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BOOK OF ABSTRACTS

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Content

OBJECTIVES:

The main objective of our study was to valorize *T. serpyllum* herbal dust by microwave-assisted extraction (MAE) and to evaluate extraction parameters (ethanol concentration, extraction time, liquid-solid ratio and irradiation power) affecting total extraction yield (Y), total phenols yield (TP) and antioxidant properties of obtained extracts. Response surface methodology (RSM) and ANN approaches were applied to optimize antioxidants recovery from *T. serpyllum* herbal dust and comparative analysis in terms of influence analysis, model fitting and optimization accuracy was done.

METHOD / DESIGN:

With the aim of investigating impact of the MAE parameters on target responses and optimizing extraction process, the face-centered central composite experimental design (CCD) with RSM and ANNs were used. The impact of ethanol concentration (45, 60 and 75%), extraction time (5, 12.5 and 20 min), liquid-solid ratio (10, 20 and 30 mL/g) and irradiation power (400, 600 and 800 W) were used as input parameters in both cases. As responses were selected Y, TP, as well as antioxidant activity parameters obtained by DPPH and ABTS assays.

RESULTS:

Optimized MAE conditions obtained by RSM were ethanol concentration of 52%, 20 min extraction time, 24 mL/g liquid-solid ratio and irradiation power of 400 W. On the other hand, optimized MAE conditions obtained by ANN were ethanol concentration of 45%, 5 min extraction time, 30 mL/g liquid-solid ratio and irradiation power of 400 W. Based on values of R^2 of RSM obtained for Y, TP, DPPH and ABTS (0.9242, 0.8487, 0.9216 and 0.6661, respectively), and R^2 of ANN where its lowest value, taking into account all four responses, was 0.9507, it could be concluded that there is a good fit between experimentally observed and predicted values.

CONCLUSIONS:

Results suggested that both RSM and ANN approaches could be successfully used for optimization MAE process of polyphenols recovery from *T. serpyllum* herbal dust. It could be also concluded that MAE is an efficient technique for the extraction of biologically active compounds from *T. serpyllum* herbal dust, which represents the high-valuable source of natural antioxidants with great potential for further use in various forms within different branches of industry.

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T4-P-6 Effect of climatic variables and sowing date on winter rapeseed (*Brassica napus L.*) development and yield

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KEYWORDS: climate change; cultivar x environment interaction; growth stage; winter rapeseed; seed yield.

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INTRODUCTION:

Climate change differentially affects crops, since the effects are caused by combination of changes in growing conditions and the timing of phenological phases. Winter rapeseed is vulnerable to local climatic conditions because of its lengthy growth period and overwintering ability. The information on the cultivar x environment interaction provides valuable data to plant breeders and agronomists for the identification of superior cultivars in specific environments, and defines site-specific best management practices. A further step in the cultivar (C) and year (Y) interaction analysis (C x Y) for rapeseed, would be to investigate the effect of specific climatic variables throughout developmental stages. Such data could be used to dissect the year effect and determine which variables are the most significant for an optimal plant development at each growth stage. The effect of climatic variables on the winter rapeseed developmental stages and yield in Southeast Europe has not yet been analysed simultaneously, although their interaction is important to breeders and growers.

OBJECTIVES:

The aim of the study was to understand year-related interactions and the effect of climatic variables in different growth stages on seed yield and oil content.

METHOD / DESIGN:

Sources of variability for the seed yield and oil content of four rapeseed cultivars were evaluated, during the four growing seasons, under the influence of three sowing dates. Six climatic factors: the temperature (minimum on 5 cm above ground; minimum; maximum; and mean), total precipitation, and relative air humidity, were observed during the germination, over-wintering, budding, flowering and ripening.

RESULTS:

A Wald F test showed a highly significant effect of C × Y for both, the seed yield and oil content. The treatment × year (T × Y) interaction was significant for the oil content. A set of individual factorial regression models was developed in order to test the hypothesis about the effect of climatic variables on C x Y and T x Y interactions. Out of thirty available climatic variables, nineteen had a highly significant effect on the C x Y interaction for the oil content and six variables had a significant effect. The largest proportion of the explained interaction variance was obtained for precipitation at the budding stage (60.3%), the maximum temperature at overwintering (60.2%), and the relative air humidity at flowering (59.0%). As a consequence of the decreased level of significance of the T x Y interaction for the oil content, only three climatic variables were found to be important. A highly significant effect was observed only for precipitation at overwintering (81.4%), whereas the effect of the relative air humidity at the budding stage (76.4%) and precipitation at the germination stage (61.1%) accounted for a significant proportion of the T x Y interaction.

CONCLUSIONS:

The study successfully dissected the effect of year-related climatic variables on the agronomical traits in winter rapeseed.

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