

**Research Article****Multivariate and Clustering Analysis in Sweet Tamarind Seedling Progenies****D. Saraladevi, V. Ponnuswami, R.M. Vijayakumar and S.Chitra****Abstract**

Seventy eight seedling progenies of a sweet tamarind type collected from Dindigul region were planted at Horticultural College and Research Institute, Periyakulam during September 2005. These seedling progenies in pre bearing stage were evaluated to assess the variability existing in respect of growth parameters viz., tree height, girth and canopy spread. Among the three characters studied, canopy spread exhibited highest correlation with girth (0.61) than tree height (0.21). Tree height having highest correlation with girth (0.46) than canopy spread (0.21). In Bivariate fit analysis, TIS40, TIS 49 and TIS 52 were recorded the highest performance and TIS 53 had the lowest performance among the 78 progenies studied. In hierarchical clustering analysis, totally six groups were identified. In this, highest performers TIS 26, TIS 38, TIS 40, TIS 49 and TIS 52 were came under one group and the lowest performers TIS5, TIS 55, TIS 7, TIS 16, TIS69, TIS 72, TIS 24, TIS70, TIS 25, TIS 53, TIS 11, TIS 17, TIS 22, TIS 21 and TIS 46 were classified under the another group. Other four groups are moderately performing in nature. TIS 36 having dwarf statured and compact canopy may be exploited for easy harvesting and it can also be possible to accommodate more number of trees within the specified area leading to high density planting.

**Introduction**

Tamarind (*Tamarindus indica* L.) is a dicotyledonous perennial tree belongs to the family Fabaceae (leguminaceae) and sub family Caesalpinoideae. It is a diploid species with a chromosome number  $2n=26$  (Purseglove, 1987). It is mostly self sown or sown with seeds of unknown parentage, which result in wide variation among seedling progenies. Owing to its wide geographical distribution and adaptability to different agroclimatic zones, large genetic diversity is present in the seedling population. Due to cross pollination and predomination of seed propagation over a large period of time, it gives immense opportunity to locate elite trees having desirable horticultural traits (EL-Siddig, 2006). Present investigation was carried out to find out the variability on the basis of growth parameters of different seedling progenies so that valuable germplasm could be protected from being eroded and at the same time their utilization is also maximized under crop improvement programme.

**Materials and methods**

Seventy eight seedling progenies of a sweet tamarind type collected from Dindigul region of Tamil Nadu were planted at Horticultural College and Research Institute, Periyakulam during September 2005. These seedling progenies in pre bearing stage were evaluated to assess the variability existing in respect of growth parameters viz., tree height, girth and canopy spread. These characters in tamarind were also studied by Dhanumjaya and Subramanyam (2010). Among the 78 open pollinated seedling progenies 19 were recorded flowering during 2008-09 and 2009-10. However, the yield recorded was negligible during 2009. This similar trend is being noticed during 2010 also.

**Results and Discussion:**

Among the seedling progenies the tree height ranges from 2.0m (TIS 22) to 5.88m (TIS 40). A wide variation was exhibited in respect of tree girth which ranged between 20cm (TIS 53) to 53cm (TIS 23). The canopy spread among the seedling progenies ranged between 5.2m<sup>2</sup> (TIS 48) to 17.64m<sup>2</sup> (TIS 18) (Table.1). The results of present

studies of variability in tamarind are in accordance with the studies of Kenndy et al., (1998), Rao et al., (1999) and Patil Shekar and Hanamashetti (2009). Correlation studies provide reliable information on the nature and extent of relationship for bringing about improvement in yield and other traits (Fig.1). The correlation studies for floral traits in tamarind studied by Sanjay singh et al., (2008). In the present study, among the three characters studied, canopy spread having highest correlation with tree girth (0.61) than tree height (0.21). Tree height had highest correlation with tree girth (0.46) (Table 2). This relationship also exhibited in scatterplot matrix (Fig.1). In scatterplot matrix, fitting of trees into oval shape means that characters are more correlated.

In Bivariate fit analysis, TIS40, TIS 49 and TIS 52 were recorded the highest and TIS 53 had the lowest growth performance among the 78 progenies studied (Fig. 2). In hierarchical clustering analysis, totally six groups were identified (Fig.3). In this, highest performers TIS 26, TIS 38, TIS 40, TIS 49 and TIS 52 were came under one group and the lowest performers TIS 5, TIS 55, TIS 7, TIS16, TIS 69, TIS72, TIS 24, TIS70, TIS 25, TIS 53, TIS 11, TIS 17, TIS 22, TIS 21 and TIS 46 were classified under the another group. Other four groups are moderately performing in nature.

T 36 having dwarf statured and compact canopy may be exploited for easy harvesting and can be exploited in future programmes to increase the yield by accommodating more number of plants per unit area.

## References

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**Table.1. Growth parameters of different sweet tamarind seedling progenies**

Tree No.	Tree height (m)	Tree girth (cm)	Canopy spread (m <sup>2</sup> )	Tree No.	Tree height (m)	Tree girth (cm)	Canopy spread (m <sup>2</sup> )
T1	3.5	40	5.98	T42	4.1	37	9.45
T2	3.7	40	14.78	T43	3.85	44	11.72
T3	3.4	36	9.76	T44	4.55	53	11.22
T4	4.6	43	14.91	T45	5.29	43	10.23
T5	3.75	36	5.87	T46	3.82	43	5.67
T6	4.25	38	8.37	T47	4.1	42	8.42
T7	3.4	30	7.37	T48	2.5	37	5.2
T8	3.7	35	8.4	T49	5.76	46	13.65
T9	3.6	47	10.26	T50	5.65	43	8.68
T10	4.5	34	11.1	T51	5.02	40	5.64
T11	2.4	38	10.47	T52	5.6	48	13.85
T12	4.25	50	11.22	T53	2.68	20	1.56
T13	4	47	15.48	T54	4.38	39	7.15
T14	3.1	48	11.52	T55	3.8	33	4.84
T15	3.1	38	11.18	T56	3.79	38	10.33
T16	3.15	32	6.25	T57	4.85	36	6.67
T17	2.4	35	8.7	T58	4.85	44	8.22
T18	3.97	47	17.64	T59	4.52	34	5.13
T19	3.3	38	12.6	T60	4.37	37	3.15
T20	3.75	41	16.38	T61	4.85	44	7.98
T21	2.05	34	6.36	T62	4.2	33	7.59
T22	2	37	7.83	T63	3.5	35	8.99
T23	3.45	53	15.51	T64	5.2	39	11.1
T24	2.7	30	5.32	T65	3.8	32	9.6
T25	2.45	28	7.8	T66	4.72	35	10.22
T26	5	50	15.99	T67	5.25	33	10.15
T27	5.1	43	9.6	T68	4.57	40	10.23
T28	5.3	47	9.77	T69	3.7	29	3.49
T29	3.9	45	9.57	T70	2.52	29	5.5
T30	4.25	43	7	T71	4.15	38	6.38
T31	4.85	47	10.11	T72	3.35	30	4.4
T32	4.96	44	10.89	T73	4.9	38	3.8
T33	4.95	42	8	T74	4	37	7.16
T34	4.54	31	6.9	T75	4.8	36	5.46
T35	4.6	37	6.75	T76	4.5	40	3.06
T36	3.1	42	5.29	T77	5.15	43	6.75
T37	3.92	40	10.07	T78	5	36	8.1
T38	5.37	49	11.73	MEAN	4.14	39.38	8.91
T39	5.55	39	9.92	SE	0.107	0.72	0.38
T40	5.88	49	11.81	CD(5%)	0.25	1.7	0.89
T41	5.5	45	9.14	CD(1%)	0.36	2.43	1.28

**Table 2. Correlation among growth parameters of different sweet tamarind seedling progenies**

Characters	Tree height (m)	Tree girth (cm)	Canopy spread (m <sup>2</sup> )
Tree height (m)	1.00	0.46	0.22
Tree girth (cm)		1.00	0.62
Canopy spread (m <sup>2</sup> )			1.00

Fig.1. Scatterplot matrix for growth parameters

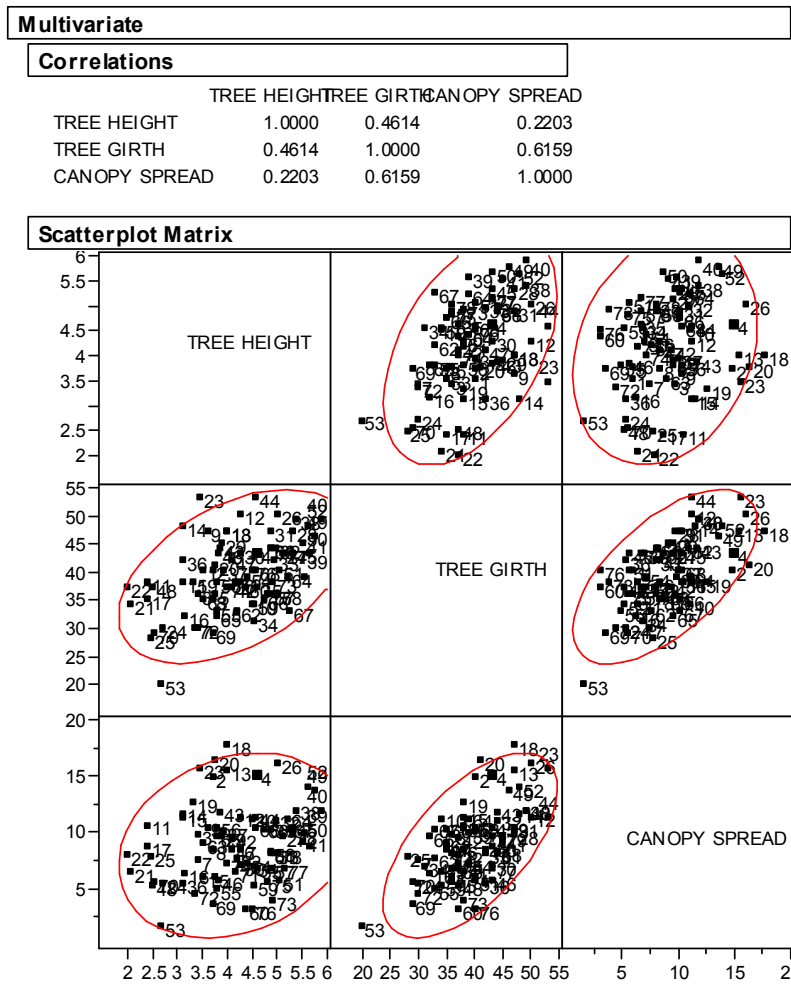
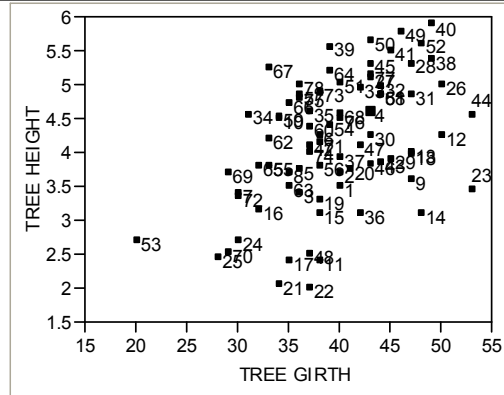
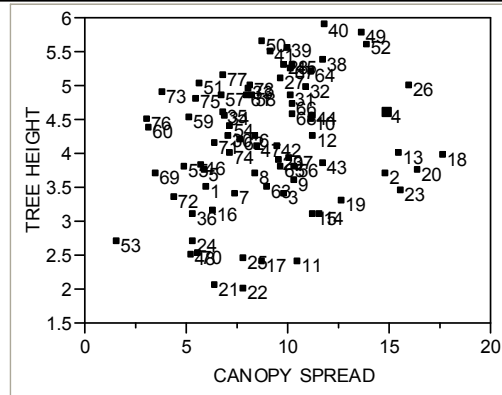


Fig.2 Bivariate fit analysis of growth parameters

**Bivariate Fit of TREE HEIGHT By TREE GIRTH**



**Bivariate Fit of TREE HEIGHT By CANOPY SPREAD**



**Bivariate Fit of CANOPY SPREAD By TREE GIRTH**

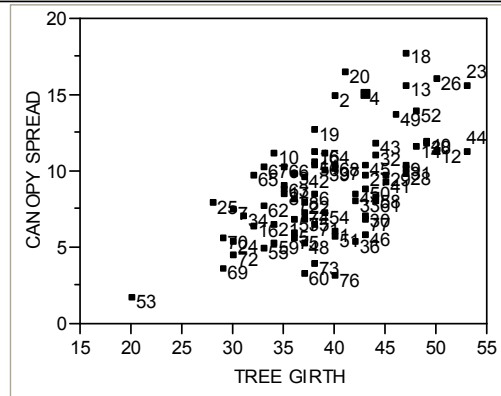
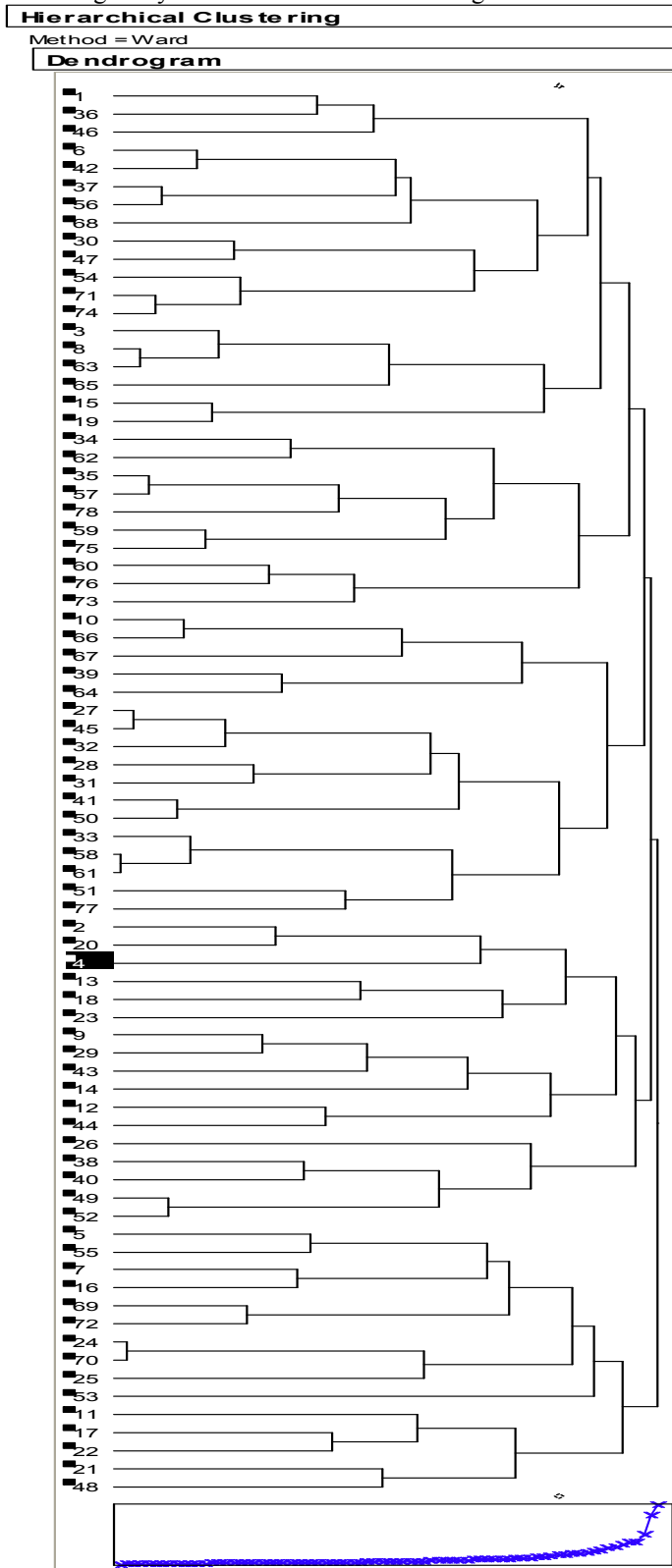


Fig.3 Hierarchical clustering analysis in sweet tamarind seedling



progenies