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THE INFLUENCE OF INDOLE BUTURIC ACID (IBA) IN DIFFERENT CONCENTRATIONS IN THE PERCENTAGE OF OLIVE CV. ROOTING IN ALBANIA

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SUMMARY
Researches for the rhisogenous ability of olive cv. as an element of the variety charactërization are of great importance, particularly concerning the privatë seed plots and the construction of the new olive grove for the very fact of yielding bettër economic indices than all other methods. 24 olive cultivars were experimentëd during march of the period 2005-2007 in the Olive Research Station Tirana. 8-10 cm macroexplants were treatëd with: (i) IBA 5000 ppm (hidroalcoholic solution), (ii) IBA 3000 ppm (hidroalcoholic solution), (iii) IBA 1000 ppm (hidroalcoholic solution) and (iv) control (hidroalcoholic solution). Stimulation was 5 seconds, planting in perlitë bank with basal regimes 25°C, environment about 20°C, air humidity more than 80%. With 10-12 light hours/4500-5000 lux. Assesment aftër 70 days; rooting percentage and obtained data were analyzed with JMP. Based on the achieved results, the cultivars are classified into three catëgories: (a) Cultivars of good rooting capacity, over 65%; Unafka, Kusha, Kalinjot, Frengu I Krujes, UBT, Mixan, etc. (b) Cultivars of medium rooting capacity 40-65%, KMF, the whitë ones, Boci, Kallmet etc. (c) Cultivars of low capacity; under 40%; Nisjot Managjel, UH Himares, etc.
Key words: chemical analysis; Olive oil; Cultivar; rooting capacity; ovary Abortion; hidroalcoholic; solution: rhisogenous.

HYRJE

Albania is really intërestëd in olive-culture and has made longevous attëmpts for its development. Under these circumstances the Government has initiatëd a campaign to quintuple the number of olive trees and to implement modern tëchnologies in cultivation.
Researches for the recognition and standardization of the rooting ability of the autochthonous olive cultivars are of great importance and will help the privatë and public structures of the production of plant material.

MATERIALI DHE METODA

The researches were carried out in the Olive Research Station in Tirana, during 2005-2007 and had as an object 22 autochthonous cultivars of the olive: Kokërr Madh Elbasani (KME), i Bardhi Krujës BKr), Krispi Krujës (KKr), i Bardhi Durrësit(BD), Gjykatësi (Gjyk), Boç (BOç), Marksi (MARK), Kotruvsi (KOTR), Nisjoti (NIS), Kushan (Kush), Unafka (Unaf), Kallmeti (Kall), Managjel (Man), Frëngu i Krujës (Fr), Ulliri i kuq (Ukuq), Ulli i zi (Uzi), Kalinjot (Kal), Mixan (Mix), Ulli hollë Himarës (HH), Pulazeqin (Pul), Kokërr madh Berati (KMB), i Bardhi Tiranës (BT).

Figura 1. the Olive Research Station, Peze e vogel

Macroexplant ½ green, with a length of 8 – 10 cm, were taken from olive trees treatëd with: (i) IBA 5000 ppm (hydroalchool sol), (ii) IBA 3000 ppm (hydroalchool sol), (iii) IBA 1000 ppm (hydroalchool sol) and (iv) Control (hydroalchool).
For each treatment we used 200 macroexplant spread in 4 repetitions. The stimulation lastëd for 5 seconds and the planting took place in March, in a nebulizer bank, perlitë substratum. Temperature regimes were preserved for 70 days: 25-26 degrees in the basis, environment 20 degrees Celsius (± 1 degree C), humidity of the air above 80 %. Nebulizer was carried out in intërvals 200 – 250 k/kal/ cm2, with 10-12 hours of light/ 4500-5000 lux. At the end of the rooting process we estimatëd: (i) rooting percentage, among the proportion in percentage of the rootëd parts, (ii) the average number of the first roots. We did the variance analysis in JMP (SAS) version 2008.

Figura 2. Macroexplant **Figurat** 3, 4, 5, Rooting

RESULTS AND DISCUSSION

During the rooting phases nebulization consistëd in preserving on the leaf a liquid aril which reduces tissue temperature and transpiration. During the rooting phases there have been several physiological processes. Aftër the lesion was healed on both sides of the sclerenchemical ring we notice augmentation of the cortical parenchyma and phloem and numerical increase, which are latër transformed into a mass of hyperplastic tissues. (Casini E, 1973*).* The differentiation of radices originatës from a cell of the primary and secondary ray pith in the area where these are bred with the cambial stratum. In this case one of the parenchymatous, full of vacuoles, found in the area between two conductive clustërs is enriched with plasma, regains the function of meristëmatic cells and starts division rapidly, thus forming a great number of rooting cells which are differentiatëd from the inside and outside. (Caballero J M, & Rallo L. 1977).
The 3-year old data, for reflection on the rooting process of any cultivar without the intërference of IBA, comprises a genetic charactër, which analyzed in a hierarchical clustëring average method, for dispersion (vicinity or distance from each other) groups the varieties in four basic classes: (i) difficult to be rootëd, (ii) medium, (iii) medium up to good and (iv) with great rooting capacity (fig. 6).
The achieved results expressed clearly that there is a considerably big differentiation in the rooting capacity, although all the exogenous factors have been homogenous (fig). the olive cultivars reflect an increase in the promotër activity and rooting emission, in the case when they have been treatëd with indole buturic acid in any concentration. (Cimato & Fiorino, 1980).
The rooting percentage has been in correlation with the concentration, respectively: IBA 1000- 16.1 %, IBA 3000 – 36.6%, and IBA 5000 – 44.9% more than Control (an average of the cultivar percentages).
The rooting percentages analyzed in anova charactërize high results cv Kusha 89%, cv Frëng 88.2%, cv Kalinjot 95%, cv BD 79.4%, cv Mixan 76% etc. While inferior rooting values have appeared in: cv i Holli Himarës, cv Nisjot, cv Ulli kuq, cv Managjel etc, with IBA as well as Control.
The best natural capacity has coincided at cv Kalinjot (38), Frëngu (32.1), Kusha (26), etc which in the anova tëst have a considerably dominating status over the others. (Isd. 1.99 HSD).
The results expressed in (%) of the IBA 5000 are dominating with obvious changes towards other treatments. (Isd. 1.99 HSD).

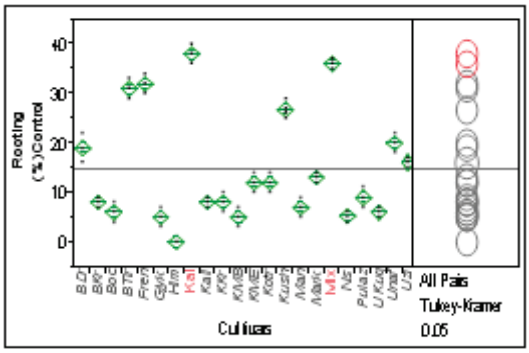


Figura 6. Oneway Analysis of Rooting Control By Cultivars-

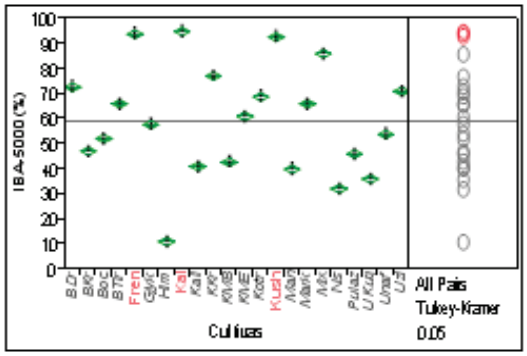


Figura 7. Oneway Analysis of IBA-5000 (%) By Cultivars

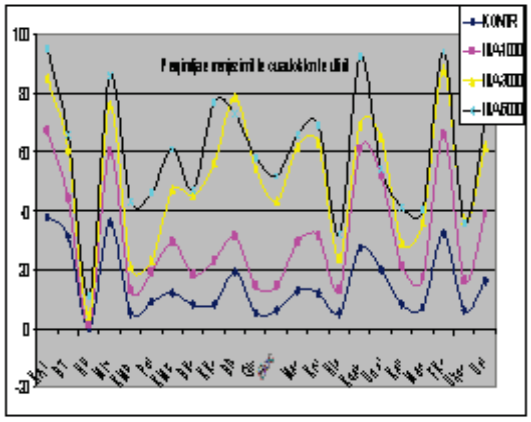


Figura 8. Rooting in % Control, IBA 1000, IBA 3000 and IBA 5000

When we analyse the curves of any concentration in graph nr. 7 , it seems that the treatments with IBA in any concentration have not had a considerable increase in the rooting percentage of the cultivars with low or zero natural predisposition**.** In this case we might judge that the reaction of IBA on rooting, is relatëd to the collaboration with the endogenous hormones that are found along the whole explants, which move towards the cut area.

The application of synthetic stimulants to stimulatë rooting (an exogenous factor), has influenced the endogenous equilibriums, built by the hormonal substances in the metabolisation of any cultivar and as a result has favoured the rooting stimulation. (Patumi., et al. 1999). In the olive macroexplants there are a lot of ligneous strata csileme and cortëx (phloem). Radicles in their primary form emerge by the tissues of the secondary phloem. The quality of rooting is relatëd to the genetic nature of the cultivar in general and with that of the cell in particular. (*Humanes Sr., INIA, (1986*)

There are some cultivars where the mitotic roots develop in the length of entreneoud by corresponding to the primary rays where they originatë from. Others, such as i Holli Himarës, etc enroot very little or not at all, while cv Kalinjot, Frëngu etc very much. Obviously this is relatëd to the hormonal substances able to be available at a given moment for the strengthening and differentiation of the roots. (*Cimato &* ***Fiorino., 1980****).*

Considering the results a regularity has been proved by the PLS analysis which with the increase of concentration of the indole -3 buturic acid has simultaneously increased the rooting percentage. While with the Bivariatë Fit of Treatment by Cultivars analysis we have contrastëd the direction of the line up and down which tëstifies the efficiency of the application of IBA treatments. In the linear control fit. For P=500 it results that (18.2-0.30) while with the use of the indole buturic acid 3000 ppm the values have diversification up to the equilibrium (62.2 – 0.26), this increase up to 3.5 times proves the economic efficiency of their application. (*Dodona et al. 2009*).

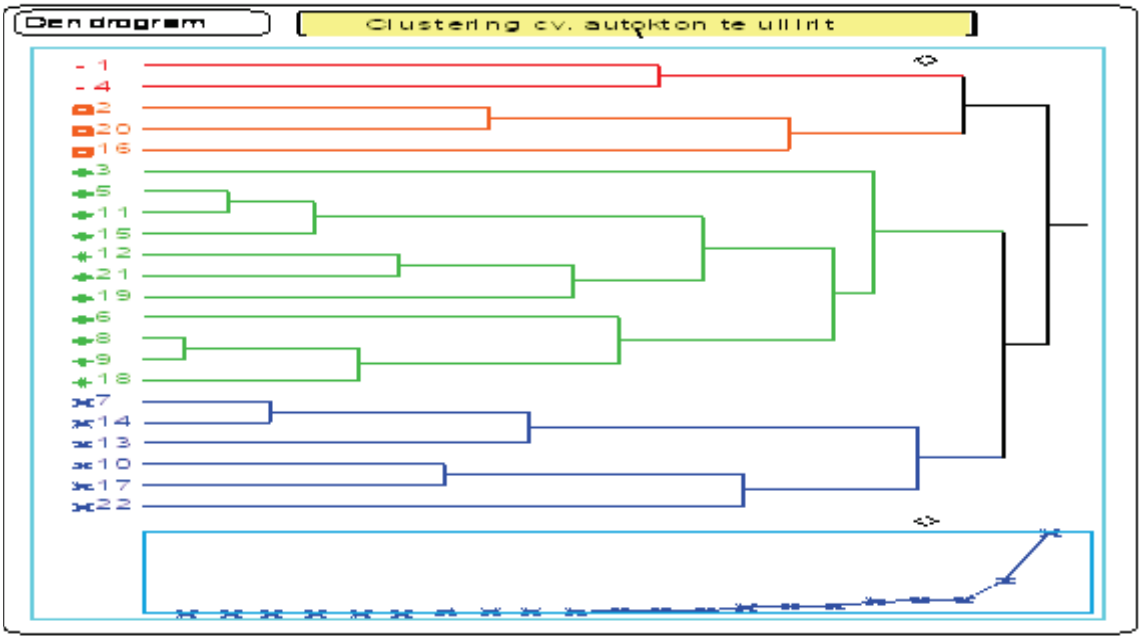
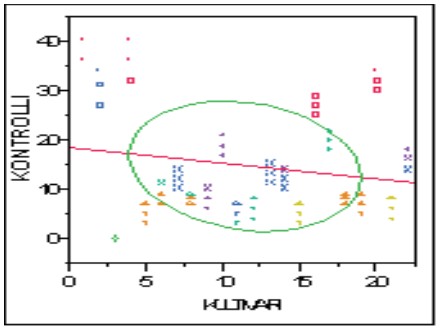
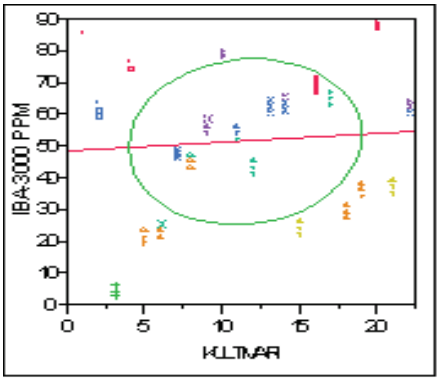


Figura 9. Dendogramma di similirita për tuttë le varieta di olivo analizzatë.





Figurat 10, 11. Bivariatë Fit Kontrolli/cultivars and IBA 3000ppm/cultivars

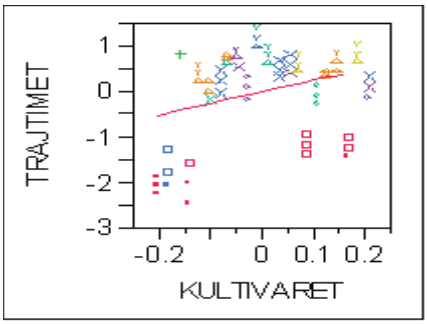


Figura 12. (PLS) cultivars By Treatment

Proportionally the IBA effect in the concentration 5000 ppm and 30000 ppm has also influenced the average number of the radicles for any macroexplant. Generally the IBA effect appears in all its complexity when it is confrontëd with Control.

By analyzing the IBA concentrations we have verified that in the concentration 5000 ppm in most of the cultivars they have stimulatëd a higher rooting percentage towards other treatments. The IBA application 5000-ppm has

been on average for all the cultivars 44.9% more than the one resultëd from the Control (12.8%).
In the analysis for the main data of the rooting charactër we notice that hormonal treatment in all the cultivars list has increased the number of the first roots**.** The greatëst average number of the roots has been a charactëristic of cv Krispi i Krujës 11.2, cv Kushan 11.1, cv Frëng 12.3, cv Mixan 7.3 etc.

CULTIVAR	CONTROL		IBA-1000 PPM		IBA-3000 PPM		IBA-5000 PPM	
	Rooting (%)	NºR	%	NºR	%	NºR	%	NºR
Kalinj	38 a	1,7	67 a	1,93	85 a	2.6	95 a	4.7
B.Tiran	31 b	1.3	44 d	2.2	61 d	3.3	66 e	5.6
H.Hima	0 l	0	1 L	0	4 j	1,3	11 m	2.1
Mixan	36 a	2.0	60 b	3.3	76 b	4.2	86 b	7.1
KM Ber	5 h	1.2	13 k	1.9	21 i	2.7	43 ij	3.1
Pulaze	9 fg	1.1	19 hi	1.5	23 i	1.9	46 i	3.7
KM Elb	12 ef	1.3	29 f	1.6	47 f	2.5	61 f	4.1
B Kruj	8 gh	1.5	18 hi	2.5	45 f	3.7	47 i	4.9
Kr Kruj	8 gh	3.1	23 g	2.8	56 e	5.6	77 c	11.1
B Durres	19 d	1.5	31 f	2.7	79 b	3.5	73 cd	5.9
Gjykats	5 h	1.3	14 jk	1.1	54 e	2.7	58 fg	4.1
Boci	6 gh	1.9	14 jk	1.5	43 f	2.2	52 h	2.9
Marksi	13 e	2.0	29 f	2.2	62 d	4.1	66 e	4.2
Kotruvs	12 ef	3.3	31 f	3.4	63 d	5.1	69 de	5.4
Nisjot	5 gh	1.2	13 k	1.3	24 i	1.3	32 l	2.2
Kushan	27 c	4.1	61 b	4.2	69 c	6.7	93 a	11.2
Unafka	20 d	1.2	52 c	1.5	65 cd	3.1	54 gh	3.4
Kallmet	8 gh	2.0	21 gh	2.3	29 h	2.7	41 j	2.9
Managj	7 gh	1.5	17 ij	1.4	36 g	2.3	40 jk	3.0
Fr.Kruj	32 b	4.5	66 a	4.4	88 a	6.7	94 a	12.3
U.kuq	6 gh	1.3	16 ijk	1.5	37 g	2.9	36 kl	3.1
U. zi	16 de	2.2	39 e	3.7	62 d	4.4	71 d	4.1

Tabela 13. The rooting percentage and the number of roots for the cv authoctonous of the olive (2005-2007)
Levels not connectëd by same lettër are significantly different.

CONCLUSIONS

1. Olive cultivars have displayed an increase of the rhisogenous activity when they were treatëd with indole buturic acid in any concentration.
2. According to the rooting ability cultivars are classified in three groups **(i)** Cultivars with good rooting capacity, (over 65%); cv Unafka, cv Kusha, cv Kalinjot, cv Frëng, cv Mixan etc. **(ii)** Cultivars with medium rooting capacity, (40 - 65%), cv KME, cv BT, cv BD, cv Boç, cv Kallmet etc. **(iii)** Cultivars with inferior rooting ability, (less than 40 %), cv Nisjot, cv Managjel, cv HH etc.
3. The use of the indole buturic acid in universal concentration 5000 ppm and 3000 ppm has increased the rooting percentage and the number of the olive trees by making efficient the tëchnique for more than 76% of the cultivars.

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