

Effect of Titanium-Ascorbate as a Stress-Decreasing Agent on *Hosta In Vitro* Cultures

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SUMMARY

In recent work the effect of titanium-ascorbate named Titavit, a yield increasing and conditioning agent in *in vitro* cultures of *Hosta* genotype 'Dew Drop' was examined. Former examinations confirmed the stress decreasing effect of this material. Stress processes caused by abiotic factors can be followed up by measuring the changes in the stressenzyme activity.

The *Hosta* cv 'Dew Drop' cultures were maintained on half-strength MS medium supplemented with 1 mg l⁻¹ benzyl-adenine containing Titavit in the following concentrations: 0.1 mg l⁻¹, 0.3 mg l⁻¹, 0.5 mg l⁻¹, 0.7 mg l⁻¹. The effect of these Titavit concentrations were also examined without any other growth regulating agents. Peroxidase enzyme activity (U/ml), antioxidant capacity (mMAS/l) referred to ascorbic acid, chlorophyll content (U/ml) and the number of developed shoots, roots, the width of leaves and height of the plants were measured in the evaluation. For the measuring of POD enzyme activity samples originated from foliage and root were crushed in Na-acetate puffer (pH=4.5) using quartz stand. The puffer contained 1% polyvinylpyrrolidon, 20% saccharose, 0.035% bovine serum albumin and 10% Triton X100. The samples were precipitated using MSE Mikro Centaur desktop centrifuge for 15 minutes at 4°C, 13000 rpm. POD enzyme activity was measured spectrophotometrically in the supernatant in the presence of H₂O₂ substrate using ortodianizidine as a chromogen reagent ($\epsilon = 11.3$) according to Shannon (1966). Antioxidant capacity was measured according to Benzie and Strain (1966). For the measuring of the chlorophyll content the samples were homogenized and dissolved in 80 v/v% acetone. After centrifugation the absorbancy of supernatant was measured at the wavelength of 644 nm and 663 nm.

Titavit had positive effect on the formation of leaves and roots in the case without any other growth regulating agents especially with the concentration of 0.5 mg/l, but not on the initiation of shoots. Whereas media without Titavit caused higher proliferation, but the root formation was missing. The POD activity was different in foliage and in roots. According to the results of POD activity, Titavit had a stress decreasing effect in the leaves. Higher antioxidant capacity was measured after the treatment in the leaves as well in the roots. Also the medium supplemented with 0.5 mg/l Titavit effected the best chlorophyll content. Titavit can be a potentially recommended medium supplement in the *in vitro* cultures of *Hosta* sp.