

EFFECT OF SOME COMBINED THERAPIES ON PVY AND PVX INFECTED POTATO PLANTLETS (CV. ROCLAS)

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Introduction

Elimination of PVY and PVX from potato supply is essential for seed potato production. Also, in this study, the efficiency of some techniques (chemotherapy, treatments with *Satureja hortensis* oils, hydrogen peroxide, ascorbic acid, electrotherapy) in decreasing the infection level of PVY and PVX infected plants and producing virus-free plants (cultivar Roclas) was evaluated. At the same time, the behavior of the treated plants and their chlorophyll content were researched.

Materials and Methods

Plantlets (variety Roclas) obtained from PVY (PVYo) and PVX infected material (mechanically inoculated) were used in the experiments. Electrotherapy was applied in 4 variants: the infected plantlets were exposed to either 50 or 100 miliampers (mA), for 10 and 20 minutes, washed, divided into single node cuttings and multiplied in vitro. Chemotherapy was undertaken with ribavirin (RBV) and oseltamivir (OSMV) (RBV 40 mg l⁻¹ + OSMV 40mg l⁻¹). *Solanum tuberosum* L. plantlets regenerated were removed from the culture medium, acclimated in green house and with *Satureja hortensis* essential oils suspensions, H₂O₂ 1mM pH 5.6, ascorbic acid 3mM pH 5.6 treated (spraying twice weekly). The survivor plants were indexed (DAS ELISA). The variant leading to high rates of both virus elimination and plant regeneration was estimate using the Therapy Efficiency Index (TEI) [1, 2]. For chlorophyll content determination of regenerated healthy plants a portable SPAD 502 (Chlorophyll Meter) was used.

Results

Electrotherapy (100 mA, 10minutes) applied to infected plantlets, chemotherapy (RBV40mg l⁻¹ OSMV40mg l⁻¹), *Satureja hortensis* EOs essential oils treatments of acclimatized plants led to the highest rate of virus eradication, the maximum values of the therapy efficiency. *Satureja hortensis* EOs and hydrogen peroxide (1mM) or ascorbic acid (3mM) treatments of acclimatized plants increased the therapy efficiency index (TEI) in all the variants, having beneficial effects on the plants obtained by chemotherapy from PVY and PVX infected potato plants. This effect was stronger when the therapies were applied to material infected with PVX. Regarding the chlorophyll content, all the regenerated plants from infected material treated 10minutes with electric current (100mA), had higher values than the negative control (healthy plantlets untreated).

Conclusions and Perspectives

This preliminary study revealed that applying combination of electrotherapy (100 mA, 10minutes) chemotherapy (40mg/l RBV + 40mg/l OSMV), followed by treatments with *Satureja hortensis* essential oils of acclimatized plants could have beneficial effects on PVX and PVY elimination from potato plant tissues. Some elements remain to be tested and/or improved in the future: the phytotoxicity of the treatments has to be verify; to define the efficiency of the treatments with bulked samples is required.

References

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