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DIVERGENCE ANALYSIS IN FINGER MILLET (*ELEUSINE CORACANA* GAERTN.)

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ABSTRACT

Genetic divergence of 20 varieties of finger millet grown across two environments was assessed using Mahalanobis' D^2 statistic. They were grouped in to 4 clusters under rainfed and 11 under irrigated conditions. Genetic diversity is not related to geographic diversity. Days to flowering, days to maturity, plant height, ear length, ear weight and grain weight contributed maximum to genetic diversity in both environments.

Key words: Genetic diversity, D^2 clusters, finger millet.

Mahalanobis' generalized distance concept [1] is adopted to measure genetic divergence and classify genetic stocks into distinct clusters, which may be considered as parents for evolving superior varieties.

MATERIALS AND METHODS

Twenty varieties of finger millet, representing different parts of India, were grown in two environments, viz., rainfed and irrigated conditions during kharif 1984 at Bangalore. The varieties were grown in 2-row plots (length 5.52 m) in completely randomised block design with three replications. The recommended package of practices were followed. The data on nine metric traits were recorded on ten randomly selected plants. The genetic divergence was assessed [1] and the varieties grouped on the basis of minimum generalized distance using the Tocher's method [2].

RESULTS AND DISCUSSION

The analysis of variance revealed highly significant differences among the varieties for all the characters studied, indicating genetic variability among the varieties. Based on D^2 values the varieties were grouped in four clusters under rainfed and 11 under irrigated conditions (Table 1). Under rainfed conditions, the maximum intracluster D^2 value (81.7)

Table 1. Cluster composition in finger millet

Rainfed			Irrigated		
cluster	No. of varieties	varieties and origin	cluster	No. of varieties	varieties and origin
I	3	HR-919, JNR-852, (M.P.), PR-202 (A.P.)	I	3	HR-1523, HR-8213, HR-911
II	12	HR-7-30-2, HR-1523, HR-8213, Indaf-8, HR-911, Indaf-3 RHO-2, Indaf-9 GE-3312, Indaf-5, Indaf-1, Indaf-7	II	3	HPB-7-6, RAU-8 (Orissa), PES-176 (U.P.)
			III	2	Indaf-5, GE-3312
III.	3	HPB-7-6, RAU-8 (Orissa), PES-176 (U.P.)	IV	3	HR-919, PR-202 (A.P.0, JNR-852 (M.P.)
			V	2	HR-374, KM-13 (U.P.)
IV.	2	HR-374, KM-13 (U.P.)	VI	2	Indaf-1, Indaf-7
			VII	1	Indaf-3
			VIII	1	Indaf-8
			IX	1	Indaf-9
			X	1	ROH-2
			XI	1	HR-7-30-2

Note. Place of collection indicated in parentheses, the other varieties are from Karnataka

was observed in cluster II, and the minimum (4.2) in cluster I. The maximum intercluster D^2 value was between clusters II and IV (602.9), while clusters III and IV were the closest (46.6).

Under irrigated conditions, the maximum intracluster value (54.8) was observed in cluster VII and the minimum (2.3) in cluster IV. The maximum intercluster D^2 value (632.2) was recorded between clusters V and VII, while it was minimum (9.1) between clusters I and XI. The irrigated environment resulted in a better discrimination among the genotypes (11 clusters) than the rainfed condition (4 clusters). The high yielding varieties distinguished themselves better under irrigation, indicating a better expression of their greater productive potential as compared to others under better management.

Days to flowering and maturity, plant height, ear length, ear weight, and grain weight contributed to genetic diversity under both situations.

The present findings reveal that in both environments, three clusters had identical composition, indicating their stability over environments. The varieties JNR-852, RAU-8, PES-176, KM-13 and PR-202 from different states forming clusters with the varieties from Karnataka suggested that genetic diversity need not necessarily be related to geographic

diversity. Hence, the choice of varieties for hybridization should be based on genetic rather than on geographic diversity. Varieties Indaf-3, Indaf-8, Indaf-9, ROH-2 and HR-7-30-2 (under irrigated conditions) were markedly diverse and may be considered as appropriate parents for evolving superior varieties.

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