

INFLUENCE OF ALPHA NAPHTHYL ACETIC ACID (ANA) ON *IN VITRO* SOYBEAN GENESIS AND GROWTH

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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 experiments auxines and cytokinins were used for making the culture medium more effective. The auxines used in order to induce the cellular division process and the root formation process were the naphthyl-acetic acid (ANA)

Key words: soybean, naphthyl-acetic, auxines, organogenesis,

INTRODUCTION

In plants, phytohormones and phyto regulators are organic compounds in low concentrations or very small, stimulate, inhibit or modify - qualitatively and quantitatively - the growth and development of plants . Phyto regulators or organic chemical regulators, which influence plant growth and development are synthetic compounds that "mimic" effects of phytohormones, and have a big practical importance in plant biotechnology (DORINA CACHIȚA-COSMA și colab., 2004).

The neogenesis of an organism is a phenomenon that calls the non-operation of numerous physiological processes leading to the mitotic activity by which a meristematic cell acquires the ability to divide again (BIGOT, 1980).

For *in vitro* cultivation of cells and tissues are used auxins, which intervene in many physiological processes and interact with different endogenous substances, particularly with other phytohormones and especially with cytokines, gibberellins and ethylene (BOXUS și colab., 1995).

MATERIAL AND METHODS

For inducing cell division and risogenesis, it was used auxinic alpha naphthyl acetic acid (ANA), with a concentration of 0.5 to 2.0 mg / l.

Physiological action of auxins on plants, although very complex can be summarized to the fact that acts on the increase in length of the cells; it permeabilisate the plasma membranes for water and ion, with cytokine, auxins stimulate cellular division, net rhyzogene action(după CACHIȚA-COSMA și colab., 2004).

The interaction of hormones used in the culture environment and their concentration on *in vitro* multiplication of soybean cultivars determines significant differences in plant neogenesis rates. At low concentrations, physiological stimulative, the auxins provide a favorable growth action; in higher concentrations, they can produce an inhibitory effect or may even be toxic.

In vitro meristematic cells continue their work or resume their mitotic activity. Differentiated cells, stimulated by growth hormones, added in the culture environment dedifferentiation and acquire the ability to divide. This dedifferentiation is specific for *in vitro* cultures (ELENA BADEA și colab., 2001; SAVATTI și colab., 2003).

In order to highlight this aspect, growth hormones were used on the Murashige-Skoog (1962) culture environment and the hormones contribution on neogenesis of *in vitro* plantlets was studied.

This experiment studies the alpha naphthyl acetic acid (ANA) influence on calusogenesis and risogenesis within the three soybean cultivars, Diamond, Pearl and Agate, introduced in the Murashige-Skoog (1962) environment

RESULTS AND DISCUSSION

It is found that naphthyl-acetic acid has a positive influence mainly on calusogenesis, unlike the other two auxines used in previous experiments. Under the influence of this auxine it is found also a process, rather modest, of differentiation the caulogenesis at the level of the three cultivars (tabel 1).

Tabel 1

Influence of naphthaleneacetic acid (NAA) on organogenesis of soybean neoplantules from apical meristeme

<i>Cultivar</i>	<i>ANA/NAA (mg/l)</i>	<i>Evolution of organogenesis %</i>			
		<i>No development</i>	<i>Calusogenesis</i>	<i>Risogenesis</i>	<i>Caulogenesis</i>
Diamant	0,0	100,0	0	0	0
	0,5	26	56	55	0
	1,0	26	64	70	3
	1,5	30	68	66	6
	2,0	38	65	60	2
	3,0	46	18	19	0
	%	33,2	54,2	54,0	2,2
Perla	0,0	100,0	0	0	0
	0,5	23	40	63	0
	1,0	32	42	60	7
	1,5	30	42	68	3
	2,0	30	36	53	3
	3,0	49	12	20	1
	%	32,8	34,4	52,8	2,8
Agat	0,0	100,0	0	0	0
	0,5	30	55	50	1
	1,0	36	65	50	3
	1,5	42	78	46	9
	2,0	48	70	45	3
	3,0	56	15	21	2
	%	42,4	46,6	42,4	3,6
$\bar{X}$ /genotip		36,1	48,4	49,7	2,9

In the case of Agat cultivar, at a concentration of 1.5 mg / l NAA is realized a rate of 9% caulogenesis, obviously superior to the other two cultivars. Under the influence of the phytohormones calusogeneza and rootedness are the most favored, fact found, actually and in the case AIA and AIB.

It is found at Diamonds cultivar a caulogenesis that range from 18-68%, rootedness between 19-70%, caulogenesis of 2.2%, while the genotypes Pearl and Agate, the first two processes (caulogenesis and rootedness) are inferior, but superior in terms of caulogenesis (CHIRILEI și colab., 1970; BANDICI, 2001).

CONCLUSIONS

Analyzing the effects of synthetic auxins on soybean ontogeny, it is noticed that the reaction is different according to their percentage depending on the genotype analyzed. This fact makes us believe that the in vitro

multiplication process of soy, individualization of process must be profound in the sense that each cultivar has its specific profile of reactions to the hormonal activity and as such appears the need for each genotype to individualize the structure of culture environments. This aspect appears pregnant when it is made the behavioral comparison of analyzed genotypes.

It is found obvious that auxins have an effect of induction of rootedness and calusogeneza and amplification of the phenomenon with increasing concentration. In the case experiments conducted is found that in low concentrations auxine induce the formation radicle and with increasing the concentration stimulates the callusing. Caulogenesis is extremely modest stimulated, instead cytokine clearly contribute to the direct organogenesis and formation of multiple shoots (CACHIȚA-COSMA și SAND, 2000)..

The results obtained make us recommend using moderate auxins as well as adenine sulphate addition in the base, enrolling in the recommendations made (GAMBORG și colab. 1968).

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