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Protoplast Isolation in Lupin (*Lupinus mutabilis* Sweet): Determination of Optimum Explant Sources and Isolation Conditions

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Abstract: Effects of cultural factors on the yield, viability and division of protoplasts were investigated in *Lupinus mutabilis* Sweet containing a high protein content as well as a reasonable oil content which may make this species an alternative crop to soybean in Turkey. Explants from different in vitro seedling parts were evaluated on the suitability of protoplast isolation and viability. Leaf mesophyll was the most suitable tissue as a protoplast source. Pectinases as well as cellulases were essential for the isolation of protoplasts. Nine percent (w/v) mannitol was suitable to stabilise osmotic pressure together with low salt concentrations in washing and isolation solutions while 9% (w/v) glucose gave better results in culture medium. Shoot tip protoplasts exhibited a higher viability than other protoplast sources. Prolonged viability was observed when protoplasts were cultured in low density media. Techniques such as nurse cultures and electro-stimulation were ineffective. Sustained division of protoplasts in lupin (all sources) was not possible. However, techniques applied in this study may help other researchers, especially those studying protoplast culture of recalcitrant plant species, as well as further studies on this species.

 [Keywords](#)
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