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Реализира Македонска Трибина - Скопје
(тираж 500)

**THE EFFECT OF SOME CYTOKININS ON PEPPER ORGANOGENESIS
(*Capsicum annuum* L. c.v. KURTOVSKA KAPIJA AND ZLATEN MEDAL)
CULTURED IN VITRO**

Koleva-Gudeva Liljana¹ and Spasenoski M.²

2001, Sani-Halkidiki, Greece, 1st International Symposium on `Acclimatization and Establishment of Micropropagated Plants. (p. 119 Abstract)

Abstract

In this paper are summarized some experimental results concerning the effect of some cytokinins on organogenesis and regeneration of pepper explants (apical buds) cultured in vitro. Two cultivars of pepper (*Capsicum annuum* L.) were used as experimental material cv. Kurtovska kapija, a red sweet and c.v. Zlaten medal, red sweet type. The two types are highly popular in the R. of Macedonia, c.v. Kurtovska kapija is extensively grown in the southeaster region, while Zlaten medal is also present in the northeaster part in Macedonia. The meristematic explants were isolated from aseptically grown seedlings, than they were cultivated on MS medium (Murashige and Skoog 1962). The effect of cytokinins KIN, BAP and ZEA applied in medium alone or with combination of auxins IAA and NAA was examined. After 40 days we measured the percentage of callus formation, leaf rosettes formation and root formation. Depending on the concentration of cytokines and their combination with auxins, the percentage of callus formation, leaf rosettes formation and root formation, was different for different combinations. The best results for organogenesis and regeneration on the both types of pepper were shown on the medium with ZEA. For all examined mediums there was noticed a slight difference between sorts Kurtovska kapija and Zlaten medal, on the organogenesis and regeneration effect.

Key words: **organogenesis, shoot culture, ZEA, BAP, KIN, IAA, and NAA.**

**ЕФЕКТОТ НА НЕКОИ ЦИТОКИНИНИ ВРЗ ОРГАНОГЕНЕЗАТА НА
ПИПЕРКА (*Capsicum annuum* L. сорти КУРТОВСКА КАПИЈА И ЗЛАТЕН
МЕДАЛ) ВО УСЛОВИ IN VITRO**

Koleva-Gudeva Liljana¹ i Spasenoski M.²

**2001, Сани-Халкидики, Грција, 1 Меѓународен симпозиум за
Акклиматизација и Поставање на Микропропагиран растенија (стр. 119)**

Краток извадок

Во овој труд даден е краток преглед на експерименталните резултати од ефектот на некои цитокинини врз органогенезата и регенерацијата на

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експлантати од пиперка во *in vitro* услови.

Како експериментален материјал беа користени две сорти на пипека (*Capsicum annuum L.*) Куртовска капија црвана слатка и Златен медал исто така црвена слатка. И двете сорти се одгледуваат во Р. Македонија, Куртовската капија е посебно популарна во југоисточниот а Златниот медал е присутна и во североисточниот дел на Р. Македонија. Меристемски експлантати беа изолитани од асептички исклиени семиња од пиперка, а потоа беа култивирани на MS медиум (Murashige and Skoog 1962). Беше испитуван ефектот на цитокинините KIN, BAP и ZEA во медиумот, со и без присуство на ауксините IAA и NAA. По 40 дена беа извршени мерења за процентот на формирање на лисни розети, калус и корени.

Во зависност од концентрацијата и комбинацијата на ауксините, процентот на формирањето на лисни розети, калус и корени беше различен за различни хормонски комбинации и концентрации. Најдобри резултати врз органогенезата и регенерацијата и кај двете сори дадоа медиуми со присуство на ZEA. За сите испитувани медиуми беше забележана сосема мала разлика меѓу сортите Куртовска капија и Златен медал за ефектот на органогенезата и регенерацијата во услови *in vitro*.

Клучни зборови: органогенеза, култура на изданоци, ZEA, BAP, KIN, IAA, и NAA.

1. Introduction

The region of Strumica is mainly agricultural oriented, so our interest for *in vitro* culture is on the vegetable crops, especially pepper. The target cultivars are pepper c.v. Kurtovska Kapija and c.v. Zlatan medal which as genetically unstable, and our aim is to produce more uniform population. The both types are highly popular in R. of Macedonia, c.v. Kurtovska kapija is extensively grown in the southeaster region, while Zlatan medal is also present in the northeaster part in Macedonia.

In pepper, based on organogenesis of different explants, several tissue culture protocols have been described (Phillips and Husbstenberger 1985; Agrawal et al. 1989; Ochoa-Alejo and Ireta-Moreno 1990; Arroyo and Revilla 1991; Valeria-Montero and Ochoa-Alejo 1992; Ebidia and Hu 1993; Hari and Andrasfalvy 1994).

In these study parameters such as percentage of callus formation, leaf rosettes formation and root formation were studied in order to find the effect of some cytokinines on the organogenesis on pepper shoots.

2. Material and Methods

Apical buds of pepper were isolated from aseptically grown seedlings. The seeds were washed 15 sec in 70% alcohol, stirred 10 min in 1% Izosan, then stirred 15 min in Na-hipochloride and rinsed twice in sterilized distilled water.

Apical buds were trimmed to 0,3 cm in length and were cultivated in a modified Murashige - Skoog medium containing ZEA, BAP, KIN, IAA, NAA in different combinations and concentrations. The medium also contained 200 mg/l casein hydrolysate, 100 mg/l inositol and 7g/l agar (pH 5,8).

Cultures were held at primary growth room under illumination of 2 000 - 3 000 Lux, photoperiod 16/8 light/dark, 25±1°C temperature and relative humidity of 80%.

3. Results and discussion

On the MS medium with cytokinines BAP or KIN and presence of auksin IAA it was noticed leaf rosettes formation on the both sorts Kurtovska kapija and Zlaten medal. On the medium 0,5 mg/l IAA + 1,0 mg/l BAP (Table 1) leaf rosettes formation on Zlaten Medal is 47,08% while on the same medium on the sort Kurtovska kapija is only 9,52%.

At the other exanimate mediums the presence of leaf rosetes formation is biggest on Zlaten medal, which is confirmation that the ability for organogenesis and regeneration is less on the Kurtovska kapija than on the Zlaten medal. Increasing the concentration on BAP on the medium, with the constant presence of NAA 0,5 mg/l, is followed by increasing of the presence of forming the leaf rosettes.

Comparing the effect of cytokinines BAP and KIN, on the organogenesis of apical bud of pepper, is remarkable that BAP has the bigger effect than the KIN. On the both exanimate sorts it is noticed that on the medium only with cytokinines the presence of leaf rosettes formation is largest. Callus formation decreasing and the leaf rosettes formation is even 100% for the very small concentrations on cytokinines, for example on the MS + 0,5% ZEA.

From the all exanimate cytokinines, KIN showed the lowest effect (Table 2). On the MS + 0,5 mg/l KIN and MS + 1,0 mg/l KIN the leaf rosettes formation is absent.

4. Concluding remarks

The effect of ZEA (Figure 1) on organogenesis and regeneration of pepper explants, for both cultivars Kurtovska kapija and Zlaten medal, was the most efficient of the other used cytokinines in the medium. The less was the effect of BAP and even less of the KIN for the both sorts of pepper.

On the all exanimate mediums, the sort Zlaten medal shows slightly bigger effect for organogenesis and regeneration than the sort Kurtovska kapija.

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Figure 1. The effect of cytokinines on the leaf rosettes formation on pepper explants.

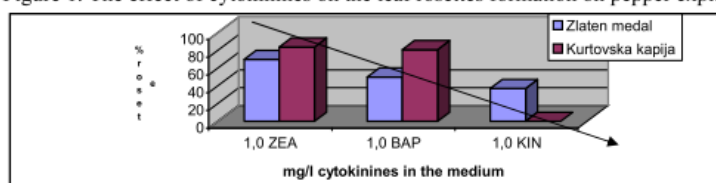


Table 1. Isolated apical buds from pepper on MS medium, including: BAP, KIN, IAA and NAA, after 40 days.

ZLATEN MEDAL		
MS medium mg/l	Leaf rosettes %	Callus %
0,5 IAA + 1,0 BAP	47,08	88,23
0,5 IAA + 1,0 KIN	11,76	64,70
1,0 IAA + 1,0 KIN	6,66	20,00
0,5 NAA + 1,0 BAP	42,85	50,00
0,5 NAA + 2,5 BAP	48,50	42,85
0,5 NAA + 5,0 BAP	50,00	44,44
0,5 IAA + 10,0 BAP	55,55	33,33
KURTOVSKA KAPIJA		
MS medium mg/l	Leaf rosettes %	Callus %
0,5 IAA + 1,0 BAP	9,52	66,60
0,1 IAA + 2,0 BAP	9,70	16,33
0,1 IAA + 1,0 KIN	2,27	84,00
1,0 IAA + 5,0 KIN	2,40	2,40

Table 2. Isolated apical buds from pepper on MS medium including only cytokinines: ZEA, BAP and KIN, after 40 days.

ZLATEN MEDAL		
MS medium mg/l	Leaf rosettes %	Callus %
1,0 ZEA	70,62	23,33
0,5 ZEA	52,74	22,22
1,0 BAP	50,75	26,51
1,0 ZEA	70,62	23,33
0,5 KIN	30,76	55,38
1,0 KIN	37,50	45,83
2,5 KIN	55,05	52,01
5,0 KIN	64,28	28,57
KURTOVSKA KAPIJA		
MS medium mg/l	Leaf rosettes %	Callus %
1,0 ZEA	84,16	7,69
0,5 ZEA	100,00	23,07
1,0 BAP	81,25	18,75
0,5 KIN	/	39,39
1,0 KIN	/	42,85
2,5 KIN	33,33	20,00