

Atrazine Resistance in Light Grown Callus
of Lotus corniculatus cv. 'Leo'

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Suspension cultures were initiated according to the method described by MacLean (1986). Callus cultures were grown under fluorescent lights at 30 μM photons/ m^2 /sec light intensity. The resultant callus was bright to yellow-green, compact but friable. Fifty mg of callus was transferred to BSM medium containing 0, 10^{-8} , 2.5×10^{-8} , 5.0×10^{-8} , 7.5×10^{-8} and 10^{-4} M atrazine. Atrazine, technical grade, 99.44% (w/w) was obtained from Ciba-Geigy. The callus was divided into 10 equal portions 0.5 cm^2 .

Cultures were maintained in parafilm-sealed 60 X 20 mm disposable petri plates in a growth room under 16-h photoperiod at $26 \pm 2^\circ\text{C}$. All media were solidified with 0.3% Gelrite.

After 30 days, the callus was harvested and weighed. The results are listed in Table I. The greater the atrazine content of the media, the less the callus weight increased. Callus was greenest at zero or low atrazine concentrations, while at higher concentrations it became progressively browner and darker.

Callus from the above experiment was used to set up a similar second experiment. The largest callus clumps were chosen from each treatment. Calli on 7.5×10^{-8} and 1×10^{-4} M atrazine were transferred to the same media. Callus without atrazine was transferred to media with 0, 7.5×10^{-8} , 110×10^{-8} and 2.5×10^{-4} M atrazine. After 40 days at the above conditions, the callus was reweighed. The callus selected as faster growing from atrazine containing media grew more (increased in weight) than non-selected callus when both were on media containing the same concentration of atrazine.

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Table I. Atrazine resistance in light grown callus of Lotus corniculatus

Atrazine conc. (M)	Callus weight (mg)	Callus type		
		green	light colored	dark
0	971	6.6	2.0	1.4
1.0 X 10 ⁻⁵	651	6.0	3.2	1.2
2.5 X 10 ⁻⁵	402	5.0	2.0	1.0
5.0 X 10 ⁻⁵	243	2.0	7.0	1.0
7.5 X 10 ⁻⁵	192	1.8	5.6	2.6
1.0 X 10 ⁻⁴	146	1.2	6.2	2.4

Reference

MacLean, N. L. 1986. A study using in vitro selection to develop herbicide resistance in Lotus corniculatus. M. Sc. Thesis, McGill Univ., Montreal.

MacLean, N. L. and Grant, W. F. 1987. Evaluation of birdsfoot trefoil (Lotus corniculatus) regenerated plants following in vitro selection for herbicide tolerance. Can. J. Bot. accepted.