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Assessment of cooking banana for red-laterite region of West Bengal

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ABSTRACT

Germplasm of cooking bananas (two cultivars and seven accession, namely Kanchkele 1,2,3,4,5 Behulla, Pantharaj, Kanchkele – 6, 7) were assessed at the Regional Research Sub-station, Sekhampur, Birbhum of Bidhan Chandra Krishi Viswavidyalaya during the years 2003-2005 by using twelve physical parameters with different multivariate techniques such as single linkage and average linkage within group hierarchical clustering of squared Euclidean distance matrix and principal component analysis (PCA). Cooking bananas under study formed five-(5) clusters group irrespective of the clustering techniques. Kanchkele – 7, Kanchkele – 5, Kanchkola –3 separated from the rest of the cooking bananas and formed single member cluster. Pantharaj, Kanchkele –6 & Kanchkele –2, formed the cluster –Kanchkele-1 Kanchkele, I – 4 & Behulla were grouped together to form cluster – 2. In principal component analysis (PCA) Kanchkele- 3 and Kanchkele – 7, was dominated by characters like fruit number and hand number contribuling 25.66% of total variation. Pantharaj & Kanchkele – 3 were dominated by hand number, bunch weight, fruit number and fruit diameter explaining 16.93% of total variance. It may be concluded that cooking bananas like Pantharaj and Kanchkela–3 may be suggested to grow for better yield in red and laterite region of West Bengal.

Key Words : Cooking banana, assessment, cluster analysis, PCA.

Cooking banana is an important fruit used as vegetable, grown extensively from coastal saline region to foothill of West Bengal. It is the crop consumed widely, easily assessed and affordable, providing food and nutritional security. Cooking banana is available round the year which can be cultivated by the small and marginal formers and even in the homestead land. This covering banana belongs to ABB group having lot of variation in plant vigour, size & shape. The present, investigation was under taken to assess cooking banana clones of commercial interest for red laterite region of West Bengal.

MATERIALS AND METHODS

Nine cooking banana germplasms had been collected from different parts of West Bengal. Five suckers of each germplasm were planted in single rows in a compact plot adopting a distance of 2.5 m between rows and within the row. The assessment was carried out at the Regional Research sub-station, Sekhampur, Birbhum of Bidhan Chandra Krishi Viswavidyalaya during 2003-2005. Observation were recorded on planting to shooting interval, crop duration, Pseudostem height, Pseudostom girth, fruit weight, Fruit length, Number of hand/bunch, Number of leaves at flowering, Number of leaves at harvest. Multivariate analysis of assessment of cultivation was made following nearest neighbourhood method of hierarchical cluster analysis of Squared Euclidean distant matrix technique (Dillon & Goldstein, 1984).

RESULTS AND DISCUSSION

Cluster analysis

Cluster analysis helped in grouping the germplasms based on the given characters. Cluster analysis further indicated how similar the germplasm to each other's, a procedure found useful in distinguishing germplasms. Dendrogram using single linkage and average linkage within group hierarchical cluster analysis based upon squared Euclidean distance matrix between germplasms using evaluation variables under study is presented in Fig-1 & 2. The possible cluster for each distant matrix using permitted level of distance based upon dissimilarity of existing characters. From dendrogram it was found that both average linkage within group and single linkage clustering method, five (5) cluster groups were formed at allowed distance co-efficient of 16.02 & 14.02. Cluster –1 consisted of the germplasms like Pantharaj, Kanchkele – 6 & Kanachkele – 2 as they were similar to each other by evaluation variables. The germplasms Kanchkele – 1,4 & Behulla formed second cluster group as they are nearest to each other. Cluster – 3 to 5 was Kanchkele –7, Kanchkele –5, and Kanchkele –3, as they were identical in evaluation characters & formed separate single member cluster. The present findings are in agreement with the findings of Lenka *et al.* (2004).

Principal Component Analysis

Four factors were extracted explaining 86% of total considering the factors having eigen value of more than one (Table-1). First factors was positively and heavily loaded by pseudostem height, pseudo stem girth, number of leaf at flowering and number of leaf at harvest in contrast to negatively loaded characters like planting to shooting, plant crop cycle, bunch weight, number of hand and number of fruits. Hence, germplasm Pantharaj and Kanchkela-6 were

mostly characterized heavily by those positively loaded characters, whereas kanchkela-3 loaded by negatively loaded characters. Factors –2 positively loaded by number of fruit and hand number and included the germplasms like kanchkela-3, Kanchkela-7 and Pantharaj. Third factors were dominated by bunch weight, number of hand, number of fruit and fruit diameters represented the germplasms like pantharaj and Kanchkela-3. Factor-4 showed that Behulla, Kanchkela-2 and 3 were mostly enriched by fruit length and fruit weight (Table-1).

It may be concluded that germplasms like Pantharaj and Kanchkela-3 may be suggested to grow for better yield in red and laterite region of West Bengal.

REFERCNCES

Dillon, W. R. and Gold Stein (1984). Multivariate analysis- Methods and Applications. John wiley and Sons, New York. pp. 25 - 50.

Lenka, P. C., Biswal, M. K. and Mishra, S. N. (2004). Genetic variability and correlation studies in culinary banana. *Pro. Nat. Sem. On Banana Industry: Present scenario and future strategies*, held at Bidhan Chandra Krishi Viswavidyalaya, during June 11 - 13, 2004. pp. 3 - 4.

Table 1 : Component loading and eigen value accounted for variance based on correlation matrix input for cooking banana.

Characters	Factor-1	Factor-2	Factor-3	Factor-4
Planting-shooting	-0.841	-0.404	-0.149	-0.140
Crop duration	-0.421	**-0.504**	0.069	-0.052
Pseudostem height	**0.501**	**-0.825**	0.133	-0.006
Pseudostem girth	**0.594**	-0.211	0.361	-0.343
Bunch weight	**-0.526**	-0.102	**0.724**	0.261
Fruit number	-0.448	**0.708**	**0.518**	0.120
Fruit length	-0.065	-0.399	0.087	**0.885**
Fruit diameter	0.081	-0.240	0.767	-0.009
Fruit weight	0.224	**-0.523**	**0.751**	**0.787**
Leaf number at flowering	**0.753**	0.276	-0.315	0.356
Leaf number at harvest	**0.909**	0.078	0.340	-0.034
Eigen value	**5.112**	**4.106**	**2.709**	**1.962**
Variance explained (%)	**31.951**	**25.663**	**16.930**	**12.263**
Cumulative variance (%)	**31.951**	**57.613**	**74.543**	**86.806**

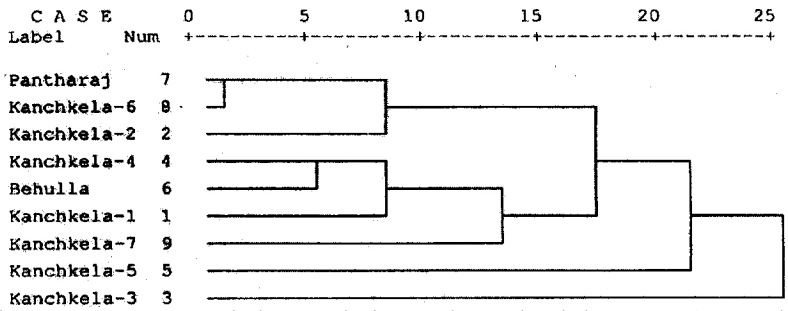

Fig.1: Dendrogram using average linkage within group hierarchical clustering of squared Euclidean distance matrix for evaluating cooking banana germplasms

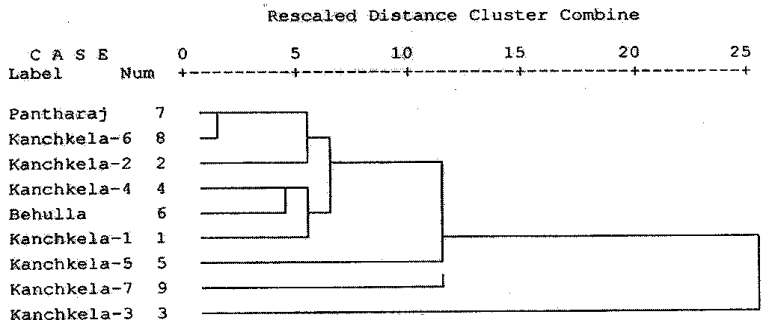

Fig. 2 : Dendrogram using single linkage hierarchical clustering of squared Euclidean distance matrix for evaluating cooking banana germplasms.