VITROCULTURE INITIATION OF *Chlorophytum comosum* FROM STOLON EXPLANTS, ON BASIC MS MEDIA WITH B-INDOLILBUTIRIC ACID (IBA) AND KINETIN (K)

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Abstract. Traditional methods of vegetative multiplication of plants consist in the usage of various fragments, but the efficiency of the multiplication rate is very low.

In this aspect, it exist a preoccupation related to fast multiplication of *Chlorophytum* species, a plant for interior decoration appreciated for its leaves. By using the method of vegetative multiplication, which involves stolons propagation, the vegetative multiplication is slow.

The research that are subject of this issue regarded the testing of possibilities of initiating a *Chlorophytum comosum* vitroculture for micro propagation, as well as for studying the reaction of stolon-type explants, in the presence of a hormonal balance of auxin and citokinin in the culture medium (Maghiar R, 2003).

MATERIAL AND METHODS

The vegetal material for experiments to initiate a *Chlorophytum comosum* vitrocultures, consisted of stolons apexes, dimensioned from mature plants, taken from the greenhouse.

Before the cultivation, fragments of stolons sized between 1,5 – 2 cm, had been washed for an hour with clear water. Then, before explanting, the vegetal material was introduced in sodium hypochlorite solution of 0,1%, diluted with sterile water in a rate of 1:2, in which TWEEN 20 was added (2-3 drops in 150 ml disinfecting solution). In this solution, the stolon fragments were kept for 10 minutes, after which they were repeatedly washed with distilled water, sterile, to remove the chloral ions.

The aseptized fragments were put in Petri capsules, sterile, placed on axenic filter paper.

For "in vitro" cultivation of apical explants drawn from stolons, we used a mineral base medium (BM) Murashige-Skoog (MS) (1962), to which the following vitamins were added: pyridoxine HCl, thiamine HCl, and nicotine acid (1 mg/l each), meso-inozitol 100 mg/l, regulators, i.e. IBA (β-indolilbutiric-acid) and K (kinetin) in 12 variants:

- growing regulators administrated simple:

V0 – BM MS without growing regulators – witness lot
V1 – BM MS +IBA 1 mg/l
V2 – BM MS + IBA 1,5 mg/l
V3 – BM MS + IBA 2 mg/l
V4 – BM MS + K 1 mg/l
V5 – BM MS + K 1,5 mg/l
V6 – BM MS + K 2 mg/l

- growing regulators administrated in mixture

V7 – BM MS +IBA (1 mg/l) + K (1 mg/l)
V8 – BM MS +IBA (1,5 mg/l) + K (1,5 mg/l)
V9 – BM MS +IBA (2 mg/l) + K (1 mg/l)
V10 – BM MS +IBA (1 mg/l) + K (2 mg/l)
V11 – BM MS +IBA (2 mg/l) + K (2 mg/l)

The pH of the medium was set at 5,7, with citric acid or NaOH, depending on the medium basicity or acidity. The culture media were introduced in containers of transparent glass, of 8 cm high and 4,5 cm wide, containing 10 ml culture medium each, distributed with a repartitor, obturated with aluminium paper, sterilized by autoclaving, at the temperature of 121°C, for 20 minutes, in the pressure cooker.

After cooling the medium containers, we passed to inoculating in aseptic conditions, in the hood with laminar flux of sterile air. Before inoculating, after every operation the instrumentary and the containers were sterilized in the spirit lamp flame.

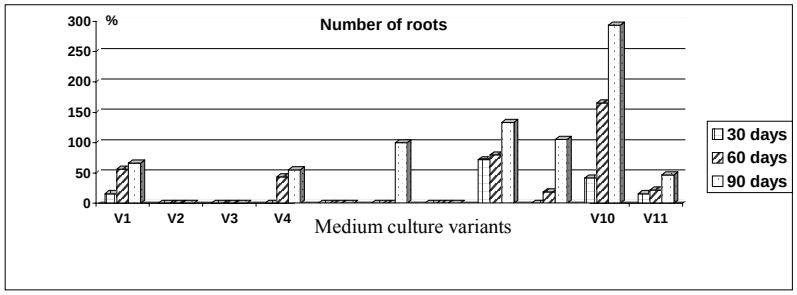
After inoculation, the containers with inocules were obturated with transparent polietilen paper and were put on the shelves, illuminated with white fluorescent light, with an intensity of 1700 lux and a photoperiod of 16 hours of light a day. The ambient temperature varied between 22-24°C during the day and about 20°C during the night.

The vitroplants were biometrized and photographed at an interval of *30, 60* and *90 days* from the *Chlorophytum* vitrocultures initiation, noticing the development of the roots and of the leaves (see fig. 2).

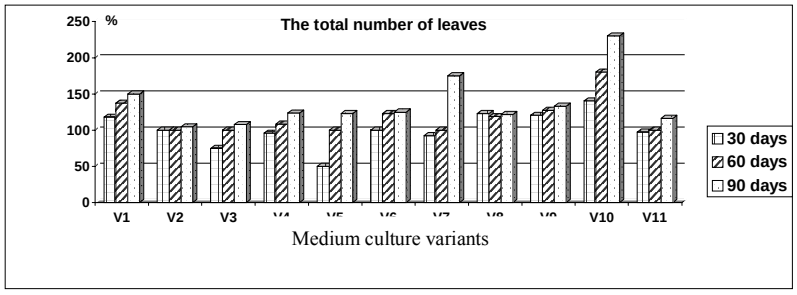
RESULTS AND DISCUSSIONS

In the case of IBA auxin, used at V1 (1 mg/l), V2 (1,5 mg/l) and V3 (2 mg/l) variants, the following aspects were noticed:

The rizogenesis appeared at *30 days* of vitroculture only at V1 variant with a slow increase up to *90* days, this being noticed in fig. 1A.



A



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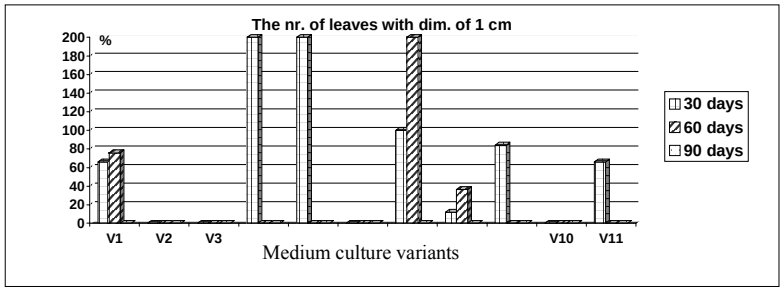

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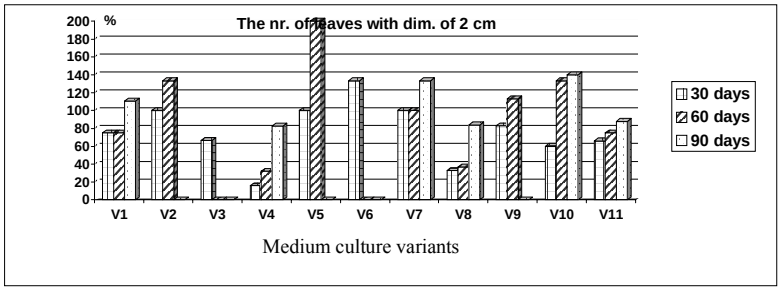

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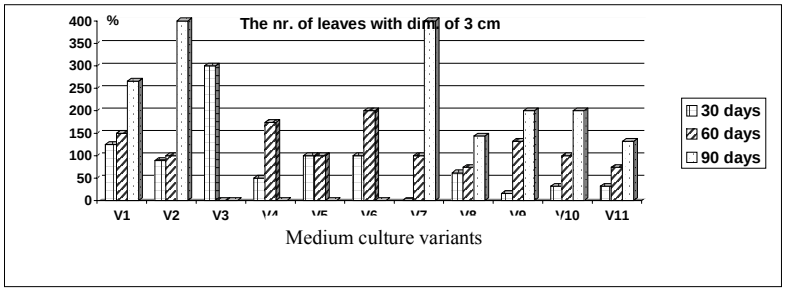
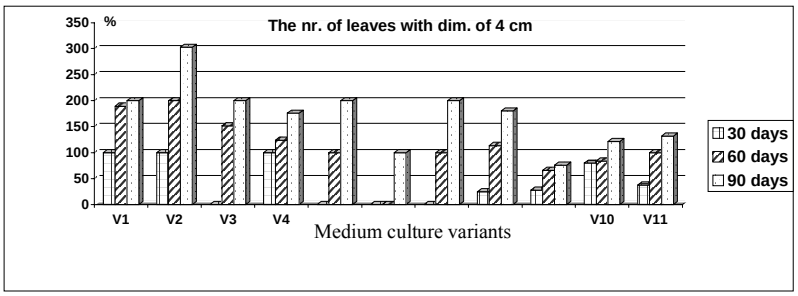
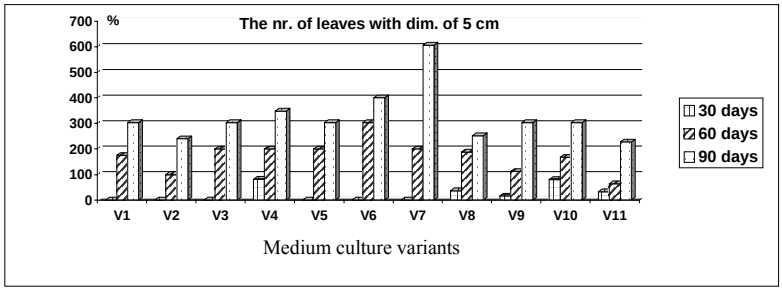

%
The nr. of leaves with dim. of 3 cm
400
350
300
250
200
150
100
50
0
V1 V2 V3 V4 V5 V6 V7 V8 V9 V10 V11
30 days
60 days
90 days
Medium culture variants

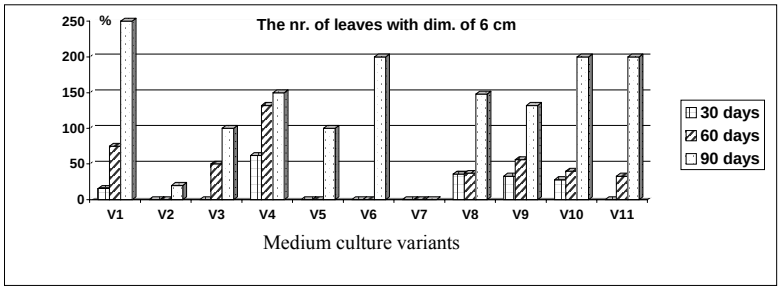
E


%
The nr. of leaves with dim. of 4 cm
350
300
250
200
150
100
50
0
V1 V2 V3 V4 V10 V11
30 days
60 days
90 days
Medium culture variants

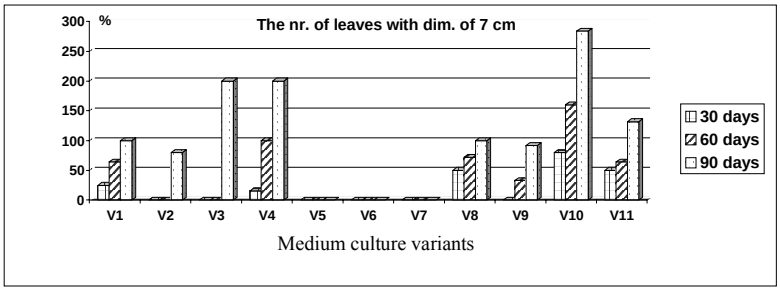
F


%
The nr. of leaves with dim. of 5 cm
700
600
500
400
300
200
100
0
V1 V2 V3 V4 V5 V6 V7 V8 V9 V10 V11
30 days
60 days
90 days
Medium culture variants

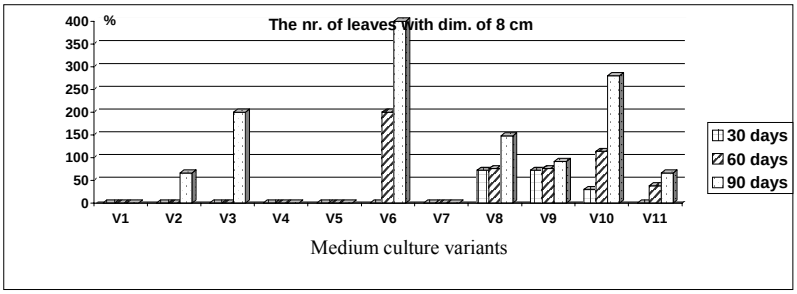
G


%
The nr. of leaves with dim. of 6 cm
250
200
150
100
50
0
V1 V2 V3 V4 V5 V6 V7 V8 V9 V10 V11
30 days
60 days
90 days
Medium culture variants

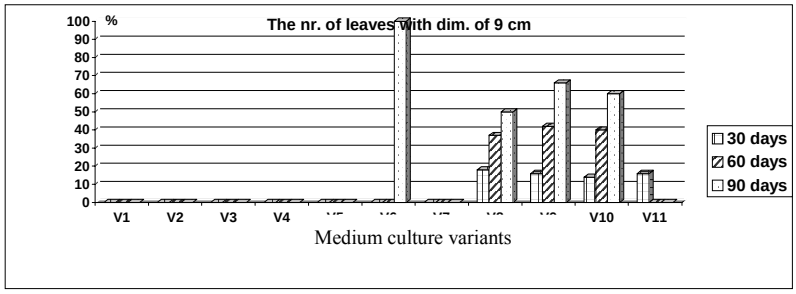
H


%
The nr. of leaves with dim. of 7 cm
300
250
200
150
100
50
0
V1 V2 V3 V4 V5 V6 V7 V8 V9 V10 V11
30 days
60 days
90 days
Medium culture variants

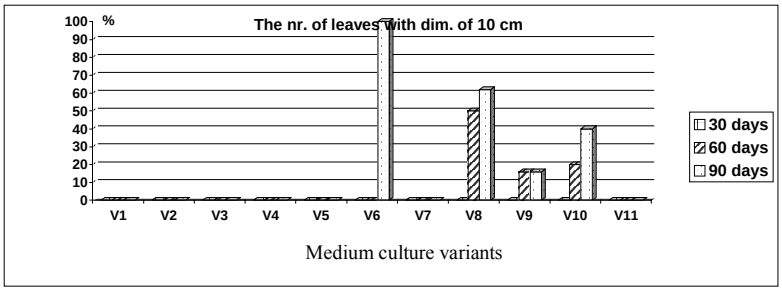
I


The nr. of leaves with dim. of 8 cm
%
400
350
300
250
200
150
100
50
0
V1 V2 V3 V4 V5 V6 V7 V8 V9 V10 V11
Medium culture variants
30 days
60 days
90 days

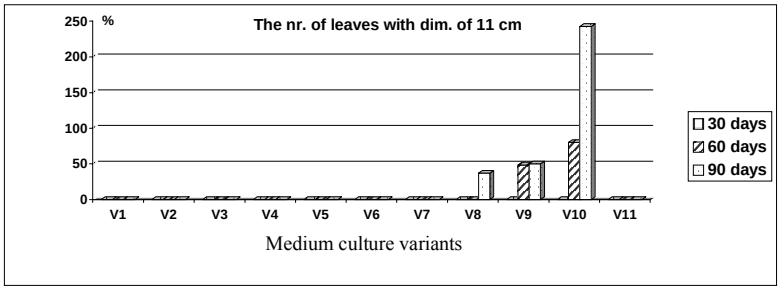
J


The nr. of leaves with dim. of 9 cm
%
100
90
80
70
60
50
40
30
20
10
0
V1 V2 V3 V4 V10 V11
Medium culture variants
30 days
60 days
90 days

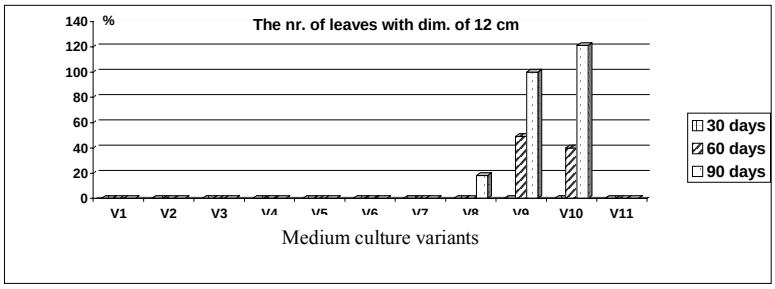
K


The nr. of leaves with dim. of 10 cm
%
100
90
80
70
60
50
40
30
20
10
0
V1 V2 V3 V4 V5 V6 V7 V8 V9 V10 V11
Medium culture variants
30 days
60 days
90 days

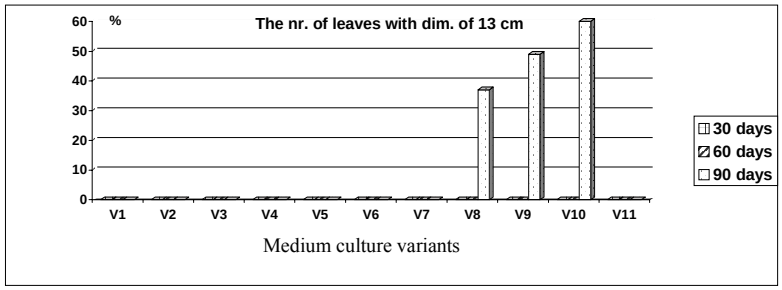
L


The nr. of leaves with dim. of 11 cm
%
250
200
150
100
50
0
V1 V2 V3 V4 V5 V6 V7 V8 V9 V10 V11
Medium culture variants
30 days
60 days
90 days

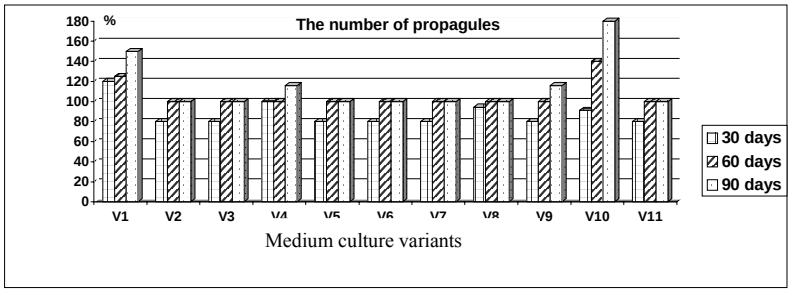
M


The nr. of leaves with dim. of 12 cm
%
140
120
100
80
60
40
20
0
V1 V2 V3 V10 V11
Medium culture variants
30 days
60 days
90 days

N



O



P

Fig. 1A-P – Biometric data referring to the growth of the *Chlorophytum* vitroplants at *30*, *60 and 90 days* of vitroculture, with **IBA**, simple or mixed MS medium with **kinetin**, on various concentrations: V1-culture media with MS +IBA 1 mg/l, V2 – culture media with MS + IBA 1,5 mg/l, V3 –culture media with MS + IBA 2 mg/l, V4 – culture media with MS + K 1 mg/l, V5 – culture media with MS + K 1,5 mg/l, V6 – culture media with MS + K 2 mg/l, V7 culture media MS +IBA (1 mg/l) + K (1 mg/l), V8 culture media MS +IBA (1,5 mg/l) + K (1,5 mg/l), V9 culture media MS +IBA (2 mg/l) + K (1 mg/l), V10 culture media MS +IBA (1 mg/l) + K (2 mg/l) and V11 culture media MS +IBA (2 mg/l) + K (2 mg/l), the percentage values are expressed to the registered parameters at the level of the witness lot vitroplantlets, V0 – MS simple medium culture, with 100% value.

The caulogenesis occurred at *30, 60* and *90 days* from the inoculation at all the variants, as follows:

In fig. 1B it can be observed the total number of leaves which at *30 days* recorded decreases of 25% at variant V3 and maximum increases of 110% at V1 in comparison with the parameter biometrized at the witness lot without growing regulators. At 60 and 90 days from the vitroculture there were recorded increases at all the studied variants, the maximum values being for V1 of 134% respectively 150%, as compared to the witness variant V0.

There were recorded leaves with the size of 1 cm (fig. 1C), only at the vitroplants of V1 with a minus of 40% in comparison with the witness variant V0 at *30 days* and 30 % at 60 days from the inoculation; at *90 days* raising over 1 cm.

In fig. 1D there were recorded the vitroplants with the size of 2 cm, even from *30 days* of vitroculture at all the variants with a minus of 40% at V3 and an increase of 100% at V2 as compared to V0, considered 100%. At 60 days from the inoculation, there can be noticed minimal decreases of 25% at V1 and a maximum increase of 133% at V2. At *90 days* of vitroculture, there were increases of 110% only at V1, the other variants having the leaves bigger than 2 cm at *90 days* of vitroculture, recorded at the reference lot V0.

The numbers of leaves with 3 cm size are plotted in fig. 1E, where it could be noticed at *30 days* of vitroculture a minus of 11% at V2 and a maximum increase of 300% at V3 as compared with the witness lot V0 without regulators. At *90 days* from the inoculation the vitroplants of V1 and V2 variants recorded maximum increases of 260% at V1, respectively 400% at V2; the vitroplants of V3 didn't record any values because they grew up at sizes higher than 3 cm due to the high concentration of auxin (2 mg/l).

The biometric data regarding the growth of *Chlorophytum* vitroplants resulted after *30, 60* and *90 days* of vitroculture with IBA simple or in mixture with kinetin, of different concentrations: V1 culture media MS with IBA 1 mg/l, V2 culture media MS + IBA 1.5 mg/l, V3 culture media MS + IBA 2 mg/l, V4 culture media MS + K 1 mg/l, V5 culture media MS + K 1,5 mg/l, V6 culture media MS + K 2 mg/l, V7 culture media MS +IBA (1 mg/l) + K (1 mg/l), V8 culture media MS +IBA (1,5 mg/l) + K (1,5 mg/l), V9 culture media MS +IBA (2 mg/l) + K (1 mg/l), V10 culture media MS +IBA (1 mg/l) + K (2 mg/l) and V11 culture media MS +IBA (2 mg/l) + K (2 mg/l), expressed by percentage values in comparison with the parameters recorded at the level of witness lot vitroplants, V0 - culture media, whose values were considered 100%.

In fig. 1F there are illustrated the vitroplants with leaves of 4 cm, which at *30 days* from vitroculture recorded values of 100% for variant V1 and V2. At *60 days* the vitroplants with the diameter of 4 cm were

recorded at variant V3 too, with a maximum increase of 189,4% at V1, in comparison with V0, considered 100%. At *90 days* from the inoculation, the maximum increase recorded was 303% at V2.

In fig. 1G there are illustrated the vitroplants with leaves of 5 cm, at V1, V2 and V3 variants, only at *60 days* after the inoculation, with a maximum increase of 200% at V3 variant, at *90 days* there was an increase up to 303% for V1 and V3 in comparison with V0.

In fig. 1H there are shown the vitroplants with leaves of 6 cm, which at *30 days* had a minus of 84% at V1 variant, which drops to 25% at *60 days* at the same variant. At *90 days*, a minus of 80% compared with V0 was recorded only at V2, at the other variants there was noticed a maximum increase of 250% at V1, in comparison with V0, considered 100%.

The biometric data regarding the growth of *Chlorophytum* vitroplants resulted after *30, 60* and *90 days* of vitroculture with IBA simple or in mixture with kinetin, of different concentrations: V1 culture media MS with IBA 1 mg/l, V2 culture media MS + IBA 1.5 mg/l, V3 culture media MS + IBA 2 mg/l, V4 culture media MS + K 1 mg/l, V5 culture media MS + K 1,5 mg/l, V6 culture media MS + K 2 mg/l, V7 culture media MS +IBA (1 mg/l) + K (1 mg/l), V8 culture media MS +IBA (1,5 mg/l) + K (1,5 mg/l), V9 culture media MS +IBA (2 mg/l) + K (1 mg/l), V10 culture media MS +IBA (1 mg/l) + K (2 mg/l) and

V11 culture media MS +IBA (2 mg/l) + K (2 mg/l), expressed by percentage values in comparison with the parameters recorded at the level of witness lot vitroplants, V0 - culture media, whose values were considered 100%.

The numbers of leaves with a size of 7 cm, from fig. 1I, appear at *30* and *60 days*, only at the vitroplants of V1, with a shortage of 75%, respectively 36%. At *90 days* of vitroculture variant V2 reached a shortage of 20% and V3 a maximum increase of 200% as compared to the witness lot V0 without growing regulators.

In fig. 1J there are recorded the vitroplants with the size of leaves of 8 am, only at V2 and V3 variants, which at *90 days* of vitroculture had a maximum increase of 200% at the V3 variant compared to V0.

The number of propagules is shown in fig 1P, in which it was noticed that at *30 days* from the inoculation the variants V2 and V3 recorded a decrease of 20%, meanwhile V1 variant recorded an increase of 120%. At *60 days* and *90 days* of vitroculture, the maximum increase recorded was at V1 of 130%, compared to 150% at the witness V0.

The fresh weight of roots, fig. 1R, was emphasized only at V1 with a shortage of 65,6% in comparison with V0 and the fresh weight of leaves had minimal values at all variants V1, V2 and V3, the lowest values were at V2 variant of 60%, meanwhile V2 recorded a minus of 21,9% compared with the witness lot V0.

The dry weight of roots, fig. 1S, was shown only at V1 a minus of 66% and the dry weight of leaves noticed minuses at all the variants, the lowest value was 61% at V1 and V2 compared with V0.

For variants V4 (1mg/l K), V5 (1,5 mg/l K) and V6 (2mg/l K) with kinetin, the following aspects were noticed:

Rizogenesis was recorded at V4 from the *60th day* of vitroculture with a minus of 48% and at *90 days* the values were recorded at V4 and V6, the minimum was 2% at V6 variant in comparison with V0, which can be noticed in fig. 1A.

The caulogenesis occurred at *30, 60* and *90 days* from the inoculation at all the variants, as follows:

In fig. 1B it can be observed the total number of leaves which at *30 days* recorded decreases of 50% at variant V5 and maximum increases of 100% at V6 in comparison with the parameter biometrized at the witness lot without growing regulators. At *60* and *90 days* from the vitroculture there were recorded increases at all the studied variants the maximum values being for V6 of 123% respectively 125%, as compared to the witness variant V0, considered the reference value of 100%.

There were recorded leaves with the size of 1 cm (fig. 1C), at *30 days* of vitroculture only at the vitroplants of V4 and V5 with a minus of 75% at V4 and a maximum increase of 200% at V5 in comparison with the witness variant V0.

In fig. 1D there were recorded the vitroplants with the size of leaves of 2 cm, they developed at *30 days* at all the variants V4, V5 and V6 with a minimum of 84% at V4 and a maximum increase of 135% at V6 as compared to V0. At *60 days* from the inoculation, there can be noticed values only for variants V4 and V5 and with an increase of 200% at V5, the vitroplants of variant V6 growing at sizes bigger than 2 cm due to the high concentration of kinetin (2mg/l). At *90 days* of vitroculture, only V4 records minimum values of 17.4% in comparison with the witness variant V0.

The vitroplants with leaves of 3 cm size are plotted in fig. 1E from *30 days* with a minimum of 50% at variant V4 and increases of 100% at V5 and V6 as compared with the witness lot V0. At *60 days* there are recorded minimum increases of 100% at variant V5 and maximum values of 200% at variant V6 as compared with the reference lot V0. At *90 days* no vitroplants with 3 cm leaves were recorded at any studied variant.

In fig. 1F there are observed leaves of 4 cm. At *30 days* of vitroculture there were recorded values at variant V4 with an increase of 100%; at *60 days* from the inoculation at variants V4 and V5 the vitroplants

had maximum increases of 124% at V4; at *90 days* values for all the variants, minimum increases of 100% at variant V6 and maximum of 200% at variant V5 as compared to the reference lot V0 considered 100%.

Leaves of 5 cm, fig.1G, were recorded at *30 days* only for the vitroplants of variant V4 with a minimum of 18%. At *60 days* there are recorded increases at all the studied variants, maximum of 303% at variant V6 and minimum of 200% at variants V4 and V5. At *90 days* from the inoculation increases were recorded for all the vitroplants of the studied work variants, minimum of 303% at variant V5 and maximum of 400% at variant V6 compared to the witness variant V0.

In fig. 1H, there are recorded vitroplants of 6 cm, at *30* and *60 days* from the inoculation, they appear only at the vitroplants of variant V4 with a minimum of 38% at 30 days and an increase of 132% at 60 days. At *90 days* from the inoculation values and variants V5 and V6 appear with a minimum increase of 100% at V5 and a maximum of 200% at V6 compared to the witness variant V0.

The biometric data regarding the growth of *Chlorophytum* vitroplants resulted after *30, 60* and *90 days* of vitroculture with IBA simple or in mixture with kinetin, of different concentrations: V1 culture media MS with IBA 1 mg/l, V2 culture media MS + IBA 1.5 mg/l, V3 culture media MS + IBA 2 mg/l, V4 culture media MS + K 1 mg/l, V5 culture media MS + K 1,5 mg/l, V6 culture media MS + K 2 mg/l, V7 culture media MS +IBA (1 mg/l) + K (1 mg/l), V8 culture media MS +IBA (1,5 mg/l) + K (1,5 mg/l), V9 culture media MS +IBA (2 mg/l) + K (1 mg/l), V10 culture media MS +IBA (1 mg/l) + K (2 mg/l) and
V11 culture media MS +IBA (2 mg/l) + K (2 mg/l), expressed by percentage values in comparison with the parameters recorded at the level of witness lot vitroplants, V0 - culture media, whose values were considered 100%.

Leaves of 7 cm, fig.1I, were recorded only for the vitroplants of variant V4 at *30, 60,* respectively *90 days* from inoculation with a maximum increase of 200% compared to the witness variant V0.

In fig. 1J, there are recorded vitroplants with leaves of 8 cm, only at the vitroplants of variant V6 that contains 2 mg/l kinetin, at *60 days* with an increase of 200%. At *90 days* from the inoculation there was recorded a maximum increase of 400% at V6 compared to the witness variant V0 considered 100%.

Leaves of 9 and 10 cm, fig.1K, 1L, were recorded only for the vitroplants of variant V6 at *90 days* from inoculation with an increase of 100% compared to the witness variant V0 considered 100%.

The number of propagules is shown in fig 1P at all the vitroplants of variants V4-V6, at 30 days it was noticed a minimum of 20% at variants V5 and V6 and an increase of 100% at variant V4. At *60 days* from the inoculation all the variants recorded equal increases of 100% at all the studied variants, and at 90 days the minimum increase is of 100% for variants V5 and V6, and of 116% at variant V4 compared to witness lot V0 that doesn't contain growing regulators.

The fresh weight of roots, fig. 1R, was recorded at variants V4 and V6 with a shortage of 82% at variant V4 respectively 65% at V6 in comparison with V0. The fresh weight of leaves was recorded at all variants V4-V6 with minimal values between 35% at variant V6 and 72% at V5 compared with the reference value of 100%.

The dry weight of roots, fig. 1S showed at V4 and V6 minimum values between 66.7% and 87.5%. The dry weight of leaves noticed minuses at all the variants V4, V5 and V6, maximum of 84% at variant V5 and minimum of 41% at V6 compared with the reference lot V0, considered 100%.

The mixture of auxin (IBA) and citokinin (K) led to noticing the following aspects: at studied variants V7 culture media MS +IBA (1 mg/l) + K (1 mg/l), V8 culture media MS +IBA (1,5 mg/l) + K (1,5 mg/l), V9 culture media MS +IBA (2 mg/l) + K (1 mg/l), V10 culture media MS +IBA (1 mg/l) + K (2 mg/l) and V11 culture media MS +IBA (2 mg/l) + K (2 mg/l).

Rizogenesis was recorded at V8, V9, V10 and V11 at *30 days* from the inoculation with minimal values of 84% at variant V11 in comparison with witness variant V0. At *60 days* from the inoculation the increase of 160% was recorded at V10 and at *90 days* only at V11 with shortages of 53%, the other variants have higher values, the maximum increase being of 300% at variant V10 in comparison with V0 that doesn't contain growing regulators, as shown in fig. 1A.

The caulogenesis occurred at *30, 60* and *90 days* from the inoculation at all the variants V7, V8, V9, V10 and V11, as follows:

In fig. 1B it can be observed the total number of leaves which at *30 days* recorded decreases of 2% at variants V7 and V11 and a maximum increase of 140% at V10 in comparison with the witness variant V0. At *60 days* from the inoculation there were recorded minimum values of 100% at variants V7 and V11 and a maximum increase of 175% at V10 in comparison with the witness variant V0, without growing regulators. At *90 days* from the vitroculture there were recorded minimal values of 120% at V11 and maximum of 230% at V10 compared to parameter biometrized at the witness lot V0, considered 100%.

There were recorded leaves with the size of 1cm (fig. 1C), only at the vitroplants of V7, V8, V9 and V11 at *30 days* from the inoculation with decreases of 88% at V8 and an increase of 100% at V7 in comparison with the witness variant V0. At *60 days* from the vitroculture, values at variants V7 and V8, minimum of 63% at V8 and maximum of 200% at V7 in comparison with the witness variant V0. At *90 days* of vitroculture all the vitroplants grew over 1cm, without values.

In fig. 1D there were recorded the vitroplants with the size of 2 cm, even from *30 days* of vitroculture at all the variants with a minus of 66% at V8 and an increase of 100% at V7 as compared to V0, considered 100%. At *60 days* from the inoculation, there can be noticed maximal decreases of 63% at V8 and a maximum increase of 133% at V10. At *90 days* of vitroculture, V9 doesn't record any values, but there were increases at the rest of the variants, the maximum reached of 140% at V10, recorded at the reference lot V0.

The number of leaves with 3 cm size are plotted in fig. 1E, where it could be noticed at *30 days* of inoculation at variant V7 doesn't record any values, the other variants recorded minuses, the lowest values is 84% at V9. At *60 days* of vitroculture drops of 26% were recorded at V7 and V11 and a maximum increase of 132% at variant V9 compared to witness variant V0. At *90 days* from the inoculation there were noticed only increases compared to reference lot V0 at all the variants V7-V11, the maximum increase being of 400% at variant V7.

In fig. 1F there were recorded the vitroplants with the size of leaves of 4 cm, at *30 days* of vitroculture the recorded values are low, the lowest value being at variant V8 of 75% and the highest of 20% at V10 compared to the reference variant V0. At *60 days* from the inoculation there are noticed minimum values of 34% at V9 and maximum of 113% at V8, values reported to the parameters of the witness lot V0. At *90 days* from the inoculation decreases are recorded only at variant V9 of 25%, and the other variants recorded increases, the maximum being of 200% at variant V7, values reported to witness variant V0 considered 100%.

There were recorded leaves with the size of 5cm (fig. 1G), only at the vitroplants of V8-V11, with decreases compared to the variant V0, maximum of 84% at V9 at *30 days* of vitroculture. At *60 days* from the vitroculture, there were recorded, minimum values of 46% at V11 and maximum of 200% at V7 in comparison with the witness variant V0. At *90 days* of vitroculture the vitroplants V7-V11 recorded increases, the maximum being of 606% at V7 in comparison with the witness variant V0, considered 100%.

In fig. 1H there are shown the vitroplants with leaves of 6 cm at variants V8-V11. Variant V7, because of the low content of auxin (1mg/l) and citokinin (1mg/l), didn't develop vitroplants higher than 6 cm. At *30 days* of vitroculture decreases between 64-72% at V8-V10 were recorded, as compared to V0, considered 100%. At *60 days* from the inoculation, the values were lower than 44-77% than those recorded at 30 days. At *90 days* of vitroculture, at V10 and V11 maximum increases of 200% were recorded, compared to the witness variant V0.

Leaves with the size of 7 cm, fig.1I, were noticed only at variants V8, V10 and V11, at *30 days* the minimum values being of 50% at V8 and V11. At variant V10 the values raise continuously from 20% at *30 days* to 160% at *60 days* and to 284% at *90 days* of vitroculture, values reported at the witness lot V0, considered 100%.

In fig. 1J there are shown the vitroplants with leaves of 8 cm at variants V8-V11. At *30 days* from the inoculation there are noticed values at variants V8-V10, minimum of 75% at V10 and maximum of 25% at V8, reported at the witness lot V0. At *60 days* of vitroculture there is recorded a deficit of 60% at variant V11 and a maximum increase of 110% at V10. At *90 days* from the inoculation, decreases were recorded at variants V9 and V11, maximum of 40%, the maximum increase of 280% being recorded at variant V10, compared to the witness V0.

Leaves with the size of 9 cm, fig.1K, were noticed at vitroplants of variants V8-V11, even from *30 days* with decreases between 82-84% which are shortened at *60 days* towards values of 60-63% at variants V8-V10. At *90 days* of vitroculture, decreases between 38-55% at variants V8-V10 are recorded, which are reported to the reference variant V0 considered 100%.

In fig. 1L there are illustrated vitroplants with leaves of 10 cm that recorded values at variants V8-V10 only at *60 days*, between 50-84% which fell at *90 days* of vitroculture towards values between 60-84%, reported to the parameters of the witness lot V0 considered 100%.

The biometric data regarding the growth of *Chlorophytum* vitroplants resulted after *30, 60* and *90 days* of vitroculture with IBA simple or in mixture with kinetin, of different concentrations: V1 culture media MS with IBA 1 mg/l, V2 culture media MS + IBA 1.5 mg/l, V3 culture media MS + IBA 2 mg/l, V4 culture media MS + K 1 mg/l, V5 culture media MS + K 1,5 mg/l, V6 culture media MS + K 2 mg/l, V7 culture media MS +IBA (1 mg/l) + K (1 mg/l), V8 culture media MS +IBA (1,5 mg/l) + K (1,5 mg/l), V9 culture media MS +IBA (2 mg/l) + K (1 mg/l), V10 culture media MS +IBA (1 mg/l) + K (2 mg/l) and

V11 culture media MS +IBA (2 mg/l) + K (2 mg/l), expressed by percentage values in comparison with the parameters recorded at the level of witness lot vitroplants, V0 - culture media, whose values were considered 100%.

Leaves of 11cm, fig.1M, were noticed only at the vitroplants of variants V8-V10 at *60 days* of vitroculture with decreases between 20-52% compared toV0. At *90 days* from inoculation, the minimum values recorded were of 63% at variant V8 and maximum of 242,4% at variant V10, reported to the values of the witness lot V0.

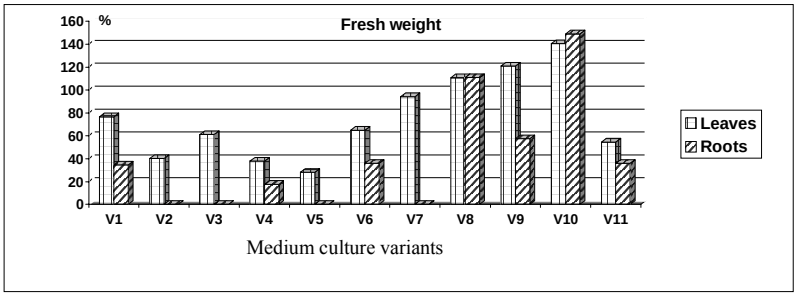
Fig.1N illustrates vitroplants with leaves of 12cm at variants V8-V10 at *60 days* from inoculation with values between 51-60% at variant V9 and V10, which at *90 days* of vitroculture are changed into increases of 100-121,2% at the same variants, values reported to variant V0 considered 100%.

Leaves of 13 cm, fig.1O were recorded at the vitroplants of variants V8-V10 at *90 days* of inoculation with values between 40-72% reported to the witness variant.

The number of propagules is shown in fig. 1P at *30 days* of vitroculture with minimum values between 10-20% at variants V7-V11 compared to the witness V0. At *60 days* from inoculation the vitroplants of variants V7-V11 recorded a minimum increase of 100%, and variant V10 records a maximum increase of 140% compared to the witness lot considered 100%. At *90 days* from inoculation the minimum increase is of 100% at variant V7, V8 and V11 and maximum of 180% at variant V10, reported to the parameters of the witness lot V0, medium without growing regulators.

The biometric data regarding the growth of *Chlorophytum* vitroplants resulted after *30, 60* and *90 days* of vitroculture with IBA simple or in mixture with kinetin, of different concentrations: V1 culture media MS with IBA 1 mg/l, V2 culture media MS + IBA 1.5 mg/l, V3 culture media MS + IBA 2 mg/l, V4 culture media MS + K 1 mg/l, V5 culture media MS + K 1,5 mg/l, V6 culture media MS + K 2 mg/l, V7 culture media MS +IBA (1 mg/l) + K (1 mg/l), V8 culture media MS +IBA (1,5 mg/l) + K (1,5 mg/l), V9 culture media MS +IBA (2 mg/l) + K (1 mg/l), V10 culture media MS +IBA (1 mg/l) + K (2 mg/l) and

V11 culture media MS +IBA (2 mg/l) + K (2 mg/l), expressed by percentage values in comparison with the parameters recorded at the level of witness lot vitroplants, V0 - culture media, whose values were considered 100%.



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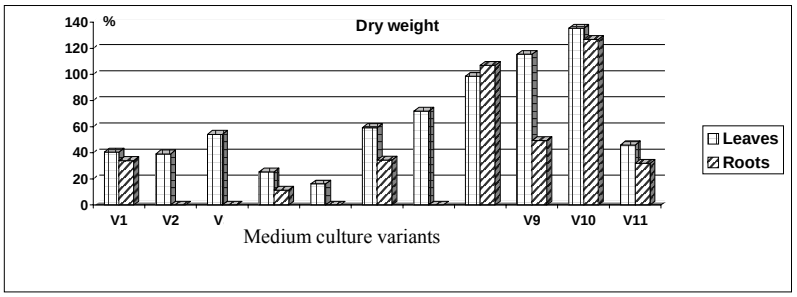


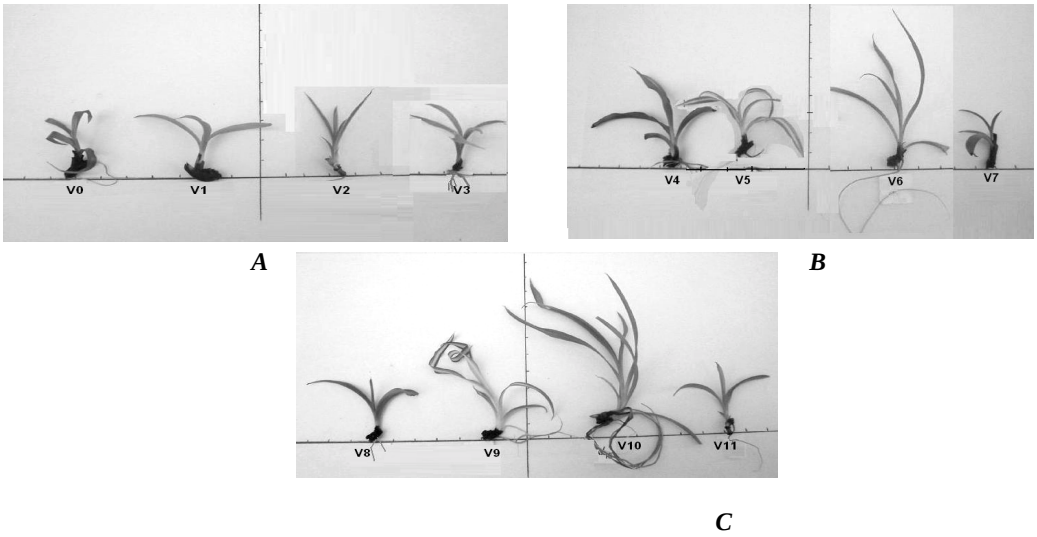
S

Fig. 1R-S – Biometric data referring to the *fresh* and *dry weight* of the *Chlorophytum* vitroplants leaves and roots, after *90 days* of vitroculture, with **IBA**, simple or mixed MS medium with **kinetin**, on various concentrations: V1-culture media with MS +IBA 1 mg/l, V2 – culture media with MS + IBA 1,5 mg/l, V3 –culture media with MS + IBA 2 mg/l, V4 – culture media with MS + K 1 mg/l, V5 – culture media with MS + K 1,5 mg/l, V6 – culture media with MS + K 2 mg/l, V7 culture media MS +IBA (1 mg/l) + K (1 mg/l), V8 culture media MS +IBA (1,5 mg/l) + K (1,5 mg/l), V9 culture media MS +IBA (2 mg/l) + K (1 mg/l), V10 culture media MS +IBA (1 mg/l) + K (2 mg/l) and V11 culture media MS +IBA (2 mg/l) + K (2 mg/l), the percentage values are expressed to the registered parameters at the level of the witness lot vitroplantlets, V0 – MS simple medium culture, with 100% value.

The fresh weight of the roots, fig. 1R, was emphasized at variants V8-V11 with a minimum of 64% at variant V11 and a maximum increase of 149% at variant V10, values reported to the witness lot V0.

The fresh weight of leaves was recorded at variants V7-V11 with a minimum of 45% at variant V11 and a maximum increase of 140% at V10, compared to the witness lot V0.

The dry weight of roots, fig.1S, was recorded at variants V8-V11 with a decrease of 68% at V11 and maximum increases of 127% at variant V10, compared to variant V0. The dry weight of leaves registered values at variants V7-V11, minimum of 54% at variant V11 and a maximum increase of 135% at V10, reported to the parameters of the reference lot V0.



A ***B***

C

Fig. 2A-C Aspects of *Chlorophytum* vitroplants at 90 days cultivated on different variants of culture media V0- culture media MS simple, V1-culture media with MS +IBA 1 mg/l, V2 – culture media with MS + IBA 1,5 mg/l, V3 –culture media with MS + IBA 2 mg/l, V4 – culture media with MS + K 1 mg/l, V5 – culture media with MS + K 1,5 mg/l, V6 – culture media with MS + K 2 mg/l, V7 culture media MS +IBA (1 mg/l) + K (1 mg/l), V8 culture media MS +IBA (1,5 mg/l) + K (1,5 mg/l), V9 culture media MS +IBA (2 mg/l) + K (1 mg/l), V10 culture media MS +IBA (1 mg/l) + K (2 mg/l) and V11 culture media MS +IBA (2 mg/l) + K (2 mg/l).

CONCLUSIONS

The *Chlorophytum* vitroplants regenerated at the level of stolons fragments, at all the variants, these having leaves with an average size of 5 cm.

The rizogenesis was recorded at variants V1, V4, V6, V8, V9, V10 and V11, variant V10 having the strongest rizogenesis (culture media MS +IBA (1 mg/l) + K (2 mg/l).

The vitroplants with leaves of 13 cm were recorded at *90 days* of vitroculture at variants V8, V9 and V10, the highest value was reached at variant V10.

The best hormonal balances used were those having in their structure auxin and citokinin, respectively variants V8, V9, V10 and V11.

The strongest caulogenesis for variants with auxin was recorded at V3 that contained 2 mg/l IBA; with citokinin at V6 that contained 2 mg/l K; in mixture of auxin and citokinin at variant V10 that contained 1 mg/l IBA and 2 mg/l K.

BIBLIOGRAPHY

Cachita, C. D., Sand, C., 2000, Vegetal Biotechnology. Theory and Practice.Vol.1, ED.Mira Design, Sibiu, p. 272-276

Maghiar, R., Cachita, C. D., Vancea, A., 2003, Vitroculture Initiation for *Chlorophytum Comosum* from Stolon Explants. Anals of the University of Oradea, p.375-379.

Murashige, T., Skoog, F., 1962, A revised medium for rapid growth bioassays with tobacco tissue cultures. In: ”Physiol. Plant.”, 15, p.473-497.