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INFLUENCE OF 6-BENZYLAMINOPURINE (BAP) ON ORGANOGENESIS AND GROWES OF SOYBEAN *IN VITRO*

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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 BAP were used for making the culture medium more effective.

Key words: soybean, benzylaminopurin, organogenesis, cytokinin, phytohormons

INTRODUCTION

In plants, phytohormones and phytoregulators are organic compounds which if in low or very small concentrations stimulate, inhibit or modify - qualitatively and quantitatively – the plant growth and development.

Of great importance there are the studies on the links and interdependency set between different tissues and cells in relation to the phytohormones administered, but also finding intuitively the paths through which one can interfere from within or outside the cells and tissues of the plant in order to dismantling the inhibition of plant growth and development in generally, and vitro cultures specifically.

Although very complex, the physiological action of cytokinins on plants can be summarized as follows: they trigger the increase of cell length; make the plasma membranes permeable to water and certain ions; are incentives for protein synthesis and synthesis of ribosomal RNA; stimulate the Cellular Division; they are also involved in establishing a correlation between organs, especially in the phenomenon of apical dominance; induce net rhyzogene action; inhibit the formation of somatic embryos in cell suspensions (CACHIŢA-COSMA and collaborators , 2004)..

For soybeans, the induction of *in vitro* mutations is a frequently used method to develop genetic variability that prevails in many breeding programs (CLARA SEBÖK, 1968; ARDELEAN, 1979).

In order to highlight the behaviour of the soybean biological material which was available to us we initiated a series of experiments to determine the most important explants source, plant media culture (MS = Murashige-

Skoog, B_5 = Gamborg-Miller-Okima, LS = Linsmaier-Skoog) and the use of different growth regulators.

In order to make the plant culture media more efficient, we used in our experiments synthesis cytokinin BAP (6-benzylaminopurine).

MATERIAL AND METHODS

If we compare the genotypes analyzed, clear differentiation occur between cultivars belonging to the same genotype, i.e. there are differences between varieties "Agat" (*Agate*), "Perla" (*Pearl*) and "Diamant" (*Diamond*). Whether neoplantlets are formed from meristems stems or coronary stems, the *Agate* and *Diamond* cultivars exhibit increased growth capacity as against to *Pearl* variety.

The source of vitroplantlets marks the growth rate depending on the nature of meristems donor plants and being influenced by the plant culture media on which they develop, which is obvious in the case of Linnsmaier-Skoog (LS) culture medium, with meristems from the crown of plant.

In this study we aimed to go in depth with the role of 6-benzylaminopurine (BAP) cytokinin on the development of soybean plants obtained *in vitro* from the apex, node, floral bud and juvenile pods monitoring the regenerative capacity, organogenesis and multiplication of these explants depending upon the nature of cytokinin, its concentration and the other components within the hormonal balance.

Under these conditions, cytokinins - combined with ANA (Naphthaleneacetic acid) and $AdSO_4$ *(*Adenine sulphate) - introduced in the basic medium MS (Murashige-Skoog) as in table 1.

Table 1

Experimental hormonal balance for soybean meristems

Variant	*Basal medium*	*Cytokinines*	*Concentration* (mg/l)	*Auxines*	*Concentration* (mg/l)	*Addition* $AdSO_4$ (mg/l)
T_1	MS	BAP	1,0	ANA	0,5	40
T_2	MS	BAP	2,0	ANA	1,0	80

RESULTS AND DISCUSSION

BAP (6- Benzylaminopurine) has a direct influence, especially on caulogenesis and calusogenesis and less on rootedness process which are specific effects of cytokinins. The impact of BAP' soybean varieties organogenesis can be noticed in table 2.

Table 2.

Influence of 6- benzylaminopurine (BAP) on organogenesis of soybean neoplantules from apical meristeme

Cultivar	BAP (mg/l)	*Evolution of organogenesis %*			
		No development	*Calusogenesis*	*Risogenesis*	*Caulogenesis*
Diamant	0,0	100,0	0	0	0
	0,5	70	18	0	18
	1,0	68	20	2	45
	1,5	48	21	3	51
	2,0	39	16	2	36
	3,0	75	7	0	16
	%	60,0	16,4	1,4	33,2
Perla	0,0	100,0	0	0	0
	0,5	61	12	0	20
	1,0	76	22	0	50
	1,5	70	22	2	46
	2,0	62	17	3	32
	3,0	76	8	0	9
	%	69,0	16,2	1,0	31,4
Agat	0,0	100,0	0	0	0
	0,5	60	20	0	17
	1,0	60	22	1	46
	1,5	53	23	3	58
	2,0	58	15	3	47
	3,0	70	6	0	18
	%	60,2	17,2	1,4	37,2
$\overline{X}$ **/genotyp**		**63,1**	**16,6**	**1,3**	**33,9**

In contrast to the effects caused, in the case of BAP use in the nutrient medium, one cannot notice major genotypic differences in terms of the organogenesis phenomenon. We notice an increase in the phenomenon of organogenesis in concentrations from 1.0 to 2.0 mg/l, materialized especially in the caulogenesis phenomenon. By making a comparison of the effects of the presence of other cytokinins and BAP in the culture medium, it is noticed that BAP outcome is less positive than in the case of kinetin for example.

CONCLUSIONS

The data presented in the study highlighted that in the absence of the cytokinins, the Cellular division process is not carried out. In the individual presence of the cytokinins, organogenesis processes are highlighted in the culture medium on a particular tier of development of soybean seedlings.

The literature (CACHIŢA-COSMA and collaborators, 2004; CACHIŢA-COSMA and Camelia SAND, 2000; RAICU and collaborators, 2000) uses the notion of ***hormonal balance*** highlighting the cumulative physiological effect of auxins and cytokinins, (SKOOG and MILLER ,1957) established the phytohormones control of organogenesis process demonstrating experimentally the fact that the small roots and strains of seedlings *in vitro* is dependent upon of auxins / cytokinins ratio present in the culture medium.

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