

ABSTRACT

Somatic embryogenesis represents one of the possible methods of vegetative propagation in conifers, especially when traditional propagation ways fail. Several persistent problems prevent the wider use of this technology on a large scale (e.g. low number of high-quality somatic embryos (SE), limited stability of embryogenic capacity of cultures and many others), and even in relatively well experimentally mapped species.

In order to contribute to the elimination of some weak points associated with this method, I studied the effect of change in the applied aromatic cytokinins during proliferation. I replaced usually used 6-benzylaminopurine (BAP) with its hydroxylated derivative - *meta*-topolin (*mT*). Literature data indicate that this substitution might represent a promising change that could have solve some of problems, e.g. insufficient number of somatic embryos formed or common problem with aging of embryogenic cultures.

I worked with a stable, well-growing embryogenic line of Norway spruce (*Picea abies* (L.) Karst.) derived by our team (line C). I performed the detailed description of the line C development with the conclusion that it showed good embryogenic capacity along with a number of other characteristics common to the lines that were used as model ones in the past. For this reason, it is very likely that the response of this line to altering of applied cytokinin would have a wider validity, and thus a possible practical use.

In this work, a significantly higher yield of SE was found in connection with the application of *mT* compared to BAP. Moreover, no negative effects related to *mT* application on the development of SE during maturation were observed. The performed analyses showed that the increase in yield was accompanied by a change in monitored antioxidant systems (ascorbic acid and glutathione) and was also reflected in a slight change in the speed of SE development. During the work, the importance of cytokinin replacement in the proliferation for performance in the subsequent maturation was confirmed, though the maturing culture was no longer exposed to the cytokinin application.

Key words: 6-benzylaminopurine, aromatic cytokinins, maturation, *meta*-topolin, Norway spruce, proliferation, somatic embryogenesis