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THE CUMULATIVE INFLUENCE OF CYTOKININS AND AUXINE ON SOYBEAN PLANTS FORMATION " *IN VITRO"* CULTURS

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Abstract

In vitro regeneration and organogenesis at some species of plants is an essential condition to accomplish vegetative multiplication. In our study auxines and cytokinins were used for making the culture medium more effective. The nature of the phytohormones used, and also their concentration, the differences of the hormonal balances have an important role in the organogenesis processes.

Key words: soybean,, organogenesis, cytokinins, phytohormons,auxines,hormonal balance ;

INTRODUCTION

In vitro techniques make it possible to easily implement treatment with mutagenic agents on a large number of tissues and cells.

Phytohormones are organic compounds which in low concentrations, or very small, stimulate, inhibit or modify plant growth and development.

Soybean is one of the plants that presents a high plasticity of the response to stimuli mutagens, its regeneration can be achieved by forming the bipolar structure of cotyledons and his roots (CORNEANU, 1989).

The physiological effect of auxin and cytokinins combined that constitute the so-called hormonal balance, determine a control plant hormones of organogenesis, demonstred by differentiation the roots and stems (CACHIŢA-COSMA şi colab., 2004; CACHIŢA-COSMA şi Camelia SAND, 2000; RAICU şi colab., 2000) .

SKOOG şi MILLER (1957), founded the concept of plant hormones control of organogenesis, demonstrating experimental the fact that his roots and stems differentiation in vitro plantlets are, for dependence ratio is auxin / cytochinin, in the environment.

For *in vitro* cultivation of cells and tissues are used auxins, cytokinins and gibberellins less. The main auxine are - the core of the indolyl - 3-indolilacetic acid (AIA) indolilbutiric acid (AIB) and indolylpropionic acid (AIP) and the nucleus naphtalicacidanhydride, 1-naphthylacetic acid (ANA) and naphthoxyacetic acid (ANOA) (BOXUS şi colab., 1995).

MATERIAL AND METHODS

In our study we used cultivars of soybean: Diamond, Pearl and Agate introduced into the culture medium Murashige-Skoog (1962).

Auxins used to induce cell division and rootedness process were acid indolilacetic (AIA), acid indolilbutiric (AIB) and alpha-naphthylacetic acid (ANA) in a concentration of 0.5-2.0 mg / l.

Used cytokinins were kinetin (K) (6-furfuryl-aminopurine) and BAP (6-benzyl-aminopurine).

The existence in culture medium increased concentrations of auxin, cytokinins with stimulates rootedness processes, while increasing the amount of cytokinins to stimulate the growth bud formation and the generation of strain. In the presence of high concentrations, but equal, the said compounds can be triggered, with the process of morphogenesis, and generating callus and its growth.

In the present experiment sequence were highlighted aspects of regenerative ability and in vitro multiplication apex node, and soybean pod, depending on hormonal balance.

The activity of the auxin is dependent on the type of tissue subject to the action thereof, the nature and concentration of auxin and there is phenophase the plant. It was found that the roots are more susceptible to the administration of low concentration, while the stems and leaves in higher react, typically in association with cytokinins. The difference in response to treatments with auxin, which exists in the selective responsiveness of the explants depends largely on the genotype.

In the process of organogenesis soybean explain the necessity of their presence in Murashige-Skoog nutrient medium, because in all cases it was found that the transition explant culture medium base without the participation of organogenesis growth hormone does not fire.

RESULTS AND DISCUSSION

It was pointed out that in the absence of cytokinins and also of auxin, cell division is not done. In the individual presence to their

environment the culture, it highlights the processes of organogenesisis on a particular tier of developing seedlings soy.

Table 1 shows the effects of the introduction of kinetin the basic culture (K) and auxin (AIA, AIB, ANA), in the proportions mentioned, the organogenesis soybeans process. From the data emerges combinations favorable effect of kinetin and auxin in the sense of favoring organogenesis process, but may notice some differences to the response by genotype, variety Agat responded with the most favorable combinations listed in hormonal balance.

Tabel 1

Cumulative effect of phytohormones on soybean organogenesis

Cultivar	***Variant***	***No differences***	***Calusogenesis***	***Risogenesis***	***Caulogenesis***
Diamant	K+AIA	56,6	**39,8**	27,0	**52,0**
	K+AIB	**62,2**	**37,0**	24,6	47,6
	K+ANA	54,8	32,4	**28,0**	45,8
	K+AIA+AIB+ANA	35,4	32,4	**29,4**	50,6
Perla	K+AIA	57,4	**40,8**	25,6	**50,6**
	K+AIB	58,6	37,6	24,2	47,4
	K+ANA	50,6	34,6	**30,2**	42,6
	K+AIA+AIB+ANA	40,0	34,0	**29,6**	48,8
Agat	K+AIA	49,8	**42,9**	27,9	**52,8**
	K+AIB	55,2	40,3	27,1	49,8
	K+ANA	50,7	35,4	**31,5**	45,9
	K+AIA+AIB+ANA	35,5	37,6	**32,7**	51,8

Establishing different hormonal balances and proove at organogenous differences (caulogenesis-rootedness) leads to the conclusion that the most efficiency formula is the combination K + AIA. In terms of recommended concentrations, it is noticed, in all variants, doses of 1.0-1.5 mg/l stimulators are most favorable to the onset of organogenesis soybeans.

CONCLUSIONS

It can be concluded that presence in the culture media of increasing concentrations of auxin in conjunction with the cytochinins, stimulate the

rootendness processes, while a value will increase the content of the cytochinins stimulate the formation of buds, their growth and the generation of strain. Are noticed, also, that presence in the culture medium of equal concentrations of the compounds with auxin and cytochinin can boost - in conjunction with the morphogenesis process - both the generation of callus and its growth.

The success of the explants in vitro plant cultivation depend to a large extent on the realization of the nutritional composition which meets the requirements vital tissues inoculated to compensate for the lack of the most important endogenous factors upon which the existence of the cells in question is embedded in the body plant(CACHIŢA-COSMA şi SAND, 2000).

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