THE INFLUENCE OF DIFFERENT GROWTH REGULATORS TO *CAPSICUM ANNUUM JALAPEÑO* VITROPLANTLETS

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Summary: *Capsicum annuum* is an important vegetable for human alimentation, because of its content in vitamins, minerals and, especially, the *capsaicine*. In this experiment we have studied the development of *Capsicum annuum* vitroplantlets, the Mexican variety (*Jalapeño*), obtained by aseptic germination of this plant's seeds. The seeds were inoculated on Murashige and Skoog medium (BM), with and without growth regulators, resulting 4 experimental variants: V_0–control variant = BM without growth regulators, V_1 = BM+NAA(0.1mg/l), V_2 = BM+IBA(0.1mg/l), and V_3 = BM+KIN (0.1mg/l). The experiment, which lasted for 40 days, have revealed that the best growth medium for *Capsicum annuum* vitroplantlets is V_1 (BM+NAA), the IBA and KIN having a negative influence to these plantlets development. After 40 days of "in vitro" culture, the ex-vitroplantlets were acclimatized successfully in common soil.

Keywords: *Capsicum annuum*, Jalapeño, capsaicine, vitroculture, growth regulators, acclimatization
Abreviations: BM – basic medium; NAA – α-naphtylacetic acid; IBA – indole 3-butyric acid; KIN – kinetin

INTRODUCTION

Capsicum annuum is an important vegetable for human alimentation, because of its content in vitamins, minerals and, especially, *capsaicine*, which is the main pungent ingredient of hot red and chilli pepper. It has been considered as not only a cytoprotective but also a detrimental agent to the gastric mucosa (In Ohk Lee et all, 2007).

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In this experiment we have studied the development of *Capsicum annuum* vitroplantlets, the Mexican variety (*Jalapeño*), obtained by aseptic germination of this plant seeds. Besides other *Capsicum* species, the *Capsicum annuum Jalapeño* variety is well-known for its strong and flavored taste, mostly used as a condiment in Mexican food.

The reason of this experiment is the absence of this taxon in our country floral landscape.

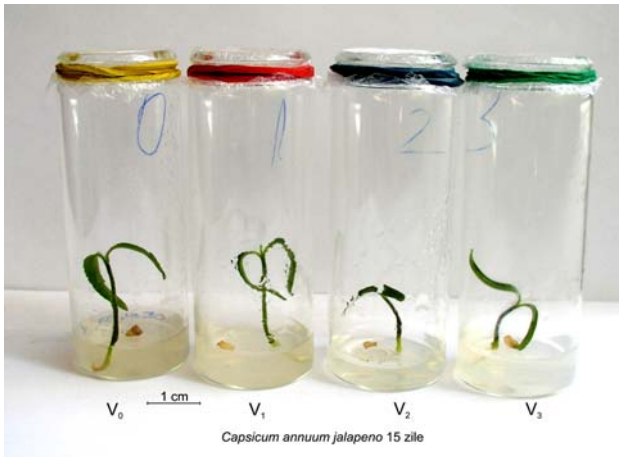

Figure 1. *Capsicum annuum Jalapeño* vitroplantlets after 15 days from inoculation on sterile media (V_0–control variant = BM without growth regulators, V_1 = BM+NAA(0.1mg/l), V_2 = BM+IBA(0.1mg/l), and V_3 = BM+KIN (0.1mg/l))

MATERIALS AND METHODES

The biological material for this experiment has consisted in *Capsicum annuum Jalapeño* seeds, taken from an authorized producer. These seeds were sterilized in ethylic alcohol and than in natrium hypochloride. After this procedure they were inoculated on Murashige and Skoog (1962) medium (BM), with and without growth regulators, resulting 4 experimental variants: V_0–control variant = BM without growth regulators, V_1 = BM+NAA(0.1mg/l), V_2 = BM+IBA(0.1mg/l), and V_3 = BM+KIN (0.1mg/l).

The culture media recipients were 8 cm high and 2,8 cm large, and were sterilized for 30 minutes at 121ºC (**Cachiţă** et al., 2004). Each bottle contained 5 ml culture medium.

RESULTS AND DISCUSSIONS

After 15 days from inoculation, the vitroplantlets were already between 3 and 4 cm high, best and quickest "in vitro" germination being found on control variant (V_0) (Fig 1, Table 1).

Table 1. *Capsicum annuum Jalapeño* evolution at 15 days from "in vitro" inoculation

Parameters	V_0	V_1	V_2	V_3
Stalk length (cm)	4.0	3.8	2.5	2.6
Leaflets	-	-	-	-
Root length(cm)	0.8	0.8	0.6	0.7
Root ramif.	-	-	-	-

At 30 days from experiment starting, inhibitory effects were manifested on V_2 and V_3, where IBA and KIN have been added into standard MS media. (Fig 2 and 3, Table 2)

Figure 2. *Capsicum annuum Jalapeño* vitroplantlets after 30 days from inoculation on sterile media (V_0–control variant = BM without growth regulators, V_1 = BM+NAA(0.1mg/l), V_2 = BM+IBA(0.1mg/l), and V_3 = BM+KIN (0.1mg/l))

Table 2. *Capsicum annuum Jalapeño* evolution at 15 days from "in vitro" inoculation

Parameters	**V_0**	**V_1**	**V_2**	**V_3**
Stalk length (cm)	4.0	3.8	2.5	2.6
Leaflets	4	4	2	2
Root length(cm)	1.8	1.8	1.6	1.7
Root ramif.	11	12	7	6

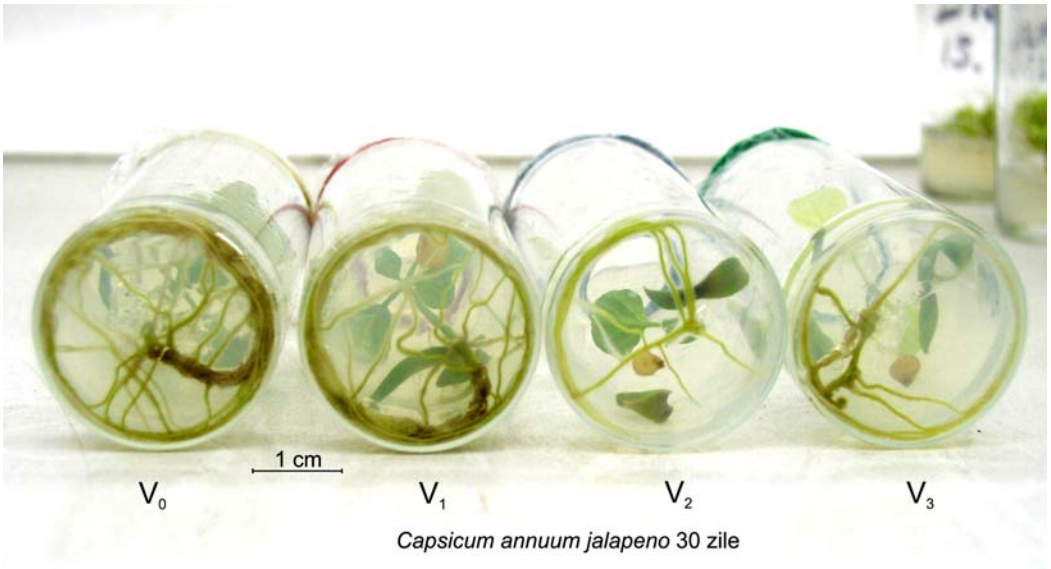

Figure 3. *Capsicum annuum Jalapeño* roots after 30 days from inoculation on sterile media (V_0–control variant = BM without growth regulators, V_1 = BM+NAA(0.1mg/l), V_2 = BM+IBA(0.1mg/l), and V_3 = BM+KIN (0.1mg/l))

45^{-th} day from the inoculation has shown the stimulant effect of the auxine (NAA) on V_1, where organogenesis was the best, as length and also as number of limbs (roots and foliage). Also, the color intensity of leaflets proves that here was generated the highest number of assimilator pigments (Fig 4, Table 3).

The V_2 and V_3 experimental variants have remained behind, the vitroplantlets being very wick and transparent (Fig 4).

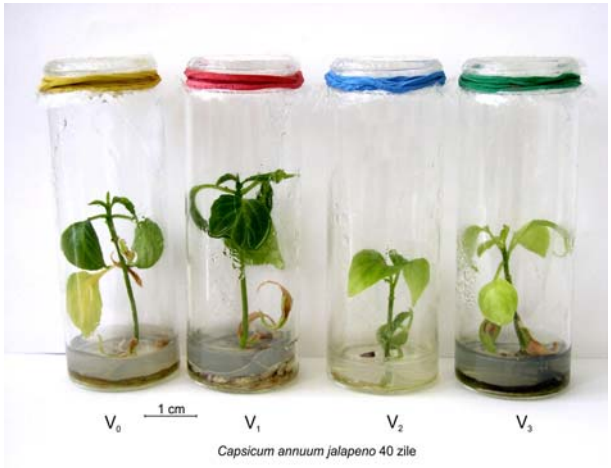

Figure 4. *Capsicum annuum Jalapeño* vitroplantlets after 40 days from inoculation on sterile media (V_0–control variant = BM without growth regulators, V_1 = BM+NAA(0.1mg/l), V_2 = BM+IBA(0.1mg/l), and V_3 = BM+KIN (0.1mg/l))

Table 3. *Capsicum annuum Jalapeño* evolution at 15 days from "in vitro" inoculation

Parameters	**V_0**	**V_1**	**V_2**	**V_3**
Stalk length (cm)	6.0	6.8	3.5	4.6
Leaflets	8	10	4	6
Root length(cm)	2.8	3.1	2.6	2.7
Root ramif.	11	14	7	7

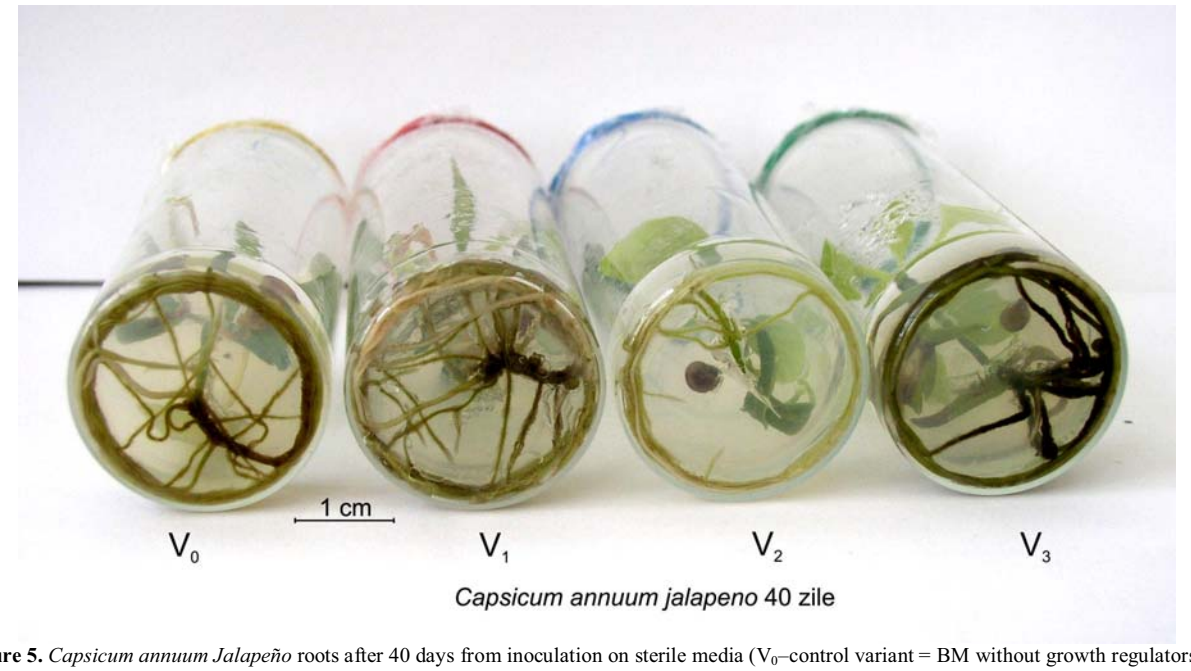

Figure 5. *Capsicum annuum Jalapeño* roots after 40 days from inoculation on sterile media (V_0–control variant = BM without growth regulators, V_1 = BM+NAA(0.1mg/l), V_2 = BM+IBA(0.1mg/l), and V_3 = BM+KIN (0.1mg/l))

After 40 day of vitroculture the plantlets were taken off from culture recipients and planted in common soil, where the acclimatization has developed very well, with a 98% survival percent on all experimental variants, and, later, fruits were yielded. (Fig 6)

Figure 6. *Capsicum annuum Jalapeño* – acclimatized plant, with fruit

CONCLUSIONS

Capsicum annuum Jalapeño can be cultured "in vitro" for multiplication purpose

The best *Capsicum annuum Jalapeño* growth can be obtained on BM with NAA added, 0,1mg/l

The *Capsicum annuum Jalapeño* vitroplantlets can be easily acclimatized in common soil

REFERENCES

Cachiță C.D., Deliu C., Tican R.L., Ardelean A., 2004, *Tratat de biotehnologie vegetală*, vol.I, Editura Dacia, Cluj-Napoca, pp.29-154

In Ohk Lee, Kwang Hyoung Lee, Jae Hee Pyo, Jie Hyun Kim, Yeu, Jung Choi, Lee, Yong Chan- *Anti-inflammatory Effect of Capsaicin in Helicobacter pylori-Infected Gastric Epithelial Cells,* Helicobacter; Oct2007, Vol. 12 Issue 5, p510-517

Murashige T., Skoog F., 1962 *A revised medium for rapid growth and bioassays with tobacco tissues cultures*