RESEARCH NOTE

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Morphogenetic response on leaf explants of *Cucumus melo* cv. BATHASA

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Impact of various growth regulators on tissue and isolated plant cells was studied by several workers and these substances were known to play an important role in cell metabolism, cell membrane synthesis (Cocking, 1978) besides growth and differentiation (Butenko, 1968; Stress, 1969), of these growth substances auxins have proved to be an essential supplement for establishing successful culture of plant tissues (Gautheret, 1959; Rao and Swamy, 1972). Auxins were found to exert their hormonal action through their effects on the nucleic acids and protein metabolism. It was also found that auxins exert their effects, directly or indirectly on 'S' phase of DNA synthesis (Peaud-Lenoel, 1977). Cytokinins were found to influence cell growth by promoting nucleic acid metabolism and synthesis of specific proteins required for cell division. It was further reported that cytokinins bind to a specific receptor site in the cell to bring about organogenesis (Yamada *et al*., 1972). Physical environment *viz.*, state of medium, light temperature humidity etc., besides source and size of explants are known to play an important role in the *in vitro* organogenesis.

Cucumis melo cv. BATHASA is an annual climbing and creeping herb with large, soft hairy leaves and spherical, ovoid or elliptic fruits of varying size and colour. The plant is extensively cultivated in the warmer regions of the world of its luscious fruits valued as dessert. It is cultivated throughout India, particularly in the hot and dry north western areas. Numerous varieties and races are known differing in the size and shape of fruits, thickness, color and markings on the rind, taste, flavor and color of the inner flesh, and cultural behavior. The color of the flesh varies from white to cream-yellow orange or green. The plant grows in hot and dry regions and requires of plentiful supply of water. It is often grown on sandy river beds hardly suited to any other crop. The fruits are ready for harvest in 3-4 months and are picked when fully ripe on the vine. They may be picked earlier if required for distant markets. Melons are eaten raw as dessert. The flesh constituting 45-80% of the fruit is soft, often mealy in consistency, with musk-like odor and delicious taste. Fruit contains protein 0.6%, carbohydrates 5.4%, Fat 0.2%, crude fiber 0.5%, ash 0.6%, calcium 0.016% and phosphorus 0.015%, Iron 3.9 mg. per kg; (pro). Vitamin A 2400 I.U; Vitamin B_1 57 µg, Vitamin B_2 75 µg, and Vitamin C, 25 mg per 100g. The seeds are edible and are used as substitute for almond and pistachio. The seeds are diuretic. The pulp also is diuretic and beneficial in chronic or acute eczema.

The leaf explants inoculated on MS medium containing BAP and 2, 4-D initiated callus. Addition of NAA and BAP to the MS medium resulted in a small bud formation from callus derived from leaf. MS medium supplemented with 10%, 15% and 20% of coconut milk in addition to cytokinin (BAP) triggered the induction of multiple shoots. Among the three concentration used, 15% of coconut milk along with 0.5 mg/l BAP has proved to be ideal for multiple shoot induction. MS medium fortified with 1.0 mg/l BAP and 2.0 mg/l L-glutamic acid favored the induction of multiple shoots which ranged from 8-10 from cotyledon segments.

The leaf explants were inoculated on MS basal medium fortified with various cytokinins *i.e.*, BAP and kinetin. Coconut water also had a role in triggering the formation of multiple shoots. Among all the explants used, segments were the best for multiple shoot induction followed by the leaf. Well developed multiple shoot obtained, were carefully isolated into individual segments along with a node each, and were placed on rooting medium. The shoots obtained were rooted, when placed on media containing 1 mg/l NAA + 0.5 mg/l BAP, resulting in the formation of plantlets with roots containing drained soil, and were covered with polythene bags for 15 days in a growth chamber, in order to harden the potted plants.

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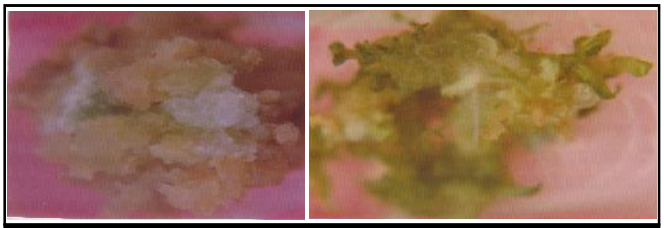

Plate1: Morphogenetic response on leaf explants on *Cucumis melo* cv. BATHASA

Table 1 : Morphogenetic response on leaf explants on cucumis melo cv. BATHASA

Treatment (h)	Leaf	
	% frequency of growth response	Morphogenetic response
Control	40	Callus + Roots + Shoots
6	3	Small shoot buds + Rooting
12	21	Greening brown callus
24	8	Browning and death of callus

Date scored at the end of 6 weeks of culture; NR = No Response

Well developed plantlets were transferred to earthen pots.

MS medium supplemented with BAP and IAA initiated formation of callus from leaf culture (Plate 1). Addition of kinetin along with L-glutamic acid and 15% coconut milk induced multiple shoots (6) from callus derived from leaf explants. Addition of 3.0 mg/l BAP or 5.0 mg/l kinetin to the MS medium induced shoot regeneration from the cultures and proximal end of auxiliary region of leaf and distal end of embryo explants. Within a period of two weeks in culture with an increase in the level of BAP (2.0 – 4.0 mg/l) the percentage of embryo explants producing shoots also increased (Table 1).

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