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Research notes

INTERCLONAL HYBRIDISATION IN BANANA

In the early banana breeding programmes started in Jamaica and Trinidad in 1920s emphasis was on the use of the two wild species viz., *Musa acuminata* Colla. and *Musa balbisiana* Colla. as male parents (Simmonds, 1966). This has influenced the commercial qualities of the progenies adversely (Menendez and Shepherd, 1975). The use of edible diploids as male parents in banana breeding programmes is comparatively of recent origin (Azhakiamanavalan and Rao, 1980). Further, cultivars belonging to different ploidy levels and genomic groups appear to be promising materials for the hybridisation in banana.

In the state of Kerala, practically no work has been carried out so far in banana breeding. Therefore, information was collected on the various aspects of male and female fertility and pollen production of banana clones belonging to different genomic groups based on which further breeding experiments could be designed. Compatibility was reported in eight crosses involving Harichal, Lacatan, Palayankodan, Mannan, Nendravannan, Nendran and Agniswar as female parents and Pisang Lilin and Sikuzani as male parents (Karmacharya, 1984). One seedling was obtained from each of the crosses Harichal x Pisang Lilin, Mannan x Pisang Lilin, Nendravannan x Pisang Lilin, and four seedlings from Agniswar x Pisang Lilin. Three seedlings from the cross Agniswar x Pisang Lilin were maintained at the College of Horticulture and others at the Banana Research Station, Kannara. All the seedlings produced seedless fruits.

Table 1 shows the biometrical traits of the best hybrid from the cross Agniswar x Pisang Lilin as compared to its parents.

The hybrid seedling was found to be shorter than the female parent and better than the to parents in respect of number of leaves at harvest, leaf area, bunch weight, hand and finger characters, total and reducing sugars. The suckers from the seedling are planted in a replicated trial with parents for detailed studies. They are expected to give a better performance, with regard to duration, since the suckers will take lesser time from planting to flowering than seedlings.

The hybrid was found to be triploid (2n=33) of AAB genome on cytological studies and taxonomic scoring. Pisang Lilin is diploid (2n — 22) of AA genome (Dodds and Simmonds, 1948) and Agniswar is diploid (2n = 22) with AB genome (Valsalakumari, 1984). Since the hybrids are triploids it is clear that the maternal parent does not undergo normal meiosis, instead, produces unreduced

Table 1

Plant, bunch and finger characters of the hybrid and parents

Sl. No.	Character	Hybrid	Agniswar	Pisang Lilin
1	Plant height (cm)	270.00	284.00	64.30
2	Pseudostem girth (cm)	60.00	64.33	9.33
3	Number of functional leaves at flowering	10.00	9.33	5.66
4	Leaf area (m^2)	9.52	8.06	2.63
5	Length of petiole (cm)	40.00	42.00	10.32
6	Bunch weight (kg)	6.50	5.28	2.30
7	Number of hands	7.00	5.66	400
8	Number of fingers	60.00	65.00	5000
9	Finger length (cm)	19.00	12.00	15.25
10	Finger girth (cm)	15.00	7.50	6.16
11	Finger weight (g)	70.00	45.00	38.50
12	Finger volume (cm^3)	62.00	51.80	27.03
13	TSS (%)	18.63	21.33	19.03
14	Acidity (%)	0.60	1.34	0.72
15	Total sugars (%)	17.55	13.28	8.36
16	Reducing sugars (%)	17.08	11.70	7.38
17	Sugar/acid ratio	29.25	30.28	34.32

diploid gamete. The paternal parent undergoes normal meiosis and produces haploid gamete. The progeny from Agniswar x Pisang Lilin is thus a triploid.

The results of the first attempt on banana hybridization in Kerala should be viewed from a different angle rather than considering its commercial importance. The study justified the inclusion of the banana cuitivars in the breeding programme

instead of their wild parents. Also it reveals the possibility of producing seedless banana hybrids in the first generation itself using cultivars as parents. Another observation in the present programme, reveals a new line of thinking in the evolution of banana cultivars. The fruits of the hybrid are similar to the fruits of Nendravannan (AAB) in morphological characters and taste. Cultivated bananas, so far, are reported to be originated from *Musa acuminata* or as hybrids of *Musa acuminata* and *Musa balbisiana* (Cheesman, 1947; Simmonds and Shepherd, 1955) and the source of variation is mutation (Simmonds, 1966). But the South Indian bananas should be viewed from a different angle in which the extent of variability is very high (Raman *at al.* 1976). Even cultivars like Sanna Chenkadali belonging to the AA genomic group show an introgression of the characters of *Musa balbisiana* (Ramon *et al.* 1976; Valsalakumari, 1984). There is every possibility of the evolution of naw cultivars of banana as products of hybridization between the present cultivars with pollen and female fertility.

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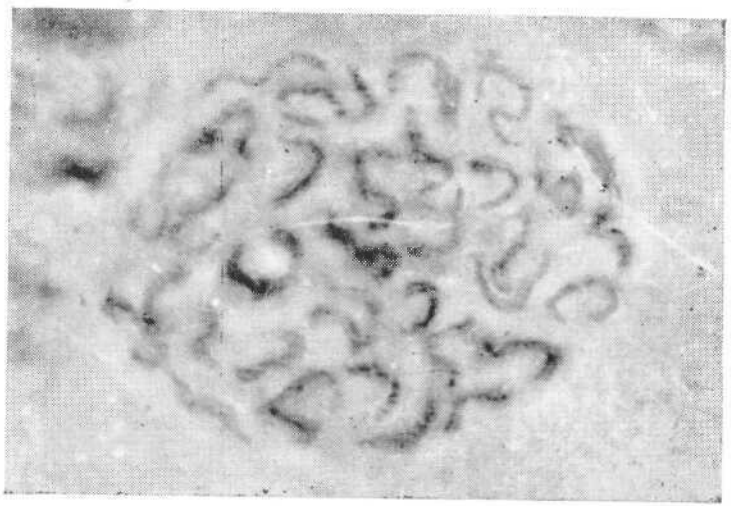

Fig 1 Somatic chromosomes of Agniswar x Pisang Lilin 2n = 33 **(x 500)**