Response of androgenic and zygotic embryos of *Datura metel* (*L.*) to excision of their meristems

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The role of terminal meristems in the induction of secondary embryos in zygotic and androgenic embryos of *Datura metel* (Kalu attana) after excision of primary meristems was investigated. Two types of meristem excisions were made on embryos under aseptic conditions *in vitro*. In the first, the shoot apical meristem and cotyledons were removed (apical cut) and in the second, both apical and root meristems were removed (terminal cut). Explants were cultured on Nitsch medium and incubated at 25±2 °C temperature and provided with 16/8 h day/night photoperiod. In addition to meristem-cuts, the role of kinetin and light on secondary embryogenesis was also determined. The number of secondary embryos was determined six weeks after culture initiation.

Two distinct responses were observed. Androgenic embryos produced secondary somatic embryos in and around the cut surface. The zygotic embryos produced shoot buds and adventitious roots from the cut surface. Histological sections showed secondary embryo development, independent of maternal tissue while shoot buds developing on zygotic embryo explants had clear vascular connections with the maternal tissue. Terminal-cut embryos produced more secondary embryos than the apical-cut embryos. Presence of kinetin significantly increased the secondary embryos alone and in combination with light (450 µmol/m^2/s) with a photoperiod of 16/8 h day/night. Zygotic embryo explants exhibited remarkable ability to regenerate into plantlets. Plantlet formation was high when one meristem was left intact. Successful regeneration was achieved when mature, detached secondary embryos were transferred into hormone free solid MS medium.

Excision of meristems in androgenic embryos apparently stimulates hypocotyl cells to produce somatic embryos. This could be attributed to either absence of apical dominance or to cellular changes as a result of tissue damage. Zygotic embryos underwent organogenesis to develop plantlets even after excision of shoot apical meristem and severe tissue damage.

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