B-41: Effect of cytokinin on shoot induction of *Exacum macranthum* nodal segments

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The floriculture industry is a vibrant, income-generating sector. One of its important aspects is the introduction of new plants, to maintain a competitive edge in world markets. Identification of naturally available exotic plants in the wild and their subsequent adaptation to suit consumer preferences is one method of introducing new plants.

Sri Lanka is endowed with a rich floristic heritage which includes plants with a high horticultural value. *Exacum macranthum* was one such flowering plant identified as having the potential to be introduced as a potted ornamental. Tissue culture techniques were perfected for the mass propagation of these plants.

Plants grown in the wild were collected and grown under greenhouse conditions. Nodal segments (1-1.5 cm segments with 2 leaves) were obtained as explants from these plants. Explants were surface sterilized by soaking in a 10% clorox (NaOCl) (solution for 20 min and subsequently rinsing in distilled water. Explants were cultured on a basal Murashige and Skoog (MS) medium with 3% sucrose, supplemented with 3 levels of the Cytokinin, benzyl amino purine (BAP). All media used solidified with agar and a pH of 5.8 was maintained for all cytokinin treatments. Three different concentrations of BAP 0.1, 0.2 and 0.25 mg/1 were tested, cultures belonging to each concentration were replicated thrice. Cultures were maintained at a temperature of 25°C and a 16 h photoperiod of 53 μmol $m^{-2}s^{-1}$. Number of shoots produced were counted for each cytokinin treatment in order to find the best concentration. Visual observations were also considered.

For purposes of rooting the cytokinin was removed from the medium and the auxin naphthalene acetic acid (NAA) was added at a concentration of 0.1 mg/1 to the basal MS medium. Gibberellic acid (GA_3) at a concentration of 1 mg/1 was also added to the rooting medium. The rooting medium solidified with agar was also maintained at a pH level of 5.8.

Shoot formation from nodal segments, was seen in all 3 levels of BAP tested. Nodal segments grown in concentrations of 0.2 & 0.25 mg/1 BAP produced a higher number of shoots and showed callus formation as well. However shoots produced were crowded together. Even when subcultured individually, elongation of shoots were hindered at these concentrations. This resulted in stunted shoots with short internodes. Nodal segments exposed to a concentration of 0.1 mg/1 BAP produced lesser number of shoots and no callus formation was seen. These shoots also showed relatively lower levels of crowding together. When subcultured individually, shoots elongated. However some of the shoots showed short internodes at this concentration as well. Results indicate that the cytokinin BAP plays an important role in shoot initiation and subsequent elongation of shoots. Nodal segments exposed to lower levels of BAP showed better overall performance.

The total number of leaves produced varied between seasons, which could be attributed to the micro-climatic differences during Maha 1992/93 and during Yala 1992.

Cumulative pre- and post-flowering spikelet abortion was also greater under broadcast sowing (69 - 79%) compared to transplanting (54 - 69%). This could be attributed to source limitation to sustain the differentiated spikelets under broadcast sowing. Under transplanting higher number of leaves increased the source availability to sustain differentiated spikelets.

Experiment 3 where 6 rice varieties: At 353, At 354, Bg 350, At 402, Bg 400-1 and Bg 380 were tested, transplanting shock increased the number of leaves from 9, 9, 9, 12, 12 and 10 to 13, 14, 14, 15, 15 and 16 respectively. This increased the photosynthetic assimilate production, an absolute advantage for a source limiting crop. Physiological panicle initiation was however delayed by about 5 days in all the varieties due to transplanting.

Results indicated that the transplanting shock of rice increase the differentiation of leaf primordia number irrespective of variety and could vary with the season of cultivation and the variety.