

**Comparative Study of Phenolic Complex *in vitro* Cultures of Species  
*Linum Usitatissimum* and *Linum grandiflorum***

Ewgenia GONCHARUK

Group of Phenolic Plant Metabolism, Institute of Plant Physiology,  
Russian Academy of Sciences, Russia, Moscow.

*goncharuk.ewgenia@yandex.ru*

**Aim of the study:** Currently, a variety of varieties flax, finds application in many industries, pharmacology, food industry, as well as in the field of landscape and decorative planning and design. The regions of flax cultivation are susceptible to a number of abiotic, biotic, anthropogenic stressors, the resistance to which is determined by the presence of effective antioxidant systems represented in plants by both enzymatic and non-enzymatic antioxidants, to the group of which phenolic compounds also belong. Many aspects of the peculiarities of the phenolic complex of flax of various species have not been sufficiently studied and studies in this direction are of considerable interest in connection with the prospects for the integrated use of various species of this culture. *In vitro* cultures allow to reveal tendencies of accumulation of phenolic compounds also characteristic for intact plants, therefore, callus culture of flax as a convenient object of biotechnological research was the object of study.

**Materials and methods:** The object of the study was callus cultures of flax fiber (*Linum Usitatissimum*), flaxseed oil (*Linum Usitatissimum*) and flax ornamental (*Linum Grandiflorum*). For the production of callus tissue, hypocotyl segments isolated from sterile shoots were placed on the agarized Murashige-Skuga nutritional medium containing 2,4-D. Cultivation was carried out in the climatic chamber at a temperature of 25 °C, a relative air humidity of 70% and 16 hours. Photoperiod (light intensity 3 000 lux), within 30 days. Total content of the phenolic compounds was determined with a Folin-Denis reagent at 725 nm, the content of flavonoids with a 1% aqueous solution of aluminum chloride at 415 nm, and the content of phenylpropanoids by direct spectrophotometric analysis of the extracts at 330 nm.

**Results:** Callus cultures of flax fiber stood out in the greatest capacity for the accumulation of phenolic compounds, which is probably determined by the specific features of the cellular and tissue structure of the lub-fiber cultures. In the phenolic complex of the three flax varieties studied, phenylpropanoids predominated, as the most characteristic representatives of phenolic compounds for this culture. The content of flavonols in the phenolic complex was insignificant in all studied objects of the study; however, in the proportion to phenylpropanoids in flax, the decorative share of flavonols was the most close to them. Thus, along with the general tendencies in the accumulation of phenolic compounds, certain peculiarities in their share distribution in the cultures of the studied varieties were also expressed, which is probably due to their species specificity.

**Key words:** biotechnology, flax, phenolic compounds.