

## INVESTIGATIONS OF SECONDARY METABOLITES IN FLAXSEED CALLUS CULTURE IN VITRO AND RAPESEED

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**Summary.** Flaxseed (*Linum usitatissimum* L.) and rapeseed (*Brassica napus* L.) are investigated in a wide variety of aspects, such as botanical studies, chemical constituents and biosynthesis of secondary metabolites. The purpose: 1) To explore flaxseed “Mikael” and “Gregor” callus formation process in vitro and to identify secondary metabolite cyanogenic glycoside – linamarin. 2) To explore rapeseed “Auksiai”, “Vasariai”, “Kauniaiai”, “Siauliai”, “Sponsor” secondary metabolites – glucosinolates. It were prepared flaxseed sterilization, callus induction and proliferation in vitro. The highest frequency of primary callus induction was by “Gregor” genotype after 28 days. It was ascertained that one callus the best growth was in “Mikael” genotype after 56 days. Flaxseed (*Linum usitatissimum* L.) callus culture diverse growth in the same conditions determined genetic nature. It was determined that linseed callus induction was the most effective in the MS medium with synthetic auxins : 0,5 mg/l NAR, 5 mg/l 2,4D. It was determined, that flaxseed callus cells accumulate of secondary metabolite –linamarin 1,8 times less than flaxseed. Linamarin, a cyanogenic glycoside, will break down to release small amounts of highly toxic hydrogen cyanide, when the seed is crushed and placed in water. The primary site of action of HCN is on the cytochrome system; terminal respiration is inhibited, oxygen starvation occurs at the cellular level and rapid death ensues. Glucosinolates (mustard oil glycosides) are closely related to cyanogenic glycosides and they can also be toxic to animals when they occur in sufficient amount in rapeseed (*Brassica napus* L.). Toxic symptoms include severe gastroenteritis, salivation, diarrhoea and irritation of the mouth. Toxicity is actually due to the release of isothiocyanates, which are highly vesicant in their action. A further hazard of these substances is due to the fact that during their release from bound forms, the produced isothiocyanates can undergo rearrangement in part to the corresponding thiocyanates. The latter substances are harmful, because they are goitrogenic and produce hyperthyroidism in mammals. It was determined, that glucosinolates in rapeseed “Sponsor” are 5,5 mmol/g, “Auksiai” seed – 15,5 mmol/g , “Kauniaiai” seed –22,3 mmol/g, “Vasariai” seed – 21,3 mmol/g, “Siauliai” seed – 14,2 mmol/g.

**Keywords:** callus induction, linamarin, glucosinolates.