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INTRA GROUP CORRELATIONS IN THREE GENOMIC GROUPS OF BANANAS

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The correlation studies in banana are mainly aimed at predicting growth and yield performance and to suggest improvement in the agronomic practices for attaining higher yields. Information on these aspects is mostly based on data from the Cavendish group of bananas grown outside India(Summerville, 1944; Simmonds, 1953; and Alexandrowicz, 1955). The present study was undertaken at the Banana and Pineapple Research Station, Kannara, Kerala, to reveal the nature of association between bunch weight and its components in the three genomic groups of bananas namely, AAA, AAB and ABB involving 31, 61, and 35, genotypes respectively.

Materials and Methods

The selected genotypes were grown in lines of five plants each at 2 x 2.5 m spacing during 1976-77 under irrigated condition. The attributes studied were plant height, pseudostem girth at one meter above ground level, number of leaves at shooting, area of the third leaf at sixth month of planting, number of hands per bunch, number of fingers per bunch and bunch weight and expressed as means for five plants. Correlation coefficients ('r') were computed separately for each associations within the three genomic groups and the significance of differences among the three values for the three genomic groups for the character associations were tested according to the method suggested by Hayes *et al.* (1955). When the three values did not differ, the combined value of 'r' was considered.

Results and Discussions

The mean values and range of the seven characters under study for the three genomic groups are given in Table I. The estimates of correlations between bunch weight and six agronomic traits within three genomic groups are given in Table 2. Wherever the 'r' values for three groups did not differ as revealed by the x^3 test, only a combined value has been given. Of the twentyone character pair comparisons, eight had different associations in the three genomic groups and for remaining character pairs only one 'r' value was good enough to indicate the nature of associations irrespective of genomic difference.

Height

Height of the plant was significantly correlated with girth, leaf area, number of fingers and number of hands in all the three genomic groups, whereas

its correlation with the number of leaves at bunching and bunch weight was significant only in the case of AAB genome. Most of the Indian table varieites of bananas come under AAB genome. Among these, most of the commercial varieties which produce larger bunches are always taller than the low yielding varieties and the positive correlation of bunch weight and number of leaves at bunching in the AAB genome is explicable on that basis. Eventhough the selected varieties included dwarf and medium tall ones, their number was too small (9) to influence the results.

Girth

Girth is seen positively and significantly correlated with height, leaf area, number of leaves at bunching and number of fingers in all the three genomic groups, whereas it is significantly correlated with number of hands in AAB group and bunch weight in AAA and AAB groups only. These results show that girth is a clear indication of the vigour of the plant which reflects the yield potential of the plant at least in the two table variety genomes AAA and AAB.

Number of hands

This character is found to be highly correlated with the number of fingers in all the three genomic groups. But it has significant correlation with bunch welght in the genomes AAB and ABB. In AAA group, higher number of hands is less Influenced by environment and hence their bunch weight is little influenced by this character.

Leaf area

The area of the third leaf at the sixth month of planting is found to be significantly and positively correlated with all other characters except bunch weight. The importance of third leaf at sixth month of planting is that it is produced at the time of flower initiation (Summerville, 1944). So, the area of the lamina is taken as an indication of the size of the bunch since the number of fingers and hands in a bunch are determined at the time of flower initiation. But the present study clearly shows the area of the third leaf at the sixth month of planting cannot be taken as an indication of the bunch weight, though this is positively correlated with the number of hands and fingers.

Number of leaves at bunching

This character is seen significantly correlatad only with girth and leaf area when all the three groups are considered together. But, in the case of AAB group this is significantly correlated with height also. This result is partially in agreement with the result reported from French Guinea (Anonymous, 1957).

Number of fingers

This character is seen positively and significantly correlated with all other characters except the number of leaves at bunching. This is in agreement

Table 1

Mean and range of characters in three genomic groups bananas

Characters	AAA		AAB		ABB	
	Mean	Range	Mean	Range	Mean	Range
Height (m)	2.14	1.40 — 3.10	2.13	1.40 — 3.70	2.94	1.90 — 4.00
Number of hands	7.15	5.00 —10.00	6.01	1.50 —11.60	2.94	1.90 — 4.00
Girth (m)	0.57	0.40 — 0.73	0.56	0.44 — 0.79	0.65	0.53 — 0.84
Third leaf area (m^2)	0.51	0.30 — 0.73	0.42	0.23 — 0.83	0.48	0.12 — 0.95
Number of leaves	14.93	9.00 —17.60	14.72	10.00 —20.00	16.01	8.60 —19.60
Number of fingers	91.32	48.60 –143.00	85.11	21.40 –187.20	107.02	32.00 –225.60
Bunch weight (kg)	12.69	4.10 —14.00	8.19	2.80 —14.70	10.81	6.00 —15.80

Table 2

Correlation coefficients (r) of bunch weight and some agronomic characters in the three genomic groups of bananas

Characters	No. of hands	Girth	Third leaf area	No. of leaves at bunching	No. of fingers	Bunch weight
Height		0.442 * 1		−0.0013 1		0.0074 1
		0.731 ** 2		0.405 2		0.263 *2
		0.679 ** 3		0.127 3		0.125 *3
	0.272 **	—	0.430 **	—	0.178 *	—
Number of hands		0.287 1	—	—	0.883 ** 1	0.313 1
		0.357 ** 2	—	—	0.834 ** 2	8.533 ** 2
		0.048 ** 3	—	—	0.926 ** 3	0.729 ** 3
			0.187 *	0.168	—	—
Girth			—	—	—	0.486 ** 1
			—	—	—	0.513 ** 2
			—	—	—	0.112 3
			0.414 **	0.282 **	0.300 **	—
Third leaf area				0.300 **	0.192	0.110
Number of leaves at bunching					—	0.047 1
					—	−0.013 2
					0.182	−0.059 3
Number of fingers						—
						—
						—
						0.521 **

* Significant at 5 percent probability level
** Significant at 1 percent probability level
1 AAA Group
2 AAB Group
3 ABB Group

with several sets of data for the Gros Michael variety in Jamaica and Central America (Simmonds, 1964).

Bunch weight

The only character that is positively and significanitly correlated with the bunch weight in all the three groups is the number of fingers per bunch. In AAA and AAB genomic groups, girth is found to be significantly correlated with bunch weight.

Summary

The nature of association between bunch weight and six other characters was studied in 127 banana varieties belonging to three different genomic groups at the Banana and Pinepple Research Station, Kannara, Kerala. The correlation between each pair of character was worked out separately for each group. It was found that only the number of fingers per bunch was positively correlated with bunch weight in all the three genomic groups. But in AAA and AAB groups, the girth of the pseudostem gave a clear indication of bunch weight.

സംഗ്രഹം

മൂന്നു വ്യത്യസ്ത ജീനോമിക ഗ്രൂപ്പുകളിൽപ്പെടുന്ന 127 വാഴയിനങ്ങളിൽ കുല യുടെ തൂക്കവും മറ്റു ആറു സ്വഭാവങ്ങളും തമ്മിലുള്ള സഹസംബന്ധപഠനങ്ങൾ കണ്ണാറ വാഴ ഗവേഷണ കേന്ദ്രത്തിൽ നടത്തുകയുണ്ടായി. സ്വഭാവങ്ങൾ തമ്മിലുള്ള എല്ലാവിധ സഹ സംബന്ധങ്ങളും മൂന്നു ഗ്രൂപ്പിലും പ്രത്യേകമായി വിശകലനം ചെയ്തതിൽ, കുലയുടെ തൂക്കവുമായി ധനാത്മക സഹസംബന്ധം പ്രകടിപ്പിച്ച ഏകസ്വഭാവം കായ്കളുടെ എണ്ണം മാത്രമാണെന്നുകണ്ടു. എന്നാൽ AAA, AAB എന്നീ രണ്ടു ഗ്രൂപ്പുകളിൽ, വാഴയുടെ കപടത്തണ്ടിന്റെ വണ്ണം കുല മുഴുപ്പിനെ വ്യക്തമായി സൂചിപ്പിക്കുന്നുവെന്ന് കാണുകയുണ്ടായി.

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