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Character association studies for fruit traits and yield in tamarind (*Tamarindus indica* L)

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Abstract

The present investigation Character association studies for fruit traits and yield in Tamarind (*Tamarindus indica* L) was carried out at AICRP for Dryland Agriculture and Department of Horticulture, Dr. Panjabrao Deshmukh Krishi Vidyapeeth, Akola, on twenty six tamarind genotypes with the objective to study the correlation between the different fruit traits and yield of tamarind genotypes. Correlation studies of different fruit and yield characters in tamarind genotypes revealed that the pod weight highly significant and positively correlated with pulp weight ($r=0.942$), seed weight ($r=0.866$), shell weight ($r=0.913$), rag weight ($r=0.835$) and seed number ($r=0.651$). However, Yield plant⁻¹ possessed positive correlation with pod width ($r = 0.215$), pod weight ($r = 0.290$), pulp weight ($r = 0.323$), seed weight ($r = 0.254$), shell weight ($r = 0.139$) and rag weight ($r = 0.128$). Whereas, yield plant⁻¹ had highly significant association with pod length ($r = 0.497$) and seed number ($r = 0.555$). The association of different fruit parameters and yield helps to understand the relationship between seedling originated tamarind genotypes.

Keywords: Tamarind, Correlation, fruit traits, yield.

Introduction

Tamarind (*Tamarindus indica* L.) is multipurpose tropical fruit tree crop belongs to dicotyledonous family Fabaceae of subfamily Caesalpinieae. It is a diploid species with chromosome number of $X= 12$ and $2x = 24$ (Purseglove, 1987) ^[5]. It is an excellent tree for social forestry and agroforestry. In the waste land development and dry land horticulture, tamarind assumes great significance due to its multiferous uses and capacity to withstand adverse agroclimatic conditions (Karale, 2002) ^[4].

In crop improvement program maintenance of superior genotypes is essential Therefore, evaluation of different fruit characters provide ample opportunity to understand different tamarind genotypes. Correlation studies help in finding out the degree of interrelationship among various characters and in evolving selection criteria for improvement. Hence in this line the research has been conducted with objective of the study the relationship between various fruit traits of tamarind genotypes.

Material and methods

Present investigation was conducted at 'AICRP for Dryland Agriculture and Department of Horticulture, Dr. Panjabrao Deshmukh Krishi Vidyapeeth, Akola. The plant material consisted of 25 seedling originated tamarind genotypes and one released variety 'Akola Smruti'. All cultural operations were uniformly practiced in experimental trees. The pods which were fully mature and well exposed to sun were collected from individual genotype just before harvesting. Eight pods were harvested randomly under each direction of the genotype (East, West, North, South). A total of 32 pods tree⁻¹ were collected and this material was used to record the observations on various fruit characters. Immediately on harvest the entire yield of pods from individual genotype was weighted and expressed as kg tree⁻¹.

Results and Discussion

The results indicated that, pod length was highly significant and positively correlated with pod width ($r=0.579$), pod weight ($r=0.888$), pulp weight ($r=0.843$), seed weight ($r=0.788$), shell weight ($r=0.767$), rag weight ($r=0.781$), seed number ($r=0.697$) and yield ($r=0.497$). The results are conformity with the findings of Shivanandam and Thimmaraju (1988) ^[6] in tamarind. There was highly significant and positive association between pod width and

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most significant character pod weight showed highly ($r=0.755$), pulp weight ($r=0.740$), seed weight ($r=0.591$), shell pod weight weight ($r=0.728$) and rag weight ($r=0.532$). The significant and positive correlation with pulp weight ($r=0.942$), seed weight ($r=0.866$), shell weight ($r=0.913$), rag weight ($r=0.835$) and seed number ($r=0.651$). Karale *et al.* (1999) [3] studied correlation in four types of tamarind (Straight and flat, straight and bulged, curved and flat, curved and bulged) and reported that, fruit weight of tamarind was significantly and positively correlated with pulp weight and pod length in all the 4 types. It was significantly correlated with shell weight and number of seeds pod^{-1} in all the four types except in straight and flat type. Highly significant and positive association of pulp weight was observed with seed weight ($r=0.685$), shell weight ($r=0.798$), rag weight ($r=0.760$) and seed number ($r=0.513$). The pulp weight was significantly and positively correlated with the pod length in all the types and with seed number in straight and bulged type and curved and flat type (Karale *et al.*, 1999) [3]. Divakara

(2008) [2] observed that, pulp weight pod^{-1} the most important economic trait, exhibited highest positive association with pod weight, vein weight, shell weight, pod width and pod length in tamarind. A similar result was reported by Challapilli *et al.* (1995) [1]. Seed weight had highly significant and positive correlation with shell weight ($r=0.760$), rag weight ($r=0.690$) and seed number ($r=0.794$). Karale *et al.*, 1999 [3] reported that shell weight was significantly correlated with pod length in the three types except in straight and flat type. Trait shell weight showed highly significant and positive correlation with rag weight ($r=0.801$) and seed number ($r=0.522$). Yield plant^{-1} possessed positive correlation with pod width ($r = 0.215$), pod weight ($r = 0.290$), pulp weight ($r = 0.323$), seed weight ($r = 0.254$), shell weight ($r = 0.139$) and rag weight ($r = 0.128$). However, yield plant^{-1} had highly significant association with pod length ($r = 0.497$) and seed number ($r = 0.555$). Therefore fruit character is one of the important character for evaluation and selection of elite trees of seedling origin.

Table 1: Estimation of simple correlation between different traits in tamarind

Characters	Pod length (cm)	Pod width (cm)	Pod weight (g)	Pulp weight (g)	Seed weight (g)	Shell weight (g)	Rag weight (g)	Seed number	Yield (kg plant^{-1})
Pod length (cm)	1.000	0.579**	0.888**	0.843**	0.788**	0.767**	0.781**	0.697**	0.497**
Pod width (cm)		1.000	0.755**	0.740**	0.591**	0.728**	0.532**	0.280	0.215
Pod weight (g)			1.000	0.942**	0.866**	0.913**	0.835**	0.651**	0.290
Pulp weight (g)				1.000	0.685**	0.798**	0.760**	0.513**	0.323
Seed weight (g)					1.000	0.760**	0.690**	0.794**	0.284
Shell weight (g)						1.000	0.801**	0.522**	0.139
Rag weight (g)							1.000	0.516**	0.128
Seed number								1.000	0.555**
Yield (kg plant^{-1})									1.000

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