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Potential of using the RUBY reporter system in the transformation of *Pisum sativum* and optimization of the selection of transgenic calli

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Motivation and aim: In plant transformation systems, the selection of transformed cells requires the use of marker genes, such as antibiotic resistance or reporter genes. The latter typically necessitate the use of expensive equipment and reagents. Recently, the RUBY reporter system was proposed, which is based on the synthesis of enzymes that convert tyrosine into the bright red pigment betalain [1]. The advantage of the RUBY system is the possibility of non-invasive visualization of transgenic tissue *in situ* without the use of specialized equipment or expensive chemical substrates.

Legumes, including peas, are susceptible to Agrobacterium-mediated transformation. However, unlike many other species, the regeneration of whole plants from transformed pea cells under *in vitro* conditions presents significant difficulties [2]. The use of somatic embryogenesis regulators may help solve this problem. A reliable system enabling the production of transgenic pea callus tissues is required for the systematic search and evaluation of such regulators.

Materials and methods: In our experiment, seeds of a pea cultivar "Jaguar" were taken. The seeds were kindly provided by the "NOVA PLANT" company. For pea transformation, *Rhizobium radiobacter* (*Agrobacterium tumefaciens*) AGL1 strain was used, which was transformed with the pHDE_RUBY plasmid for the RUBY overexpression. For shoot apices transformation, we used a method from [3]. For cultivation explants we used MS-mod medium [4].

Results: During the experiment, conditions were found intensifying the coloration of transgenic calli, which helps to select them.

Conclusions: We investigated the efficiency of the RUBY system for pea transformation and optimized the conditions for selecting transgenic explants.

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