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Correlation Studies in Tall and Dwarf *indica* Rice Varieties.

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Correlation study taken up with 15 tall and dwarf *indica* rice varieties showed that panicle length and chaff number per panicle were correlated with yield. Grain number and number of panicle per clump were correlated to grain yield only in few varieties. Hundred grain weight was not correlated with yield. Grain breadth, length and plant height were also related to yield.

In tall *indica* rice varieties, Ramiah (1953) and Chandramohan (1964) have studied the association of different plant attributes with yield and in dwarf *indica* varieties, Rajagopalan *et al.* (1973) have observed the correlation of different metric traits with yield. In this investigation, correlation of different metric traits with yield was studied in 9 tall and 6 dwarf indica rice varieties, and the results are presented.

MATERIAL AND METHODS

Seeds of fifteen varieties of tall and dwarf *indicas* of different origin possessing wide range of variability in respect of the characters chosen for the study received from the Paddy Breeding Station, Coimbatore were sown in a trail laid out in randomized block design replicated thrice. The varieties were planted with a spacing of 20×10 cm and fertilized with 120 kg N, 60 kg P_2O_5 and 60 kg K_2O/ha. Ten plants from each plot were selected at random and studied. Simple correlation coefficients were calculated and the significance was tested by means of Fisher's 't' test.

RESULTS AND DISCUSSION

Among the dwarf *indicas*, IR. 8 recorded the maximum grain yield per plant, 100 grain weight, panicle length and grain length. Karuna registered the highest number of panicle per culm, grain number per panicle and chaff number of panicle. Maximum breadth of grain was observed in Jaya and the maximum thickness of grain in Bala. Among the tall *indica* types, ASD. 4 recorded the maximum grain yield per plant, length of grain and length of panicle. Number of panicle per culm was high in Co. 18. Grain number per panicle and chaff number per panicle were higher in Co. 31. TKM. 1 recorded higher 100 grain weight. Grain length and thickness were higher in Co. 29 (Table I).

In TKM. 2 and Co. 31 high positive correlation was observed between yield and grain number per panicle (Table II). This conforms the findings of Narahari and Pawar (1965) and Rajagopalan (1967). In Bala and Karuna, there was positive correlation between yield and number of panicles per clump. Similar

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TABLE I Yield and yield components and other metric traits of tall and dwarf *indica* rice varieties.

Varieties	Yield Components					
	Grain yield per plant (g) Y	No. of panicle per clump X_1	Grain No./ panicle X_2	100 grain weight (g) X_3	Panicle length (cm) X_4	Chaff No./ panicle X_5
N. 22	16.00	22.3	106.1	2.27	21.74	13.8
TKM. 2	9.95	17.0	107.6	2.44	22.82	31.5
Co. 29	11.35	24.3	99.0	2.25	19.52	31.5
IR. 8	37.51	18.9	99.0	2.95	21.10	38.3
Bala	8.35	22.0	102.2	1.70	17.44	58.20
Karuna	11.32	37.5	104.9	1.71	18.62	67.20
ASD. 4	16.34	20.9	84.8	2.90	25.16	23.4
ADT. 22	17.19	13.1	139.6	2.19	23.00	19.9
Co. 18	11.0	29.1	103.4	2.21	22.39	33.2
TKM. 6	9.0	22.6	93.7	1.80	23.14	20.8
TKM. 1	9.31	16.2	89.2	2.85	24.06	22.9
D. G. W. G.	18.54	21.1	99.6	2.47	20.79	41.4
Jaya	12.28	23.2	87.7	2.75	21.84	34.0
Co 31	14.15	20.1	187.7	2.35	24.04	56.2
Padma	12.22	18.0	93.7	2.05	18.64	30.0

TABLE I (Contd.)

varieties	Other metric traits			
	Grain length (mm)	Grain breadth (mm)	Grain thickness (mm)	Plant height (Cm)
N. 22	8.23	3.72	2.81	122.9
TKM.2	8.38	3.72	2.39	125.0
Co. 29	8.27	3.91	2.89	118.5
IR. 8	9.26	3.14	2.04	77.1
Bala	6.67	3.43	2.72	76.5
Karuna	6.81	3.39	2.45	66.6
ASD. 4	8.55	3.13	2.10	150.0
ADT. 22	8.13	3.13	1.96	155.8
Co. 18	8.14	2.88	1.88	132.0
TKM. 6	7.96	2.48	1.69	132.8
TKM. 1	8.05	2.47	2.08	132.4
D.G.W.G	7.97	3.19	1.86	86.0
Jaya	8.64	3.47	2.57	80.6
Co. 31	8.25	2.98	1.98	139.9
Padma	8.31	3.10	2.37	61.75

findings were reported by Chandramohan (1964) and Ghose *et al.* (1966). In Bala, ASD. 4, Co. 18, Jaya and Co. 31 positive correlation between yield and panicle length was noticed. Swamy Rao (1970), Chandramohan and Narayanaswamy (1973) reported similar findings Co. 18 showed very high correlation of yield with grain length. Chakravarthp (1940) and Huang (1967) also observed similar relationship. Among the varities studied, TKM. 1 had high correlation of yield with thickness of grain. Plant height was correlated with yield only in Co. 29, ADT 22 and Co. 18. Similar results were reported by Chandramohan and Narayanasamy (1973) but Rajagopalan *et al.* (1973) found the correlation to be low in dwarf *indica* types.

TABLE II Simple correlation co-efficients relating yield components with yield (Y)

Varieties	Yield Components				
	Number of panicle per clump X_1	Grain number per panicle X_2	100 grain weight X_3	Panicle length X_4	Chaff number X_5
N. 22	0.075	−0.400	−0.286	0 157	0.236*
TKM. 2	−0.865	0.437**	−0.166	−0.323	−0.480
Co. 29	0.077	−0.600	−0.428	−0.030	0.006
IR. 8	−0.110	−0.099	−0.515	−0.680	−0.506
Bala	0.239*	−0.011	−0.250	0.463**	0.193
Karuna	0.295**	−0.326	−0.088	−0.043	0.427**
ASD. 4	−0.221	−0.069	0.001	0.275**	−0.340
ADT. 22	0.020	−0.006	0.002	0.002	−0.310
Co. 18	0.319	−0.330	0.030	0.371**	−0.003
TKM. 6	−0.240	−0.251	0.010	0.199	−0.061
TKM. 1	0.061	0.041	−0.057	−0.143	−0.090
D.G.W.G.	−0.036	−0.480	−0.100	−0.256	0.420**
Jaya	−0.274	0.100	−0.280	0.502**	−0.064
Co. 31	0.136	0.520**	0.137	0.369**	−0.249
Padma	−0.499	−0.005	0.167	−0.067	0.802**

** Significant at 1% level Significant at 5% level

TABLE II (Contd.)

Varieties	Other metric traits			
	Grain length X_6	Grain breadth X_7	Grain thickness X_8	Plant height X_9
N. 22	0.131	−0.110	0.149	0.193
TKM. 2	0.700**	0.130	0.540**	−0.185
Co. 29	0.040	0.530**	−0.142	0.362**
IR. 8	0.200	−0.579	0.450**	0.082
Bala	0.759	−0.069	0.537**	0.080
Karuna	−0.002	−0.125	−0.145	0.031
ASD. 4	0.007	0.192	−0.645	0.188
ADT. 22	0.250**	0.333**	−0.104	0.432**
Co.18	0.879**	−0.738	−0.164	0.042**
TKM. 6	−0.794	0.192	0.216**	−0.100
TKM. 1	−0.480	0.500**	0.640**	−0.260
D.G.W.G.	−0.210	−0.140	0.170	0.180
Jaya	−0.075	0.478**	0.808**	−0.050
Co. 31	0.333**	−0.688	0.787**	0.346
Padma	−0.553	−0.196	0.114	−0.201

** Significant at 1% level * Significant at 5% level

In general, the correlation studies indicate that grain yield is related to certain quantitative traits. These components are related among themselves and the product of interaction among them contributes to the final yield. Therefore emphasis must be given for these metric traits to improve the yield in the breeding programme.

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