THE ACCLIMATIZATION OF AFRICAN VIOLETS EXVITROPLANTLETS IN SUBSTRATUM CONSISTING IN SAWDUST

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Abstract. We studied the rooting process of *Saintpaulia exvitroplantlets*, during their acclimatization to septic medium, using as substratum culture unconventional materials, such as: beech (*Fagus sylvatica*) or poplar (*Populus tremula*) sawdust, or „Top soil", a soil obtained in a particular biobase by Vitavert Ltd. (from Stei City), resulted from worm compost produced by an earthworm culture.

Key words: *Saintpaulia ionantha, exvitroplantule, aclimatizare, rumegus*

INTRODUCTION

Sawdust is obtained by cutting logs with saw or sawmill especially in timber yard. As substratum sawdust represent a loose structure, which contain mineral salts in 0,5-2%, pH is usually placed under 6, and have a good capacity to retain water by lignin and cellulose soaking. Chemicals and physicals quality of sawdust depend on tree type and his decomposed level (Selaru 1995).

Using sawdust, as culture substratum, in exvitroplantlets acclimatization phase to septic environment, with a view to obtain – with minimal loses – in sort time as possible, vigorous plants with less expensive means. The final result is a cheap planting material (Cachita et al. 2004).

African violets are sensitive at medium substratum, which consist in soluble salts (Selaru 1995). As regarding "ex vitro" culture conditions of "in vitro" regenerated plantlets were made various experiments to determine optimum substratum mixture to obtain a maximum survival rate of this plantlets. Were tested different combinations between this substratum types: soil, organic compost, carbonised rice shell and sand. Following these experiments it was conclusioned that the mixture of organic compost with sand, in 1:1 proportion, was most propitious to obtain plantlets with low costs. Although is preferred a porous mixed substratum well desiccated. Most violets must grow up in an abundant mixture with organic substances, optimum pH is 5,5 - 6,5. Growth medium must be between 50 – 80% (Selaru 1995).

From different substratum tested types: perlit, mineral wool, "Worm manure" and "Top soil" (both produced by Vitavert Ltd., placed in Stei City, Bihor, Romania), which was used to acclimatization of *Saintpaulia* vitroplantlets (Vancea & Cachita 2002), has found that commercial substratum "Worm manure", equally mixed with peat, was the best.

MATERIAL AND METHOD

Vegetal material has consisted in *Saitpaulia ionantha* vitroplantlets, which was "in vitro" regenerated from propagules cultures, on solid culture medium, the base medium (MB) Murashige-Skoog (MS) (1962), without growing fitoregulators and glycerine, with 20 g/l saccharose addition, vitamins (tyamin HCl, pyridoxin HCl and nicotin acid, 1mg/l each), 100 mg/l meso-inositol and 7 g agar-agar, the medium was proportioned 50 ml each in recipients, pH was adjusted before sterilization at 5,5. Vitroculture was realised in colourless vessels, which was 12 cm high and 7 cm diameter.

Medium culture were sterilised at 121^{o}C temperature (1 atm pressure) by autoclavation about 25 minutes. After inoculation the cultures were exposed at 22±2^{o}C at day and 20±2^{o}C at night and a photoperiod about 16/24 hours. Culture illumination was realised with fluorescent lighting tubes with white light and a bright intensity of 1700 lx.

Before acclimatization, new-formed vitroplantlets presented a 1,5 - 2 cm waist, 4 - 5 leaflets.

Studding rhisogenesis process at *Saintpaulia* exvitroplantlets level, for 30 days from planting them "ex vitro", were tested the efficiency of 4 substratum types (used by us also at *Cymbidium* and *Chrysanthemum*)(VANCEA & Cachita 2001; VANCEA et al. 2003):

A - poplar sawdust;

B - beech tree sawdust;

C - equally mixed of poplar sawdust and beech tree sawdust;

D - equally mixed of poplar sawdust, beech tree sawdust and "Top soil".

When was transplanted, to avoid hydric shock, *Sainpaulia* plantlets were placed in rigid plastic boxes (adapted by us as acclimatisation incubator). In the basis of these boxes is a tray with 30 cm long, 20 cm breadth and 7 cm high, which contain the planting substratum that interested us. This tray is covered with two arched colourless plastic slide lids with 20 cm high.

After 4 days from "ex vitro" transferring regenerated plantlets from cultivated propagules in septic environment, daily – tree hours on day- was realised culture ventilation by opening those lids.

Plantlets were daily watered, with usual rob water (laboratory temperature), and after 7 days of "ex vitro" transferring was administered nutritive solution, consisted in macroelements solution Murashige – Skoog (1962). This treatment was applied to all four substrates, in equal concentrations of 250 ml nutritive solution, at 3 days interval, for 4 weeks.

After two weeks from "ex vitro" transferring of exvitroplantlets it was possible for a final culture decopertation, these exvitroplantlets are already adapted to a normal life conditions.

In the moment when the *Saintpaulia* plantlets were planted we made biometrisations. Biometrisation measurements were repeated after 30 days and consisted in waist determination and leaflets counting. Also it was calculated the survival rate. Mathematic average of measurements was made, to every variant, at 30 days and it was reported at recorded values in the moment of vitroplantlets planting in culture substratum.

RESULTS AND DISCUSSIONS

The surviving percent of African violets (Fig. 1), at septic environment conditions, was superior (80%) at the lot which is planted in poplar sawdust (A). Beech tree sawdust had a negative effect on this exvitroplantlets species, the surviving rate was only 15% (B), and gentle higher values (35%) in the case of poplar and beech tree sawdust mixture, 1:1 report (C), and 75% if is added "Top soil" (D).

Rhisogenesis, expressed by the length and number of roots (Fig. 1), was clearly superior to those exvitroplantlets which were acclimatisated on poplar sawdust substratum (A), presenting the highest efficiency, 103%, as regarding the length of roots and 4% to the roots number, reported to the moment of removing from „vitro" and planting them on substratum. In the aspect of roots genesis beech tree sawdust substratum (B) had an inhibition effect to the rhisogenesis process. On this type of substratum had survived only those exvitroplantlets with a strong root system, neo-formed „in vitro" (Fig. 1). As regarding the roots length growth, the greatest deficiency (21%) was recorded when the exvitroplantlets were placed in an mixture consisting in poplar and beech tree sawdust 1:1 proportion (C). By adding to this mixture a part of "Top soil", was succeeded improving the rhisogenesis and was recorded 41% spore of root length, as regarding to the first accommodation day.

An similar situation was recorded in the case of total leaflets number to, which had have 117% and 73% gains, at exvitroplantlets lots placed in poplar sawdust (A), respectively equal mixture of poplar sawdust, beech tree sawdust and "Worm manure"(D). This fact is caused especially to the higher numbers of leaflets with 1.0 – 1.4 cm diameter (with gains of 219% and 220%), those leaflets existed only to this two lots (A and D) (Fig.1).

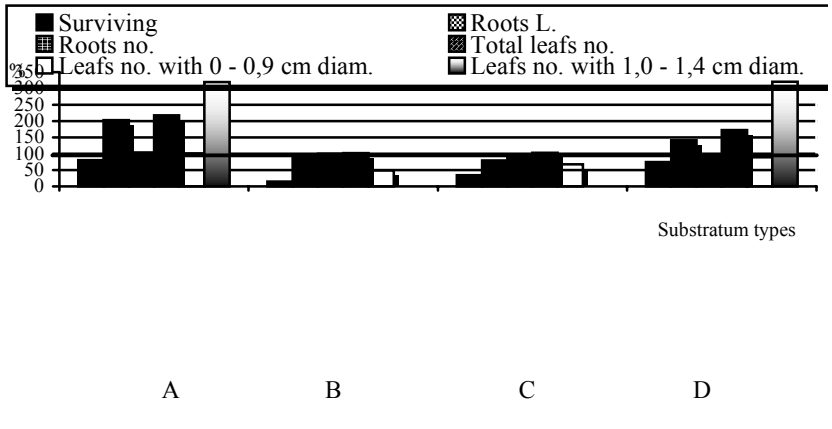

Fig. 1 African violets exvitroplantlets growth (*Saintpaulia ionantha*), at 30 days from their transferation "ex vitro" (biometrical values were reported in the moment of acclimatisation and were considered as reference values 100%), depending on root substratum: A – poplar sawdust; B – beech tree sawdust; C – equally mixture of poplar and beech tree sawdust; D – equally mixture of poplar sawdust, beech tree sawdust and "Top soil".

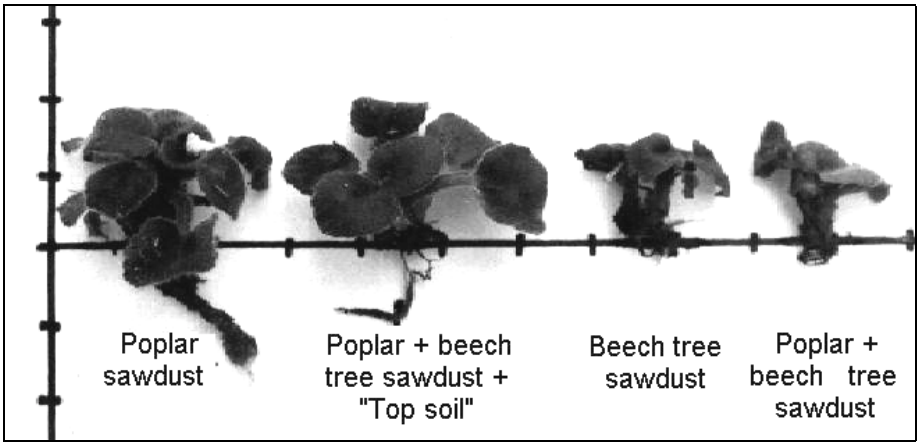

Fig. 2 African violets exvitroplantlets (*Saintpaulia ionantha*), at 30 days fron transferring them on septic medium environment, on other types of substratum: A – poplar sawdust; B – beech tree sawdust; C – equally mixture of poplar and beech tree sawdust; D – equally mixture of poplar sawdust, beech tree sawdust and "Top soil".

CONCLUSIONS

1. In case of African violets exvitroplantlets (*Saintpaulia ionantha*), optimum acclimatisation substratum, from those that were tested in this experiment, was proved to be poplar sawdust, which has permitted, thought a higher porosity, "ex vitro" development of root system, able to absorb water and mineral salts. This had an effect to survival and growth rate of plantlets, superior to other lots, but the equally mixture of poplar sawdust, beech tree sawdust and "Top soil" to, and this has conduct to survival values closer to maximum and growth indexes superior to first acclimatisation day.

2. Beech tree sawdust had exercised a harmful effect to African violets exvitroplantlets; their survivor was extremely reduced. Adding poplar sawdust determined a smaller aggressiveness of beech tree sawdust.

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