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# **BOOK OF ABSTRACTS**

*XII International Scientific  
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"AGROSYM 2021"  
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## **BLUE LED LIGHT PROMOTES SOMATIC EMBRYOGENESIS FROM THE LATERAL ROOTS SECTIONS OF SPINACH (*SPINACIA OLERACEA* L)**

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### **Abstract**

Light and gibberellins (GAs) are essential for the induction of somatic embryogenesis in spinach. In the present study, the influence of light of different spectral qualities on the induction of somatic embryogenesis from the apical root sections of spinach seedlings was tested. The explants grown under blue light (B, emission maximum at 460 nm), provided by Light-emitting diodes (LED), exhibited the highest regeneration frequency (57.8%±0.36) and the mean somatic embryo (SE) number per explant (5.02±0.04) for eight weeks of cultivation on SE-induction medium supplemented containing 20 µM  $\alpha$ -naphthaleneacetic acid and 5 µM GA<sub>3</sub>. The explants cultivated under white (W, 300-720 nm) LED or light provided by fluorescent lamps (FL, 380-680) produced a two times lower number of SEs per explant, while the explants grown under red (R, 630 nm) LED light or in darkness (D) failed to regenerate SEs. Considering that light greatly affects the level of GAs in plant tissues, and GAs are indispensable for SE induction in spinach, the expression profiles of genes encoding the key enzymes that catalyze the final steps of bioactive GA biosynthesis (GA20-oxidase and GA3-oxidase) and inactivation (GA2-oxidase) were tested in the explants grown under B, W or FL light. Surprisingly, no significant differences in the expression levels of these genes were observed among the treatments during of SE induction, indicating that light triggers SE induction by other mechanism, not including alterations in the expression of the aforementioned genes. Further research is needed for better understanding of the mechanism of SE induction by light.

**Key words:** *spinach, somatic embryogenesis, gibberellins, LED lights, gene expression.*