**Identification of an effective carbon source for *in vitro* regeneration and mass production of pomegranate (*Punica granatum* L.) plantlets**

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**Abstract**

This study aims to identify an effective carbon source in each micropropagation stage of Punica granatum L., which is an important autochthonous species in Albania, distinct for its nutritional, antibacterial, and antimicrobial attributes. Zygotic embryos were used as primary explants, exceeded from mature pomegranates seeds of Devedishe variety. After sterilization, the explants were inoculated in WPM medium supplemented with kinetin at 1 mg l-1, 6-benzylaminopurine (BAP) at 1 mg l-1, and 1-naphthaleneacetic acid (NAA) at 0.1 mg l-1 for the stimulation of proliferation and in vitro shoots regeneration. After mass production of plantlets via subcultures, the shoots were inoculated in WPM nutrient medium supplemented with indole-3-butyric acid (IBA) at 1 mg l-1 for rhizogenesis induction. In each stage, four types of carbon sources were tested, specifically glucose, sucrose, mannitol, and table sugar, at 3% each of them. There were observed significant differences in terms of biometrics parameters influenced by the carbon source. During the proliferation and subculture stage, the best results were obtained in glucose-containing media, followed by sucrose-containing media. For the rhizogenesis induction, the use of mannitol resulted as the most effective for this response. In all stages of micropropagation, the use of the table sugar resulted in the lowest values of monitored parameters, and the growth potential was strongly reduced, but the explants did not show necrosis or other morphologic malformations. Therefore, due to the low cost, table sugar as a carbon source would be quite effective for use in the short- and mid-term conservation programs via minimal growth techniques.

**Keywords:** pomegranate, embryo culture, carbon sources, *in vitro* regeneration