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Establishment of Cell Suspension Cultures and Plant Regeneration in Sugar Beet (*Beta vulgaris* L.)

Songül GÜREL

Sugar Institute, Plant Breeding Department, Etimesgut, 06790 Ankara - TURKEY

Ekrem GÜREL

Abant İzzet Baysal University, Department of Biology, 14280 Bolu - TURKEY

Zeki KAYA

Middle East Technical University, Department of Biology, 06110 Ankara - TURKEY

 [Keywords](#)
[Authors](#)



bot@tubitak.gov.tr

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Abstract: The establishment of cell suspension culture from the callus of sugar beet (*Beta vulgaris* L.) breeding lines and plant regeneration from suspension-derived callus are described in this study. Using different concentrations and combinations of BAP and 2,4-D, the growth patterns of cell suspension cultures were examined during a range of culture periods (0, 3, 5, 7, 9, 11, 13 and 15 days). In all lines, the growth rates of cells were initially slow but as the culture proceeded, they increased significantly and accumulated great amounts of biomass over a period of 15 days. Medium containing high BAP (0.25 mg/l) and 2,4-D (0.25 mg/l) induced higher rates of cell division than the medium containing low BAP (0.1 mg/l) and 2,4-D (0.1 mg/l) or the control. A genotypic variation was evident when the mean growth rates of different lines were compared, with lines M114, ELK345, ÇBM315 and M1017 producing a mean rate of 34.8%, 21.5%, 19.2% and 13.4%, respectively. In all lines, approximately 50% of the suspension-derived callus formed shoots when cultured on medium containing BAP and IAA, or TDZ alone. Rooting was readily achieved when shoots were incubated on medium containing 3.0 mg/l IBA.

Key Words: Sugar beet, suspension culture, plant regeneration, breeding lines

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