Masochon Zimik et al., Curr Synthetic Sys Biol 2017, 5:2 (Suppl)
DOI: 10.4172/2332-0737-C1-012

In vitro regeneration and *Agrobacterium* mediated transformation of *Sesamum indicum L.*

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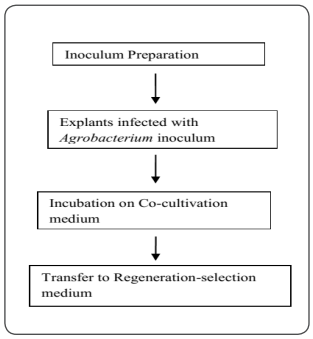

Sesamum indicum L. (Family *Pedaliceae*) is known for its high oil content (50%) and is a source of medicinally important lignans (Sesamin, Sesamolin, tocopherols) for cure of modern non- communicable diseases such as obesity, hypertension and cancer. A high level of PUFA in sesame oil plays an important role in preventing atherosclerosis and heart diseases. The average world seed yield per hectare of this biologically important Sesame, however, is very low due to problems of various biotic and abiotic stresses. Limited research efforts on the use of conventional and biotechnological methodologies have resulted in minimal success in developing stress-tolerant cultivars. At this juncture one of the biggest challenges of using genetic engineering for improvement of this crop is the recalcitrant nature of Sesame to *in vitro* regeneration. In view of this an attempt was made to develop a protocol for *in vitro* regeneration by screening ten different Indian varieties of Sesame. The cotyledons directly excised from the seeds were cultured on culture medium which is composed of Murashige and Skoog nutrients supplemented with 6.5mg/l BAP, 1mg/l IAA and 5mg/l $AgNO_3$. The regeneration efficiency was found to be genotype and sucrose concentration dependent. This optimized protocol is now used for *Agrobacterium* mediated transformation. *A. tumefaciens* strain GV3101 carrying the binary vector pCGMCP22 containing β-glucuronidase (GUS) gene (uidA) and bar selectable marker gene encoding the herbicide degrading enzyme phosphoinothricin aminotransferase (PAT) is used.

Recent Publications

1. Chowdhary S, Basu A and Kundu S (2014) A new high-frequency*Agrobacterium*-mediated transformation technique for *Sesamum indicum L.* using de-embryonated cotyledon as explants. *Protoplasma*; 251(5): 1175-1190.
2. Yadav M, Chaudhary D, Sainger M and Jaiwal P K (2010) *Agrobacterium* tumefaciens mediated genetic transformation of sesame (*Sesamum indicum L.*). *Plant Cell Tissue Organ Cult*; 103: 377-386.
3. Were B A, Gudu S, Onkware A O, Carlson A S and Welander M (2006) *In vitro* regeneration of sesame (*Sesamum indicum L.*) from seedling cotyledon and hypocotyl explants. *Plant Cell Tissue Organ Cult*; 85: 235-239.
4. Seo H Y, Kim Y J, Park T I, Kim H S, Yun S J, Park K H, Oh M K, Choi M Y, Paik C H, Lee Y S and Choi YE (2007) High-frequency plant regeneration via adventitious shoot formation from de-embryonated cotyledon explants of *Sesamum indicum L. In vitro Cell Dev Bio Plant*; 43: 209-214.
5. Taskin K, Ercan A and Turgut K (1999) *Agrobacterium* tumefaciens-mediated transformation of sesame (*Sesamum indicum L.*). *Tr J Bot*; 23: 291-295.

Biography

Masochon Zimik has been working in the Department of Biotechnology, Pondicherry University and has her expertise in plant tissue culture. She is currently working with *Sesamum indicum* which is considered to be a recalcitrant crop to *in vitro* regeneration.

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