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

Masochon Zimik and Neelakantan Arumugam
Pondicherry University, India

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 AgNO₃. 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 phosphinothricin aminotransferase (PAT) is used.

Recent Publications

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.

masbiotech13@gmail.com

Notes: