THE INFLUENCE OF β-INDOLYL-BUTYRIC ACID (IBA) AND OF β-INDOLYL-ACETIC ACID (IAA) ON THE FORMATION AND DEVELOPMENT OF BIRD'S FOOT TREFOIL PLANTS

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Abstract

The paper presents the influence of β-indolyl-butyric acid (IBA) and of β-indolyl-acetic acid (IAA) in mg/l on callusogenesis, rhizogenesis and caulogenesis in bird's foot trefoil, Alina cultivar.

Adding β-indolyl-butyric acid (IBA) to the Murashige-Skoog culture medium shows that organogenesis evolution expressed in percentage has the highest values when using a concentration of 1.5-2 mg/l. The experiment has also shown that in the case of bird's foot trefoil, IBA has an effect mainly on the rhizogenesis process when concentrations of 0.5-2 mg/l are used. As far as callusogenesis is concerned, different results could be noticed based on the concentration of the β-indolyl-butyric acid in the medium.

Concerning the phenomena of callusogenesis and rhizogenesis in the Alina cultivar, different percentages were obtained depending on the hormone concentration. However, when looking at these results, it should be taken into account that there was a very high percentage of explants, 48.0-56%, without development.

The influence of IAA (β-indolyl-acetic acid) on the organogenesis process shows somehow similar results with IBA. The only difference was that in the case of the Murashige-Skoog culture medium adding different concentrations of IAA had no effect on caulogenesis. The optimum results in the rhizogenesis and the callusogenesis processes are obtained with concentrations of 1.0-1.5 mg/l.

Key words: β-indolyl-butyric, β-indolyl-acetic, bird's foot trefoil, callusogenesis, caulogenesis, rhizogenesis.

INTRODUCTION

In order to make the culture media more efficient, auxins were used. The two auxins used in this experiment to induce cell division and rhizogenesis were indolyl-acetic acid (IAA) and indolyl-butyric acid (IBA), with concentrations of 0.5-2 mg/l. As a result of stimulation by the growth hormones added to the culture medium, differentiated cells dedifferentiate and acquire the capacity to divide. Cellular dedifferentiation is a capacity specific to plants (Dragomir N., 1998; Badea Elena Marcela, Daniela Săndulescu, 2001; Savatti M., et al., 2003).

MATERIAL AND METHOD

β-indolyl-butyric acid (IBA) was added to the Murashige-Skoog culture medium, in concentrations that varied between 0.5-2 mg/l. The same method was used in the case of indolyl-acetic acid (IAA).

RESULTS AND DISSCUSIONS

β-indolyl-butyric acid (IBA) in mg/l has an influence on callusogenesis, rhizogenesis and on caulogenesis in the Alina cultivar of bird's foot trefoil. When a concentration of 1.5-2 mg/l is used, organogenesis evolution can be noticed.

The effect of IBA on organogenesis in bird's foot trefoil can be noticed mainly on the rhizogenesis process, when concentrations of 0.5-2 mg/l are used. In the case of callusogenesis, different results can be noticed based on the concentration of the β-indolyl-butyric acid in the medium (Table 1).

Table1

The influence of β-indolyl-butyric acid (IBA) upon organogenesis in Bird's-foot trefoil, Alina cultivar, plantlets obtained from apical meristems

Cultivars	IBA (mg/l)	Organogenesis evolution %			
		Without development	Callusogenesis	Rhisogenesis	Caulogenesis
Alina	0.0	100.0	0	0	0
	0.5	48.0	8.0	34.0	0
	1.0	50.0	12.0	36.0	2
	1.5	56.0	8.0	42.0	4
	2.0	50.0	10.0	39.0	3

Concerning the organogenesis process, the reaction of the cultivar to the influence of IAA (β-indolyl-acetic acid) is almost the same as to IBA. The only difference is that adding IAA to the Murashige-Skoog culture medium in various concentrations does not have any effect on the caulogenesis process. The optimum results in the rhizogenesis and the callusogenesis processes are obtained with concentrations of 1.0-1.5 mg/l (Table 2).

Table2

The influence of β-indolyl-acetic acid (IAA) upon organogenesis in Bird's-foot trefoil, Alina cultivar, plantlets obtained from apical meristems

Cultivars	IAA (mg/l)	Organogenesis evolution %			
		Without development	Callusogenesis	Rhisogenesis	Caulogenesis
Alina	0.0	100.0	0.0	0.0	0
	0.5	63.0	8.0	18.0	0
	1.0	50.0	15.0	23.0	0
	1.5	52.0	14.0	28.0	0
	2.0	60.0	5.0	30.0	0

CONCLUSIONS

As mentioned above, caulogenesis has no evolution when IAA is used, unlike the effect of IBA, where, in the case of high concentrations, the cultivars reacted in a modest way, with certain differences in the values. In the case of rhizogenesis, the best evolution was obtained for higher concentrations (2.0 mg/l).

The data obtained confirm the findings reported in the scholarly literature, that is, AIB and IAA auxins have visible effects in triggering rhizogenesis. It seems that as far as *in vitro* cultures are concerned, at least in the case of bird's foot trefoil, there is a negative correlation between rhizogenesis and callusogenesis, on the one hand, and the caulogenesis process, on the other hand.

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