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SHORT COMMUNICATION

FACTORS INFLUENCING *IN VITRO* MORPHOGENESIS OF TRIPLOID TEA CULTIVAR

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Growth of *in vitro* cultured nodal explants of tea and their morphogenesis are influenced by several factors; physiological maturity of the explants and polyphenols exuded into the medium affects the establishment of triploid tea cultivar, UPASI- 3.

UPASI-3, "Assam" type tea clone having high yielding potential suffers due to soil moisture stress. Development of protocol for micropropagation is a prerequisite for the future research programme with particular reference to *in vitro* breeding.

Nodal explants collected from the field grown tea bushes were sterilised and cultured on MS basal medium. Effect of nutrient concentration and various growth hormones for micropropagation is reported in this communication.

Explants originated from various positions of an aperiodic shoot differ in their *in vitro* response. First two nodes from the apex affected the success rate due to higher polyphenol exudation where the per cent establishment ranged from 15 to 45 per cent. About 80 to 88 per cent of explants have survived when third and fourth nodes were incubated under aseptic conditions while significant fall in culture establishment (42%) was observed with fifth node. Bonga (1984) claimed that juvenile tissues respond better than mature tissues which substantiates the present findings. Nevertheless, Rajasekaran and Raman (1993) reported that seventh and eight nodes have also high morphogenic potential.

Half strength MS media was found optimum to get maximum shoots with UPASI-3 than full strength. Uniformity and vigour was found to decline when full strength was used. Established plants were transferred onto half strength basal medium fortified with benzylaminopurine (BAP) and kinetin (Kn) at five ppm each for shoot multiplication. Multiplication rate progressively increased with increasing level of cytokinins; BAP enhances rapid multiplication while Kn did not induce more shoots.

Gibberellic acid (GA_3) was used either singly or in combination with BAP for shoot elongation. Results indicated that GA_3 alone did not show any beneficial responses; GA_3 with BAP at five ppm responded well where multiple shoots elongated five to eight cm within 40 to 45 days (Table I). Mechanism of GA_3 is probably connected with cellular component particularly cell membranes and long time regulatory effects may occur through modification of RNA and protein synthesis (Wareing and Phillips, 1978).

Table I. Effect of GA_3 and BAP on shoot elongation

BAP (ppm) + GA_3 (ppm)	Number of shoots	Shoot length (cm)
3 + 3	1.7	2.3
3 + 5	2.7	3.0
5 + 3	4.0	3.5
5 + 5	5.7	7.0
C.D.P. = 0.05	1.0	1.1

Elongated tea shoots with desirable stem length were transferred into the rooting medium. Since higher level of indole butyric acid (IBA) tend to induce callus at the cut ends, low concentration of IBA was tested. IBA at three ppm was found optimum and about 60 per cent of shoots produced radially distributed adventious roots within a month (Table II). Half or full strength medium was used in earlier studies to induce *in vitro* rooting of tea shoots (Banerjee and Agarwal, 1990; Jain *et al.*, 1991; Rajasekaran and Raman, 1993). When the salt concentration of the medium was lowered from half strength to one third or one fourth, rooting became easier. This may be attributed to the free mobilisation of the nutrients which faciliates rapid metabolic activities and media containing high salt concentrations have hindered the root formation (George and Sherrington, 1984).

Table II. Effect of Auxin concentration and media strength on rooting

Media strength	Number of roots per explant		
	IBA concentration (ppm)		
	1	2	3
Half MS, solid	2.0	2.7	4.0
Quarter, MS, solid	4.0	4.3	5.0
Quarter, MS, liquid	6.4	7.0	9.7

Results obtained in the above studies clearly indicate that a) third and fourth position nodal explants exhibited higher establishement rate, b) BAP for multilpication, BAP and GA_3 for elongation and IBA for rooting found optimum to get desired results with UPASI-3 plants, c) reduction in salt concentration influences *in vitro* morphogenesis of triploid tea cultivar.

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