

DOKTORSKÝ STUDIJNÍ PROGRAM/*DOCTORAL STUDY PROGRAM*

VYPSÁNÍ TÉMATU/*LISTING OF TOPIC*

Studijní program/*Study Program*: **Nutrition and Food**

Studijní obor/*Branch of Study*: **Program without field**

Katedra/*Department of*: **Chemistry**

Školitel, email/*Supervisor, email*: **doc. Ing. Petr Kačer, Ph.D., kacerp@af.czu.cz**

Konzultant/*Co-supervisor*: **Prof. Ing. Jaromír Lachman, CSc.**

Forma studia/*Form of Study*: **Full_time**

Typ tématu/*Type of Theme*: **Framework**

Téma/Topic: Potential health benefits of stress-induced secondary metabolites in colored grain wheat (*Triticum aestivum* L.)

Hypotézy/Hypotheses:

- 1) Grains of selected wheat varieties will contain stress-induced metabolites that will exhibit antioxidant activity
- 2) The relationship between stress tolerance of the analysed set of wheat varieties and the content of important biologically active metabolites and antioxidants in wheat grains will be determined.

Abstract: The antioxidants contained in wheat grains of colored varieties (phenolic acids, alkylresorcinols, anthocyanins, flavonoids and carotenoids) are important health-promoting substances, some of which may also be important in the mechanism of wheat resistance to abiotic and biotic stresses. From this point of view, it is important for practice to evaluate the range of coloured and uncoloured wheat varieties, to determine their possible relationship and influence on resistance and the ability to increase the content of bioactive compounds due to stress. Phenolic compounds, carotenoids and tocopherols, among others, are among the natural substances with antioxidant properties, but they are themselves easily degraded. These processes are significantly accelerated by various external (presence of oxygen, UV radiation, high temperature, extreme pH values of the environment) but also internal factors (e.g. action of certain enzymes). In order to maintain the desired content of biologically active substances, including antioxidants, in the resulting food products, their initial concentration in the starting material is essential, as is the limitation of losses due, inter alia, to the action of certain processing steps. The task will be to determine the content of biologically active substances in selected varieties, lines and genetic material of wheat, the possibility of their influence due to stress. Varieties, lines or genetic material with high content of selected metabolites in terms of healthy nutrition of the population and will be important in the resistance of varieties to abiotic and biotic stresses, may affect the quality of food produced. The genetic material will be provided in cooperation with the Agricultural Research Institute Kroměříž and VÚRV Praha Ruzyně, v.v.i. Determination of antioxidants and metabolites will be carried out by HPLC-DAD / HPLC-MS, GC-MS and FID, spectrophotometric and possibly other analytical methods.

Zdroje financování práce/*Funding Sources*: research project NAZV QK QK1910343

V/*In* Praze

Podpis/*Signature*:

dne/*Date*: 20.01.2022