

Increasing of *in vitro* multiplication rate of sugar beet using periodical bioreactor

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Abstract

Selected genotypes of sugar beet are often maintained by conventional propagation, but much faster rates of multiplication can be now obtained through micropropagation. On the other hand, plant micropropagation using bioreactors can decrease the cost of production and makes it an economical method. In this research, the possibility of using bioreactor and optimization of the tissue culture procedure in sugar beet micropropagation was studied. A simple periodical bioreactor was made by using a timer, air pump, microfilters (0.2 μ), and air and medium autoclaveable transfer pipes. *In vitro* stock plantlets from seeds and liquid MS basal medium supplemented with 1.5 mg.l⁻¹ BAP, 0.2 mg.l⁻¹ NAA, 0.5 mg.l⁻¹ GA₃, and 3% sucrose were used for inoculation and multiplication in the bioreactors. Periodical nutrition of the explants established for 10 minutes every 6 hours. The same basal medium with 3 mg.l⁻¹ IBA was used for root induction. Bioreactor system was compared with routine *in vitro* procedure in tissue culture laboratory. Results showed that the bioreactor system multiplication rate, number of shoots, and biomass production was significantly different from routine *in vitro* culture in 100 ml jars. Rooting percentage in bioreactor was very low and needs more study to optimization.

Key Words: Sugar beet, Periodical Bioreactor, Micropropagation, Economical method

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