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In vitro cotyledon culture of *Cucumis melo* var. *utilissimus*- A medicinal important plant

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Recent developments in molecular biology and genetic transformation however, have made it possible to identify, isolate and transfer desirable genes in to sugarcane. In dry land agriculture, the altered plants showed increased production. Most of the recent research was made on tobacco, Alfalfa and *Arabidopsis thaliana*. Causing extensive cellular damage and inhibition of photosynthesis is a phenomenon called oxidative stress and is known as one of the major causes of plant damage as a result of environmental stresses. The explants cultured on regeneration media fortified with different vitamins, auxins and cytokinins (BAP, kinetin) in the concentrations of 0.5 and 3.0 mg/l. One of the regenerates showed some variation in the morphology of leaves which led to the estimation of nutritional of qualities of the fruits of regenerant in order to detect any different between the control, the normal regenerents and variant obtained. Cell maintained *in vitro* undergo a certain level of spontaneous genetic change, which may be induced or expressed by culture conditions. Variant cells may be induced to generate. Seedling was grown *in vitro* from sterilized seeds on the MS basal medium and explants like cotyledons. These cultures were kept for shoot regeneration at 26 ± 1 0C and under 16/8 photo period, all plants were normal except one plant regenerated from cotyledon explants was variant. This variant had exceptionally large leaves as well as had variation in protein profile and nutritional status. The regenerated shoots were transferred to the rooting medium and rooted plants were finally established in potted in the green house. 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 besides growth and differentiation, of these growth substances auxins have proved to be an essential supplement for establishing successful culture of plant tissues. Auxins were found to exert their hormonal action through their effects on the nucleic acids and protein metabolism. It also found that auxins axert their effects, directly or indirectly on 'S' phase of DNA synthesis. 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.

Dynamic cytoskeleton rearrangements in root-knot nematode feeding cells and future perspectives

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Among plant pathogens, sedentary endoparasitic root-knot nematodes (*Meloidogyne spp.)* are one of the most harmful pests in global agriculture. The use of nematicides is highly pollutant to the environment and consequently new strategies must be envisaged. Root-knot nematodes are competent to transform plant root cells into feeding sites that supply nutrients for the nematodes. Nematode feeding cells, also called giant cells, harbor a dense cytoplasm and show a rearranged actin and microtubular cytoskeleton. As nematodes induce fragmentation and long-term rearrangements of the plant cytoskeleton during infection, manipulation of cytoskeleton components necessary for parasitism could be used as targets to obtain resistant plants. Recently, we have shown that new microtubules in plants are nucleated by cytoplasmic or microtubule-bound γ-tubulin ring complexes. Stable γ-tubulin-GFP expressing *Arabidopsis* lines provide compelling evidence for the physical interaction between components of the γTuRC, γ-tubulin and γ-tubulin-complex protein 3 (GCP3) as part of free cytoplasmic and microtubules associated complexes. Our results confirmed that γTuRC is an essential element of the microtubule nucleation apparatus throughout giant cell development. The reduction of γ-tubulin and GCP4 levels compromises γTuRC functioning and affects microtubule nucleation in giant-feeding cells, delaying their development and affecting nematode reproduction. Upregulation of microtubule nucleation induced by γTuRC is essential for the nematode parasitism and this process can be targeted in order to protect plants against nematode infection. The knowledge on the cytoskeleton reshuffling in feeding sites may well trigger the awareness of biotechnology companies and crop breeders in developing new strategies for the control of pathogen infection.