

## STUDIES ON POLLEN STORAGE IN BANANA

J. K. L. Karmacharya, M. Aravindakshan and P. K. Valsalakumari

*College of Horticulture, Vellanikkara 680654, Trichur, Kerala*

The possibilities of evolving new varieties of banana through interclonal hybridization are emphasised in recent years (Anon, 1982). Studies on the pollen fertility and compatibility of banana clones conducted at the College of Horticulture, Vellanikkara, Trichur showed that clones belonging to different genomic groups could be used as male and female parents (Karmacharya, 1984; Valsalakumari, 1984). Storage of pollen becomes necessary especially when the male and female parents come to the productive phases in different times. In a crop like banana, although the synchronisation of the reproductive phases of the parents appears to be possible by adjusting the planting time, studies on pollen storage are of great relevance. Considering the importance of this aspect, studies on the pollen storage of banana cultivars were conducted in the Department of Pomology and Floriculture, College of Horticulture, Vellanikkara, Trichur.

### Materials and Methods

The clones Elavazhai, Wather, Bodies Altafort and Hybrid Sawai were used for pollen storage studies. The bracts along with the flowers were collected just before anther dehiscence and kept under the following conditions of storage.

- 1 Open storage at room temperature (control) (20°C to 33.2°C temperature and RH 92 per cent)
- 2 In desiccator over calcium chloride at room temperature (30°C and RH 6 per cent)
- 3 In refrigerator at 4°C and RH 40 per cent.
- 4 In desiccator over calcium chloride kept in refrigerator at 7°C temperature and RH 6 per cent.

Pollen grains were collected from each treatment and were tested for their viability by acetocarmine staining technique every day.

### Results and Discussion

The data on the storage life of pollen grains of the four banana clones under the four conditions of storage are presented in Table 1. Among the four types of storage it was found that pollen viability could be maintained for the maximum period, 24 to 38 days depending upon the clones, when the bracts with flowers intact were stored in the refrigerator. This method of storage was on par with the methods of storing bracts in desiccator at room temperature and in desiccator kept in refrigerator. Similar findings of the successful pollen storage in low temperature and in desiccator over calcium chloride for longer periods were reported by Sedov (1955), Singh *et al.*, (1961) and Sinha (1973). Though the storage life of pollen

Table 1

Number of days taken for losing viability for different clones under different storage conditions

| Clones          | Storage condition          |                        |  |                                      | Total | Mean  |  |
|-----------------|----------------------------|------------------------|--|--------------------------------------|-------|-------|--|
|                 | Bracts at room temperature | Bracts in refrigerator | Bracts in desiccator at room temperature | Bracts in desiccator in refrigerator |       |       |  |
| Elavazhai       | 11                         | 26                     | 20                                       | 14                                   | 71    | 17.75 |  |
| Bodies Altafort | 20                         | 38                     | 32                                       | 28                                   | 118   | 29.50 |  |
| Wather          | 13                         | 30                     | 26                                       | 22                                   | 91    | 22.75 |  |
| Hybrid Sawai    | 12                         | 24                     | 19                                       | 16                                   | 71    | 17.75 |  |
| Total           | 56                         | 118                    | 80                                       | 97                                   |       |       |  |
| Mean            | 14                         | 29.50                  | 20                                       | 24.25                                |       |       |  |
| Chi-square      | 23.58*                     |                        |  |                                      |       |       |  |

Table 2

Relative rate of reduction in viability of various clones under different storage conditions (regression coefficients)

| Clones          | Storage condition          |  |                                      |                        | Total | Mean  |
|-----------------|----------------------------|--|--------------------------------------|------------------------|-------|-------|
|                 | Bracts at room temperature | Bracts in desiccator at room temperature | Bracts in desiccator in refrigerator | Bracts in refrigerator |       |       |
| Elavazhai       | 29.85                      | 28.09                                    | 23.16                                | 12.28                  | 93.38 | 23.32 |
| Bodies Altafort | 21.60                      | 12.80                                    | 11.08                                | 10.25                  | 55.73 | 13.93 |
| Wather          | 27.52                      | 18.01                                    | 12.70                                | 10.48                  | 68.71 | 17.18 |
| Hybrid Sawai    | 32.43                      | 20.45                                    | 21.11                                | 12.16                  | 86.15 | 21.54 |

grains was the lowest in control (11 to 20 days), it is interesting to note that even under room temperature the pollen remained viable for a few weeks when the flowers were intact with bracts. This, perhaps, indicates that the bracts provide useful protection to the enclosed flowers.

The varietal response to storage condition is also evident from the data presented in Table 1. Among the four clones, the pollen grains of Bodies Altafort exhibited the maximum storage life under all the methods of storage. In the case of this clone, under the storage of bracts in refrigerator, the pollen remained viable for 38 days while in Hybrid Sawai in which the storage life was the least, under the same condition of storage, the viability was lost in 24 days.

The relative rates of reduction in viability of the four clones under the different treatments are presented in Table 2. The rate of reduction of viability was the minimum in Bodies Altafort while it was the maximum in Hybrid Sawai. In a crop like banana, where genomic constitution and ploidy levels vary greatly, these differences could be expected in contrast to horticultural varieties of other crops.

### Summary

Studies on the pollen storage of four banana clones showed that the pollen viability could be maintained for the maximum period of 24 to 38 days, depending upon the clones, when the bracts with flowers intact were stored in the refrigerator (4°C). The clone Bodies Altafort exhibited the maximum storage life and the least rate of reduction of viability while Hybrid Sawai had the minimum storage life and maximum rate of reduction of viability.

### സംഗ്രഹം

fflajggocT/l<9s>rocQ)Ts>£j ഹോർട്ടികൾച്ചർകോളേജിലെപോമോളജി വിഭാഗത്തിൽ വാഴയുടെ പരാഗം സൂക്ഷിക്കുന്നത് സംബന്ധിച്ചു നാലിനം വാഴകൾ ഉപയോഗിച്ചു നടത്തിയ പരീക്ഷണങ്ങൾ പൂക്കൾ പോളിയോട്ടുകൂടി റഫ്രിജറേറ്ററിൽ സൂക്ഷിച്ചാൽ 24 മുതൽ 38 ദിവസങ്ങൾ വരെ സൂക്ഷിക്കാമെന്ന് തെളിയിച്ചു. ബോഡീൽസ് അട്വാഫോർട്ട് എന്ന ഇനം വാഴയുടെ പരാഗം ഏറ്റവും കൂടുതൽ കാലം സൂക്ഷിക്കുന്നതിന് സാദ്ധ്യതയുണ്ടെന്ന് തെളിഞ്ഞപ്പോൾ ഹൈബ്രിഡ് സവായ് എന്നയിനം വാഴയുടെ പരാഗത്തിനാണ് ഏറ്റവും കുറവ് സൂക്ഷിപ്പുകാലം ഉള്ളതായി കണ്ടത്.

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