

LABORATORY STUDIES CONCERNING THE MICROBIAL CHARGE OF THE RHIZOSPHERE IN THE MINERAL RELATION OF THE PLANTS

STUDII DE LABORATOR PRIVIND ÎNCĂRCĂTURĂ MICROBIANĂ A RIZOSFEREI ÎN RELAȚIA MINERALĂ A PLANTELOR

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Abstract: *In the present paper we proposed ourselves, the accomplishment of a study concerning the microbial charge at the soya plants (Glycine max L.). We used S2254RR transgenic soya plants and intransgenic ones of Perla variety. The experience was realized in the laboratory, and after the appearance of the second leaf, was determined the colonies number from the plants rhizosphere.*

Rezumat: *În lucrarea de față ne-am propus efectuarea unui studiu asupra încărcăturii microbiene la plantele de soia (Glycine max. L). Am utilizat plante de soia transgenice S2254RR și plante de soia netransgenice din soiul Perla. Experiența s-a montat în laborator, iar după apariția celei de-a doua frunză s-a determinat numărul de colonii din rizosfera plantelor.*

Key words: *microorganisms, rhizoplane, rhizosphere, edaphosphere.*
Cuvinte cheie: *microorganismе , rizoplan, rizosferă, edafosferă.*

INTRODUCTION

Beginning from the observations of the french explorers (Winogradsky S.N., 1949) and the aboriginals who emphasized the fact that the plants with a taxonomical composition of rhizosphere populations totally different and also the fact that the presence and the microorganisms activity in the rhizosphere stimulate the plant growth and ensure a strong development. It is observed that the rhizosphere importance is easily to deduce if we consider that the plant, the soil and the microorganisms compose the rhizosphere level, a true ecological system, whose components are connected between them through the very complex interrelations.

MATERIAL AND METHOD

For the microbial charge determination and pursuing of the rhizosphere we used both transgenic soya plants from S2254RR variety and netransgenic plants from Perla variety which were grown in the laboratory conditions and treated with different nutritional solutions. After a month from the plants arising is determined the colonies number of microorganisms on the different culture averages (Topping an CZPA). The colonies number determination from the plants rhizosphere and edaphosphere are restored in the table 1, and the determined colonies number in the plants rhizoplane and edaphosphere are restored in the table 2.

Table 1

The determined colonies number in the plants rhizosphere and edaphosphere. (UFC/gr)

Specification		PERLA				S 2254 RR				Edaphosphere			
The plant, repetition		Topping	x	CZPA	x	Topping	x	CZPA	x	Wet soil	Ku	dry soil	x
P1	V1	9.366*10 ⁷	31.72*10 ⁷	1.45*10 ⁷	1.38*10 ⁷	109.47*10 ⁷	116.23*10 ⁷	42.36*10 ⁷	26.18*10 ⁷	26*10 ⁵	1.22	31.72*10 ⁵	22.16*10 ⁵
	V2	54.08*10 ⁷		1.31*10 ⁷		41.82*10 ⁷		9.73*10 ⁷		9*10 ⁵	1.40	12.6*10 ⁵	
P2	V1	20.46*10 ⁷	18.7*10 ⁷	2.92*10 ⁷	6.13*10 ⁷	23.68*10 ⁷	40.19*10 ⁷	18.42*10 ⁷	19.9*10 ⁷	4*10 ⁵	1.45	5.8*10 ⁵	6.32*10 ⁵
	V2	16.95*10 ⁷		9.35*10 ⁷		56.7*10 ⁷		21.45*10 ⁷		5*10 ⁵	1.37	6.85*10 ⁵	
P3	V1	23.97*10 ⁷	21.92*10 ⁷	5.26*10 ⁷	7.3*10 ⁷	2.92*10 ⁷	4.36*10 ⁷	17.54*10 ⁷	14.34*10 ⁷	8*10 ⁵	1.32	10.56*10 ⁵	21.78*10 ⁵
	V2	19.88*10 ⁷		9.35*10 ⁷		5.8*10 ⁷		11.15*10 ⁷		11*10 ⁵	1.29	14.19*10 ⁵	
P4	V1	18.17*10 ⁷	19.57*10 ⁷	0.35*10 ⁷	0.26*10 ⁷	182*10 ⁷	190.25*10 ⁷	0.5*10 ⁷	1*10 ⁷	3*10 ⁵	1.22	3.66*10 ⁵	6.73*10 ⁵
	V2	20.97*10 ⁷		0.17*10 ⁷		198.5*10 ⁷		1.5*10 ⁷		7*10 ⁵	1.40	9.8*10 ⁵	
P5	V1	40.16*10 ⁷	48.10*10 ⁷	3.5*10 ⁷	4.1*10 ⁷	3.5*10 ⁷	9.65*10 ⁷	2.5*10 ⁷	3*10 ⁷	15*10 ⁵	1.45	21.75*10 ⁵	21.81*10 ⁵
	V2	56.05*10 ⁷		4.7*10 ⁷		15.8*10 ⁷		3.5*10 ⁷		16*10 ⁵	1.37	21.92*10 ⁵	
P6	V1	67.8*10 ⁷	79.05*10 ⁷	1.2*10 ⁷	1.85*10 ⁷	3.68*10 ⁷	12.52*10 ⁷	0.73*10 ⁷	0.64*10 ⁷	17*10 ⁵	1.32	22.44*10 ⁵	17.02*10 ⁵
	V2	90.3*10 ⁷		2.7*10 ⁷		21.36*10 ⁷		0.55*10 ⁷		9*10 ⁵	1.29	11.61*10 ⁵	
P7	V1	35.4*10 ⁷	38.45*10 ⁷	5.8*10 ⁷	5.06*10 ⁷	4.01*10 ⁷	12.68*10 ⁷	0.73*10 ⁷	0.73*10 ⁷	11*10 ⁵	1.22	13.42*10 ⁵	8.11*10 ⁵
	V2	41.5*10 ⁷		4.33*10 ⁷		21.36*10 ⁷		0.73*10 ⁷		2*10 ⁵	1.40	2.80*10 ⁵	
P8	V1	13.3*10 ⁷	19*10 ⁷	2.94*10 ⁷	4.37*10 ⁷	2.91*10 ⁷	2.54*10 ⁷	1.45*10 ⁷	5.09*10 ⁷	8*10 ⁵	1.45	11.6*10 ⁵	14.7*10 ⁵
	V2	24.7*10 ⁷		5.8*10 ⁷		2.18*10 ⁷		3.64*10 ⁷		13*10 ⁵	1.37	17.81*10 ⁵	

The P1,P2,P3,P4 plants belong to the Perla classical variety, and the P5, P6, P7, P8 plans belonging to the S2254 variety.

Table 2

The determined colonies number in the plants rhizosphere and edaphosphere. (UFC/gr)

Specification		PERLA				S2254RR				Edaphosphere			
The plant, repetition		Topping	x	CZPA	x	Topping	x	CZPA	x	Wet soil	Ku	dry soil	x
P1	V1	73,04*10 ⁷	76,94*10 ⁷	2,83*10 ⁷	1,41*10 ⁷	10,34*10 ⁷	12,92*10 ⁷	6,8*10 ⁷	4,26	26*10 ⁵	1,22	31,72*10 ⁵	22,16*10 ⁵
	V2	80,85*10 ⁷		0*10 ⁷		15,51*10 ⁷		1,72*10 ⁷		9*10 ⁵	1,40	12,6*10 ⁵	
P2	V1	2,42*10 ⁷	3,03*10 ⁷	2,02*10 ⁷	2,22*10 ⁷	44*10 ⁷	45*10 ⁷	19*10 ⁷	26,5	4*10 ⁵	1,45	5,8*10 ⁵	6,32*10 ⁵
	V2	3,64*10 ⁷		2,42*10 ⁷		46*10 ⁷		34*10 ⁷		5*10 ⁵	1,37	6,85*10 ⁵	
P3	V1	4,04*10 ⁷	4,85*10 ⁷	4,04*10 ⁷	3,84*10 ⁷	15*10 ⁷	20,5*10 ⁷	5*10 ⁷	4	8*10 ⁵	1,32	10,56*10 ⁵	21,78*10 ⁵
	V2	5,66*10 ⁷		3,64*10 ⁷		26*10 ⁷		3*10 ⁷		11*10 ⁵	1,29	14,19*10 ⁵	
P4	V1	11,25*10 ⁷	11,25*10 ⁷	2,5*10 ⁷	1,87*10 ⁷	27,7*10 ⁷	22,18*10 ⁷	8,33*10 ⁷	15,27	3*10 ⁵	1,22	3,66*10 ⁵	6,73*10 ⁵
	V2	21,25*10 ⁷		1,25*10 ⁷		16,66*10 ⁷		22,22*10 ⁷		7*10 ⁵	1,40	9,8*10 ⁵	
P5	V1	35,35*10 ⁷	31,24*10 ⁷	3,81*10 ⁷	4,15*10 ⁷	41,66*10 ⁷	33,33*10 ⁷	5,1*10 ⁷	6	15*10 ⁵	1,45	21,75*10 ⁵	21,81*10 ⁵
	V2	27,14*10 ⁷		4,5*10 ⁷		25*10 ⁷		6,9*10 ⁷		16*10 ⁵	1,37	21,92*10 ⁵	
P6	V1	51,12*10 ⁷	62,12*10 ⁷	1,5*10 ⁷	1,6*10 ⁷	15,66*10 ⁷	12,04*10 ⁷	3,61*10 ⁷	3,61	17*10 ⁵	1,32	22,44*10 ⁵	17,02*10 ⁵
	V2	73,13*10 ⁷		1,7*10 ⁷		8,43*10 ⁷		3,61*10 ⁷		9*10 ⁵	1,29	11,61*10 ⁵	
P7	V1	35,16*10 ⁷	36,08*10 ⁷	8,68*10 ⁷	8,84*10 ⁷	19,27*10 ⁷	15,65*10 ⁷	3,61*10 ⁷	6,02	11*10 ⁵	1,22	13,42*10 ⁵	8,11*10 ⁵
	V2	37,00*10 ⁷		9,01*10 ⁷		12,04*10 ⁷		8,43*10 ⁷		2*10 ⁵	1,40	2,80*10 ⁵	
P8	V1	14,5*10 ⁷	10,05*10 ⁷	3,4*10 ⁷	3,3*10 ⁷	27,08*10 ⁷	64,58*10 ⁷	3,01*10 ⁷	1,04	8*10 ⁵	1,45	11,6*10 ⁵	14,7*10 ⁵
	V2	5,6*10 ⁷		3,2*10 ⁷		102,08*10 ⁷		2,08*10 ⁷		13*10 ⁵	1,37	17,81*10 ⁵	

The P1,P2,P3,P4 plants belong to the Perla classical variety, and the P5, P6, P7, P8 plans belonging to the S2254 variety.

After the calculations was emphasized the fact that the microorganisms were developed better also in many colonies an Topping average both in the classical varieties case and in the transgenic varieties case. It appears negative differences between Topping and CZPA averages at the Perla variety and the S2254RR variety both at the determined colonies number in the rhizosphere and in the soya plants rhizoplane.

Insignificant differences appear between the soya varieties for the determined colonies number in the rhizosphere and the plants rhizoplane ou Topping and CZPA average.

After the calculations, were emphasized insignificant differences between the soya variants for the determined colonies number in the plants rhizosphere and phizoplane.

Edaphosphere presents a reduced number of microorganisms comparative with the transgenic plants rhizoplane and rhizosphere and also of the intransgenic plants.

CONCLUSIONS

The transgenic plants develop in the rhizosphere a bigger number of microorganisms than intragenetic the ones.

The Topping average encourages the development of a bigger number of rhizospherical bacteria comparative with CZPA average.

In the edaphosphere the microorganisms number is more reduced than in the rhizoplane and rhizosphere of the genetical modified plants and of the genetical nomodified plants.

LITERATURE

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