



Figure 5. Influence of IAA on root formation and growth of *in vitro*-produced shoots of *C. aurantifolia*. *a*, Percentage of shoots that produced roots; *b*, Number of roots per shoot; *c*, Length of roots; and *d*, Shoot growth.

directly related to the concentration of IAA (Figure 5 *c*). The longest roots, 4.8 cm, were found in media containing 2 mg l⁻¹ IAA. Among the parameters measured (Figure 5), shoot elongation on rooting medium was least influenced by the concentration of IAA. Compared to the IAA-free control, shoot elongation was enhanced by the addition of IAA to the rooting medium regardless of its concentration (Figure 5 *d*). To encourage root development, it may be advantageous to transfer shoots from root induction on 1 mg l⁻¹ IAA, which gave the highest rooting percentage, to 0.5 mg l⁻¹ IAA, which resulted in the highest number of roots. Over ninety per cent of plantlets (76 out of 83

plantlets) survived acclimatization and grew normally in soil with development of new leaves. It would require 4 to 5 years before their field growth habit and fruit characteristics can be evaluated.

This report provides a simple protocol for the micro-propagation of lime. Shoots can be easily derived from node cultures on BAP-containing medium and subsequently rooted on IAA-containing medium. The efficiency of the system could be improved to give rise to more shoot proliferation. An intermediate shoot multiplication step, after shoot induction and prior to rooting, may increase the culture yield. Likewise, investigation involving other phytohormones may be fruitful in improving shoot proliferation. This approach offers a means for producing identical propagules from mature trees selected for desired horticultural characteristics.

- Gmitter, F. G., Grosser, J. W. and Moore, G. A., *Biotechnology for Perennial Fruit Crops* (eds Hammerschlag, F. A. and Litz, R. E.), CAB International, Wallingford, 1992, pp. 335–369.
- Moore, G. A., Jacono, C. C., Neidigh, J. L., Lawrence, S. D. and Cline, K., *Plant Protoplasts and Genetic Engineering IV, Biotechnology in Agriculture and Forestry* (ed. Bajaj, Y. P. S.), Springer, Berlin, 1993, vol. 23, pp. 194–208.
- Spiegel-Roy, P. and Vardi, A., *Handbook of Plant Cell Culture, Crop Species* (eds Ammirato, P. V. *et al.*), Macmillan Pub. Co, New York, 1984, vol. 3, pp. 354–372.
- Raj Bhansali, R. and Arya, H. C., *Curr. Sci.*, 1978, **47**, 775–776.
- Duran-Vila, N., Cambra, M., Medina, V., Ortega, C. and Navarro, L., *Phytopathology*, 1989, **79**, 820–826.
- Perez-Molphe-Balch, E. and Ochoa-Alejo, N., *HortScience*, 1997, **32**, 931–934.
- Gutierrez-E, M. A., Luth, D. and Moore, G. A., *Plant Cell Rep.*, 1997, **16**, 745–753.
- Pena, L., Cervera, M., Juarez, J., Navarro, A., Pina, J. A. and Navarro, L., *Plant Cell Rep.*, 1997, **16**, 731–737.
- Perez-Molphe-Balch, E. and Ochoa-Alejo, N., *Plant Cell Rep.*, 1998, **17**, 591–596.
- Singh, S., Ray, B. K., Bhattacharyya, S. and Deka, P. C., *HortScience*, 1994, **29**, 214–216.
- Murashige, T. and Skoog, F., *Physiol. Plant.*, 1962, **15**, 473–497.
- Pereira, A. M. S., Moro, J. R., Cerdeira, R. M. M. and Franca, S. C., *Plant Cell Tiss. Org. Cult.*, 1995, **42**, 295–297.
- Dewan, A., Nanda, K. and Gupta, S. C., *Plant Cell Rep.*, 1992, **12**, 18–21.

ACKNOWLEDGEMENTS. We thank Mr Adnan M. Al-Ramadhan and Mr Khalid M. Al-Ali for lab assistance.

Received 15 May 2001; revised accepted 8 August 2001

Erratum

Taxonomic entomology research and education in India

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(*Curr. Sci.*, 2001, **81**, 445–447)

The sequence of orders of insects for Figure 1 is the same as that given for Figure 2.