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Cultivar specificity with respect to *in vitro* micropropagation of *Musa* spp. (banana and plantain)

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SUMMARY

The study compares *in vitro* micropropagation responses and cultivar specificity using 12 cultivars of five genomic composition. Variation was revealed in *in-vitro* multiplication between cultivars of different genomic compositions and also within them. The rate of multiplication was highly variable: between about one and ten per week at the fourth subculture. It appeared that genome 'B' adversely affected multiplication; the more 'B' genomes in the group, the lower the rate of multiplication. AAA group members showed the highest rate of multiplication with the lowest range. The rate of multiplication also appears to be related to the degree of browning of the shoot tip tissues. It is suggested that multiplication is cultivar-specific and influenced by many factors such as the culture environment. Such studies are important for *in vitro* breeding programmes in *Musa* spp.

In vitro micropropagation through meristem culture has been reported in many plant species, both monocotyledons and dicotyledons. A high rate of multiplication is observed in some and low rates in others. High variation in multiplication rate is also reported among species of the same genus, even when cultured under the same conditions (George and Sherrington, 1988).

The genus *Musa* contains many members and has a complicated taxonomy. Edible cultivars are interspecific hybrids of the two wild species *Musa balbisiana* (BB) and *Musa acuminata* (AA) (Simmonds and Shepherd, 1955; Rowe, 1984). The interspecific hybrids (cultivars) have been grouped according to the contribution to the ploidy of the two wild species, with *M. balbisiana* providing the 'B' genome and *M. acuminata* the 'A' genome. The resulting hybrids are designated AA, AB, BB, AAA, ABB, ABBB and AAAA (Stover and Simmonds, 1987). These include 300-500 cultivars spread throughout the world (De Langhe, 1987). Almost all edible bananas are triploid and seed sterile. Traditionally, *Musa* is propagated by suckers produced at the base of each mother plant.

In-vitro multiplication by meristem culture is well established in *Musa* spp. (Ma and Shii, 1972; Hwang *et al.*, 1984; Banerjee *et al.*, 1985, 1986; Sannasgala, 1989). Shoot-tip culture (meristem culture) has become a routine procedure for rapid *in-vitro* multiplication of bananas. However, reports comparing *in-vitro* micropropagation of cultivars are lacking, despite the existence of 300-500 cultivars of *Musa*.

The present study compared the micropropagation of 12 *Musa* cultivars, in a search for cultivar specificity in shoot multiplication. Such a study could then be compared with (i) molecular studies to identify any protein(s) characteristic of cultivar and multiplication and (ii) any cultivar effect/specificity on somatic embryogenesis in *Musa*. Such information could also assist in understanding the evolution of existing cultivars.

MATERIALS AND METHODS

Explants

Shoot tips (each comprising a meristem and a few leaf primordia) were the explant. Healthy sword suckers were used to excise

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