Initially, the seeds of the "Bardosh" wheat variety *Rh. radiobacter* was innocent for 18 hours with a suspension of 36 strain, using water in the control version. Culture liquids 1:1, 1:1.5, 1:2 and diluted in the proportions of 1:3, and the seeds are fertilized. The number of germinated seeds was calculated (in the seed of 20 pieces, in 2 repetitions) (Table 4).

Table 4 Effect of Rh.radiobacter 36 strain on wheat yield of new Bardosh seeds

Variants	Outgrown seeds,%	Unemployed seeds,%
Control (with water)	80/90	20/10
1:1 (1 мl Cultural fluid +1 мл сув)	85/90	15/10
1:1.5(1 мl Cultural fluid +1.5 мл сув)	90/100	10
1:2 (1 мl Cultural fluid +2 мл сув)	100/100	-
1:3 (1 мl Cultural fluid +3 мл сув)	100/100	-

Table 5 Effect of Rh.radiobacter 36 strain on seed germination of Thermos-31 cotton

Variants	Outgrown seeds,%	Unemployed seeds,%
Control (with water)	80/70	20/30
1:0.5 (1 мl Cultural fluid +0.5 мл сув)	50/60	50/40
1:1 (1 мl Cultural fluid +1мл сув)	50/55	10/45
1:2 (1 мl Cultural fluid +2 мл сув)	60/65	40/35
1:3 (1 мl Cultural fluid +3 мл сув)	100/100	-

It is known from the literature that biologically active substances synthesized by microorganisms act as a stimulant to the plant, as well as act as an inhibitor when given in high doses. This means that the effect of physiologically active substances is very high [3,4]. This was also the case in our experiments. It was found that the strain of Rh.radiobacter 36 is maximal when diluted in a 1: 2 and 1: 3 ratio of culture suspension for wheat varieties “Bardor” and 1: 3 for cotton seeds “Thermos-31”.

In conclusion, the use of culture suspension of Rh.radiobacter 36 strain in the use of saline soils of different levels in agriculture can achieve effective results in increasing crop yields while ensuring both soil fertility and normal growth of plants during the growing season.

References

1. Kholikulov Sh., Uzakov P., Bobokhojaev I - «Soil science», —N.Doba||, T.2013.
2. I. Kurbanov Text of lectures "Microbiology and agricultural biotechnology".
3. Pattaeva M.A., Khamidova X.M., Zuxritdinova N.Yu., Yunusova N.S. Influence of microorganisms on the growth and development of cotton plants. Bulletin of the National University of Uzbekistan, №4 / 2 2013, 256 - 257 p.
4. Zuxriddinova N.Yu. // Mikrobnye roststimulyatory i ix vliyanie na selskoxozyaystvennye kultury // Avtoreferat, 2008