GENETIC ENGINEERING OF TOCOPHEROL BIOSYNTHESIS IN OILSEED RAPE (BRASSICA NAPUS L.) FOR NUTRITIONAL IMPROVEMENT
INGINERIE GENETIC BIOSINTEZA TOCOFEROL LA RAPIȚĂ (BRASSICA NAPUS L.) PENTRU ÎMBUNĂTĂȚIREA NUTRIȚIONALE

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Genetic modification of oil crops offers the possibility to modify storage lipids and valuable secondary compounds in order to meet specific nutritional and even therapeutic requirements. Due to successful breeding double-low oilseed rape (Brassica napus L.) is highly estimated as food raw material, but further enhancement of its nutritional value and health effects has become more important in the last few years. In this respect tocopherols (TOC), although present in small amounts (500-700 mg tocopherol•kgoil), are important phytonutrients and powerful lipid-soluble antioxidants showing bioactivity as vitamin E and reducing the autoxidation of unsaturated fatty acids, the production of off-flavours and rancidity. Tocopherols occur in rapeseed oil as a
mixture of two predominant forms, a-TOC and γ-TOC, which differ in their bioactivity (vitamin E) and antioxidant properties. In the course of a metabolic engineering approach, the strategy is to elevate tocopherol levels by increasing the flux through the pathway by heterologous overexpression of enzymes that catalyse relevant steps in TOC biosynthesis, such as 4-hydroxyphenylpyruvate dioxygenase (HPPD) and homogentisate phytyltransferase (HPT).