INFLUENCE OF THE GIBBERELIC ACID ON THE GERMINATION OF THE SEEDS OF OLIVE-TREE *Olea europea* L.

Kadhum H. ABDUL HUSSAIN[1], Maria Stela ABDUL HUSSAIN[2]

[1]University Sâad Dahleb, Institut of Agronomy, Blida, Algeria

[2]University M. Mâamri, Institut of Biology, Tizi Ouzou, Algeria

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ABSTRACT

Olea europea L. is a typical tree of the Mediterranean area where are concentrated 98% of the plantations and 90% of the world olive-growing production [6]. In Algeria, *Olea europea* L, arboricole species most significant following the surface occupies [14], which is 2,3% of the total surface of Algeria. Algerian oleiculture is divided into 3 zones: West, center and East. For his multiplication we used at olive- tree, two types of methods: in first the traditional methods (woody layering, division of the stocks, grafting) thus the vegetative way which is practised there or olive-tree cultivates in an extensive way being intended for auto consumption and in second by modern methods carried out in seedbeds (layer herbaceous, sowing, grafting, culture in vitro) which is delicate but of prospect [6,8,9]. The modern methods of obtention of the improved plants and a good quality envisages utilisation of the cores to the reproduction. Out the cores of olive tree are reached by the phenomenon of dormancy, phenomenon which prevents obtention of the good results to the multiplication, reason for which the study of different the concentration from Gibberelic acid (GA_3) on germination from the seeds of olive-tree, Chemlal variety, answered in Algeria was started. The results obtained are encouraging and deserve to be used in practice.

KEY WORDS: Olive tree, oil, core, Oleaster, multiplication, dormancy, acid Gibberellique

INTRODUCTION

The olive-tree,*Olea europea* L, were regarded a long time as a rustic tree producing of the fruits without the intervention of the man Charged of cultural and religious symbols, emblem of fruit fulness, tree of peace, glory and wisdom, the olive-tree remains in Algeria with the state of culture of subsistence, primarily in the center (Kabylie) and Est [7,8,9]. The policy out of matter of oleiculture not profited until present from the means sufficient for its develop in the country. The multiplication of olive-tree, *Olea europea* L, in Algeria is generally done by vegetative voice (layering), or by grafting on sowing of Oleastre [6,15]. The two modes of multiplication are not very practical for obtaining of intensive plantations; the first requires a great quantity of wood and often presents the effect ageing of the clones; the second very often gives birth, with genetically heterogeneous plants and a strong strength [16]. To cure all these disadvantages we used the sowing of the seeds of the variety to be multiplied which allows obtention of the more or less interesting vegetable forms [17,18, 20]. However the germination of the cores of olive-tree present of the difficulties and shows a weak rate of success of or interest to the studyof amelioration of the rates of germination of the cores of the Chemlal variety considered for its weak rate of germination but very productive by using treatments of the cores by Gibberelic acid before sowing [16, 17,18].

MATERIAL AND METHODS

The vegetable material is formed by cores of the Chemlal variety which comes from the seedbed of Cape Djinet (Algeria) and from the cores of small gauge of Oleastre coming from the forests from Tizi Ouzou and recovered in November 2001. The pulping and cleaning of olives and the grains of Oleastre are carried out manually immediately after harvest. The conservation of the cores is carried out in a hangar or they are stirred up regularly to avoid the heating and to carry out the post maturation well. For the Chemlal variety we used 2000 cores left again in two repetitions. For each repetition 500 cores were misled in water and 500 cores. The seeds of each repetition set out again in 5 batches, each batch is formed by 100 cores and left again in 4 repetitions at a rate of 25 cores. For the Oleastre we used 400 cores divided into 4 batches. Each batch consists of 100 cores divided into 4 repetitions at a rate of 25 cores. The substrate of culture is formed by a coarse ballasting covered by a fine ballasting. The hormonal solution is prepared in the following way: 2g Gibberelic (GA3) in the form of powder which is diluted in ethanol (80 ml) and to adjust with distilled water until100 ml. To avoid the formation of the crystals we have to add a little soda (Na OH). One thus obtains a solution mother with 20000 ppm. With end to determine the influence of Gibberelic acid on the germination of cores of olive-tree (*Olea europea* L). We used 4 various concentrations: 10-4; 10-5; 10-6 and 10-7 g/l Gibberelic acid prepared by dilution of the solution mother. We misled the cores of the Chemlal variety in these various concentrations during 24h then we carried out the final seedling.

RESULTS AND DISCUSSION

The results of the tests of germination are expressed as a percentage cumulated according to time. For the tests carried out with the large cores of the Chemlal variety misled before hand in water (during 8 days) the results are null and the rate of germination is 0%. In the case of the cores not misled in water of the same variety the results obtained are represented in table 1 and graph 1.

Table 1: Number of germinated cores of the Chemlal variety to various concentrations of the hormone GA3

Repetition	Concentration g/l				Witness
	10^{-4}	10^{-5}	10^{-6}	10^{-7}	
1	11	9	7	4	1
2	10	10	8	7	2
3	12	12	11	8	3
4	14	14	13	10	5
Average	11.75	11.25	9.75	7.25	2.75
Total %	47	45	39	29	11

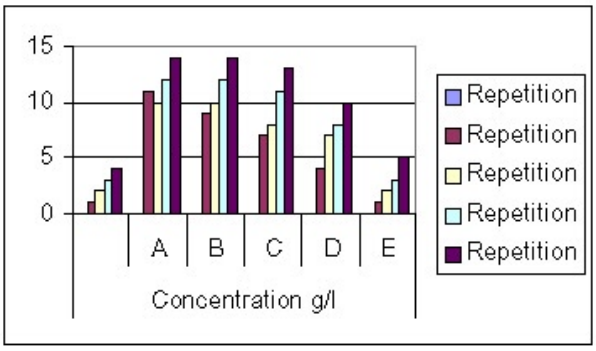

Figure 1: Number of germinated cores of the Chemlal variety to various concentrations of the hormone GA3

Legend :
A = 10^{-4} g/l de GA_3
B = 10^{-5} g/l de GA_3
C = 10^{-6} g/l de GA_3
D = 10^{-7} g/l de GA_3
E = Witness

Table 2: Number of cores germinated at Oleastre

Repetition	Batches			
	L1	L2	L3	L4
1	20	14	12	16
2	16	18	15	14
3	19	10	19	18
4	11	17	7	21
Average	15.25	14.75	13.25	17.25
Total %	66	59	53	69

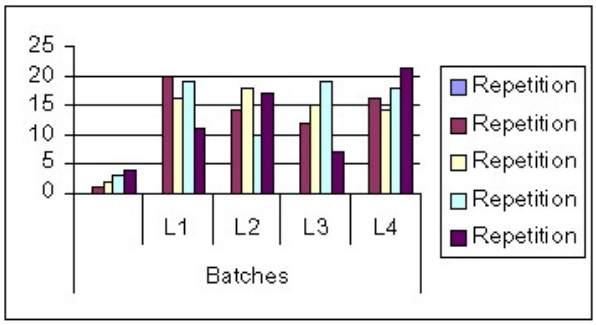

Figure 2: Number of germinated cores of Oleastre

For the test realized with cores of Oleastre the best rate of germination is obtained for the witness followed by the cores of the first batch. Statistical analysis of our results uses a simple statistical method, analysis of the variance with only one parameter of classification, shows us that the probability (proba = 0,0003) is lower than the 1/1000 thus differences are very highly significant following what us kids the assumption of egality of the averages.

The failure of the sowing of the cores of the Chemlal variety, misled in water during 8 days, can be explain by the fact that the embryon tightened private of oxygenat the time of the steeping of the cores in water. According to some authors [3,5,9] in soaked seed, the oxygene cannot arrive to embryon only by the solution of imbibition water.

Out we know that the solubility of oxygene decrease with fur and as the temperature increases [2], like as the case of the Chemlal variety observed by Hamlat [7]. Côme [5] also observed that when the temperature increases, the oxygene dissolved in imbibition water of the envelopes decreases, whereas the needs for embryon increase following the metabolism which becomes intense. In the case of the cores of the variety Chemlal, not misled before hand in water, we note that the hormone has a highly significant effect on the amelioration of the rate of germination. The best rate of germination corresponds to the concentration of 10-4 and 10-5 g/l respectively of 47% and 45%. Thus the pre hormonal treatment by GA3 increases the rate of germination. The assumption selected, it's that hormone GA3 supports the germination of the cores of the olive-tree, variety Chemlal, and checked [6]. In the case of Oleastre the rate of germination of the cores is high for each batch in spite of the small differences recorded between the batches. The average rate of germination was 61,7%.

CONCLUSION

In the case of the cores of olive-tree, *Olea europea* L, Chemlal variety, the steeping of the seeds haven't effect on germination. Could the phenomenon can be explain by the fact that the endocarpe soaked in water at relatively high temperatures (30°C - 35°C) constitutes an obstacle, preventing the oxygene arriving to embryon and consequently from germinating. For the cores not misled in water the results obtained are satisfactory: 47% and 45% for a concentration of 10-4 g/l and 10-5 g/l of GA3. We concluded that Gibberelic acid, very significantly improves the capacity of germination of the seeds of the Chemlal variety which germinates with difficulty. Being given that Gibberelic acid raises embryonic dormancy, we can deduce that the core of olive-tree (*Olea europea* L) Chemlal variety suffers a embryonic dormancy. Utilisation of cores of Oleastre to small gauge us A made it possible to note the existing relation between the gauges and the rates of germination. With a rate of 61,7% of germination we conclude that the cores of small gauge (case of Oleastre) germination is higher than the cores large gauge (case of the Chemlal variety).

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