

SHORT COMMUNICATIONS

AGROBACTERIUM TUMEFACIENS-INDUCED TUMOUR FORMATION ON SOME TROPICAL DICOT AND MONOCOT PLANTS

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AGROBACTERIUM TUMEFACIENS-induced tumour formation on plants is due to genetic transformation brought about by transfer of a part of the Ti plasmid DNA into the host cell^{1,2}. The transferred (T)-DNA covalently integrates into the chromosomal DNA of the host cell^{3,4}. This natural transformation system has been developed as 'disarmed' binary⁵⁻⁸ or co-integrate vectors⁹⁻¹² for introducing genes into plant genome. Using such vectors, regeneration of phenotypically normal plants, expression and sexual transmission of bacterial and plant genes has been shown in tobacco, *Petunia* and sunflower^{1,2}. Currently, there is wide interest to extend this transformation system to other plant species. The host range of *A. tumefaciens* and related *A. rhizogenes* harbouring Ri plasmid has been summarized^{13,14}.

Table 1 *Agrobacterium tumefaciens* mediated transformation of important tropical crop plants and some monocots

Dicotyledonous plants

<i>Cicer arietinum</i> Linn.	- Chick pea
<i>Cajanus cajan</i> (L.) Millsp.	- Pigeon pea
<i>Vigna radiata</i> (L.) Wilczek.	- Mungbean
<i>Vigna mungo</i> (L.) Hepper	- Black gram
<i>Arachis hypogaea</i> Linn.	- Groundnut
<i>Glycine max</i> Merr.	- Soybean
<i>Ricinus communis</i> Linn.	- Castor
<i>Manihot esculenta</i> Crantz	- Tapioca
<i>Ipomoea batatas</i> Linn.	- Sweet potato
<i>Cucurbita moschata</i> Duchesne	- Pumpkin

Monocotyledonous plants

<i>Asparagus tetragonous</i> Bresler
<i>Asparagus sprengeri</i> Regel
<i>Cordyline terminalis</i> Kunth
<i>Cordyline rubra</i> Hugel

The host range is generally confined to dicotyledonous species, though transformation of monocot plants has been reported¹⁵⁻¹⁷. We have found that several tropical plant species (table 1) not tested earlier^{13,14} show tumour formation following *in planta* inoculation with oncogenic strain A 208 harbouring PTiT37. Photographic evidence of tumour formation is presented in figures 1-5. Plants were inoculated after injuring the stem and maintained at $24 \pm 1^\circ\text{C}$ during the 24 hr post-inoculation period. The species transformed include important grain legume crops of the tropical and sub-tropical region. Four monocot species, also produced visible tumours which were nopaline positive. The results show the feasibility of genetic transformation in the crop species listed using Ti plasmid based vectors. Efforts are underway to regenerate plants of grain legume species from tissues transformed by *Agrobacterium* strains harbouring 'disarmed' Ti plasmid having a selectable marker.



Figures 1-5. Tumour-induced by *in planta* inoculation with *Agrobacterium tumefaciens* strain A 208; 1. *Cicer arietinum* Linn.; 2. *Arachis hypogaea* L.; 3. *Cajanus cajan* (L.) Millsp.; 4. *Cordyline rubra* Hugel; 5. *Asparagus tetragonous* Bresler.

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