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Response of mature somatic embryos of hybrid larch *Larix eurolepis* to cold and desiccation treatments

Kateřina Eliášová¹, Parisa Savane^{2,3}, ¹Petre I. Dobrev¹, Zuzana Vondráková¹, Václav Motyka¹, Caroline Teyssier², Marie-Anne Lelu-Walter²

¹ Institute of Experimental Botany of the Czech Academy of Sciences, Prague, Czechia

² INRAE, ONF, BioForA, UMR 0588, F-45075 Orléans, France

³ Curent affiliation : Amatera Biosciences, 4 rue Pierre Fontaine, F-91000 Evry, France

eliasova@ueb.cas.cz

ABSTRACT

Somatic embryogenesis of conifers yields somatic embryos (SEs) that closely resemble fresh zygotic embryos (ZEs). Much effort has been devoted to improving the biochemical composition of SEs and reducing their water content, bringing SEs closer to fully mature zygotic embryos. Of the approaches used to achieve this goal, the most common is the cold treatment of SEs or their desiccation at different relative humidity (RH).

Experiments were conducted with two embryogenic lines of hybrid larch (*Larix eurolepis*). Mature cotyledonary SEs, after 8 weeks of cultivation on media with abscisic acid (ABA), were either exposed to cold (+4 degrees) for a week or treated with 98% or 59% RH for a week or their combination (a week at 98% RH plus a week at 59% RH) at +4 degrees. After treatments, phytohormones were analysed in an LC/MS system coupled to a Triple Quadrupole Mass Spectrometer and histological analysis of SEs was performed to detect starch grains and storage proteins.

We focused on changes in the content of ABA and its derivatives. The total amount of ABAs differed between the lines, but cold treatment and desiccation at 59% RH led to an increase in the content of free ABA or total ABAs, resp. in both of them. On the contrary, desiccation at 98% RH and 98% + 59% RH caused a marked decrease in free ABA. Histological analysis revealed a reduction in starch grains after desiccation at 98% RH and 98% + 59% RH, but not after desiccation at 59% RH or cold treatment.

Keywords: somatic embryogenesis, *Larix eurolepis*, desiccation, phytohormones, histology