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Towards the SDG Challenges

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lar dehydration and polymerization processes).

METHOD / DESIGN:

A central composite design was employed to evaluate the four selected variables, i.e., reaction time, liquid to solid ratio, temperature, and H_2SO_4 concentration) for the determination of the optimum dilute acid hydrolysis conditions, in order to maximize the total sugars yield. The experiments were designed using the statistical software package Design Expert (Release 6.0.8). Sugar concentration was determined as glucose equivalent spectrophotometrically using the phenol-sulfuric method and the total sugar yield (Y_{TS}) was calculated according to the equation:

$$Y_{TS} = C_{TS} V_H / m_{dSCG} \times 100$$

Where C_{TS} is the total sugar concentration obtained from the calibration curve, VH is the hydrolysate volume and m_{dSCG} is the mass of the initial dried SCG before hydrolysis.

RESULTS:

Regression analysis was used to identify the influence of the independent variables on the sugars yield. In the final model, the non-significant factors ($p > 0.05$) were excluded from the model, which thus contains the linear effect of time (X_1), temperature (X_3), and H_2SO_4 concentration (X_4), as well as the quadratic effect of liquid to solid ratio (X_2). The following regression equation was obtained:

$$Y_{TS} = -51.27+0.05X_1+3.37X_2+0.43X_3+2.12X4-0.16X_2^2$$

The determination coefficient (R^2) of the proposed model was 0.816 ($p < 0.001$).

CONCLUSIONS:

Mild conditions for SCG acid hydrolysis pretreatment proved to be an efficient method for the extraction of hemicellulose type carbohydrates (soluble sugars). Response Surface Methodology (RSM) was successfully implemented to optimize the conditions of the process (i.e., reaction time, liquid to solid ratio, temperature, and H_2SO_4 concentration) and allowed the rapid screening for a large experimental domain. According to the analysis, maximization of the sugar yield can be obtained at 149.73 (~150) min, an L/S ratio of 10.25, 90°C, and 3% H_2SO_4. Under these conditions, hydrolysis efficiency reached 73,88% expressed in glucose equivalents, corresponding to an average of 0.1876 $g_{gluc.eq}/g_{scg}$ yield. The optimized process points to new possibilities for SCG's biotechnological valorization through the production of several chemical compounds by chemical and/or fermentation processes.

T2-P-23 The effect of *Trichoderma Spp.* on physiological parameters of two tomato cultivars grown under greenhouse conditions

Mirjana Bojović[54], Igor Vukelić[54], Zorana Srećkov[54], Zorica Mrkonjić[54], Danka Radić[55], Gordana Racić[54], Dejana Panković[54]

KEYWORDS: tomato; *Trichoderma*; greenhouse; non-destructive measurements

INTRODUCTION:

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Fungi that belong to the genus *Trichoderma* colonize plant rhizosphere and are considered as good candidates for the use in environmentally friendly agriculture as plant growth promoters and biocontrol agents. In recent years, investigations are focused on the use of non-destructive characterization of plant responses to different abiotic and biotic stresses.

OBJECTIVES:

Dualex sensor was used in order to pre-screen the reaction of tomato plants treated with different *Trichoderma* isolates, based on the previous investigations that imply that the positive effects of this fungi depend on the plant genotype.

METHOD / DESIGN:

The experiment was conducted in a randomized block design under greenhouse conditions with two replicates. In total 30 plants of two tomato cultivars were transplanted in soil, per treatment: NC-control Narvik, GZC- control Gruzanski zlatni, NT1 - *T. harzianum*; NT2 - *T. brevicompactum*; NT3 - *T. harzianum* + *T. brevicompactum*; GZT1 - *T. harzianum*; GZT2 - *T. brevicompactum*; GZT3 - *T. harzianum* + *T. brevicompactum*). The suspensions of *Trichoderma* isolates were applied in the root zone of tomato plants, in the phase of three established leaves per plant. Measurements of chlorophyll (Chl), flavonols (Flav) and anthocyanins (Ant) content were done in vivo on fully developed leaves of the tomato plants, using Dualex optical sensor (Force-A, Orsay, France), once per week during 50 days of plant growth. NBI (Nitrogen Balance Index) was calculated as Chl/Flav ratio.

RESULTS:

Results obtained in this experiment showed that in both cultivars, the content of chlorophyll did not change significantly after *Trichoderma* application. However, positive trend for Flav content was observed for the cultivar GZ in the treatment with T2. In contrast, at the beginning of the experiment, NBI index decreased in GZ as influenced with T1 and T2 treatments, which could indicate a shift from primary to secondary metabolism in mentioned cultivar. Moreover, it could be noticed that during plant growth content of anthocyanin decreased in both control and *Trichoderma* treatment conditions.

CONCLUSIONS:

In conclusion, we can suggest that use of non-destructive measurements with Dualex sensor could serve as starting point to better understanding of plant responses to *Trichoderma* presence. Moreover, measurements with Dualex can serve as a pre-screening method for testing the effect of larger number of *Trichoderma* isolates and their effect on more different tomato genotypes.

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T2-P-24 Xanthan production on winery wastewaters: optimization of process parameters important for biopolymer quality

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KEYWORDS: Biotechnological production; xanthan; winery wastewater; biopolymer quality; bioprocess optimization;

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