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STUDIES ON SIMPLE CORRELATION MATRIX OF MESTA (*HIBISCUS SUBDARIFFA* L.) OF TWO YEARS IN A LOCATION

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Abstract

Mesta (*Hibiscus subdariffa* Linn .) was procured from the Central Research Institute for Jute and Allied Fibres (CRIJAF), Saheb Kuthi, Nilgunje, Barrackpore, Kolkata in the month of March, 2011 for carrying this PhD programme as this fibre crop has become known as high yielding emerging rough fibre crop for commercially cheap and viable fibre crop and is known as the most important fibre yielding crop next to jute.

Ten genotype of high yielding national recommended best cultivars of mesta *viz.* (i) RIN-003, (ii) RIN-301, (iii) RIN -322, (iv) RIN-92, (v) RIJ - 19, (vi) RIJ - 69, (vii) RIJ – 82, (viii) REX -55, (ix) REX – 57 and (x) REX – 49 in our location. Seeds were collected from CRIJAF, which were grown in the research field of the Crop Research Farm (CRF), Department of Botany of this University following Randomized Block Design (RBD) in 4 replications in two consecutive years *i.e.* in the month of March2011 and there after May 2012. Uniform agronomical measures were provided for uniform growth and development of the crop . Various metrical characters *viz.* (i) plant height (cm),(ii) branches per plant(no.), (iii) days to initiation of flower bud (d), (iv) appearance of first green pod (d), (v) fruits per plant (at 50% flowering stage) (no.), (vi) pod per plant (no.), (vii) weight of 100 grains (g), (viii) seed weight per plant (g) and (ix) yield per plant were observe and recorded all the data for analysis of co-variance (ANCOVA). Normally, the fibre crop like mesta is an pathogenic disease resistant crop. If so, abundance of pathogenic attack are noticed in the standing crop, this might be due to late sowing of the crop. But, it could survive easily by agronomic as well as fertilizer management of the crop. The analyses of co-variances like $\delta g_i g_j$, $\delta p_i p_j$ and $\delta e_i e_j$ have been calculated following Singh and Chaudhary (1995).

The aims and objects of this experimentation were to study the productivity, adaptability prevailing this environment to aware its co-heritability in this location.

Key words : Eco friendly, next to jute, location, correlation study, genotypic potentiality.

Introduction

Roselle (*Hibiscus sabdariffa Linn.*) belongs to the family Malvaceae. It is an annual herb cultivated for itsleaves, stem, seed and calyces (Umerchuruba, 1997). The crop is native to India but was introduced to other parts of the world such as Central America, West Indies and Africa. It is best grown in tropical and sub-tropical regions.

The physico-chemical characteristics of Roselle was studied and it was characterized as a highly acidic fruit with low sugar content. Succinic acid and oxalic acid were quantified as two predominant organic acids in Roselle. Roselle was found to contain higher amount of ascorbic acid compared to orange and mango (Wong *et al*., 2002).

A hundred gram serving of frozen roselle would supply 100 percent of current RDA (20 mg/day). It was found to be a fair source of vitamin A (Holden *et al.*, 1999).

It is also rich in riboflavin, niacin, calcium and iron (Qi, *et al.*, 2005 and Babalola *et al.*, 2000). It also contains antioxidants including flavonoids, gossypetine hibiscetine and sadderetine. Some of the anthocyanins of roselle identified by chromatographic process include delphinidin-3-sambubioside, cyaniding-3-sambubioside and delphinidin -3-glucose (Hong *et al.*, 1990). Many parts of roselle are

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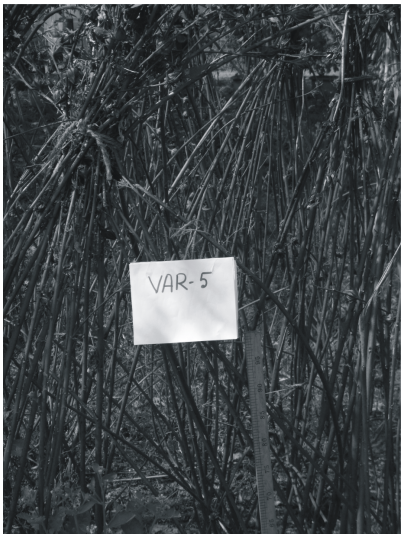
VAR-10


VAR-6


VAR-5

of value. The young leaves are eaten as cooked vegetables especially with soup.

The seeds are pounded into meal which is used as oily soup or sauce after roasting. Oil extracted from the seed is a substitute for castor oil while the residue is used in a fermented form as soup or cake (Aliyu, 2000). In countries like India, roselle calyces are utilized in producing refreshing beverages, jellies, jam, sauces and food preserves (Clydescale *et al.*, 1979). In Nigeria, the dried roselle calyces are prepared into a refreshing drink called 'zobo'. The drink is becoming popular because it is easily processed at home and served chilled, packaged in plastic bottles or polythene films. It serves as income generation source for many women.

The roselle is known as the *rosella* or *rosella fruit* in Australia. It is also known as 'Belchanda' among Nepalese, *Tengamora* among Assamese and "mwitha" among Bodo tribals in Assam, *Chukor* in Bengali, *Gongura* in Telugu, *Pundi* in Kannada, *Ambadi* in Marathi, LalChatni or Kutrum in Mithila] *Mathipuli* in Kerala, *chin baung* in Burma, *KraJiab Daeng* in Thailand, *som phor dee* in Lao PDR, *bissap* in Senegal, Guinea Bissau, Mali, Burkina Faso, Ghana, Benin and Niger, the Congo and France, *dah* or *dah bleni* in other parts of Mali, *wonjo* in the Gambia, *zobo* in western Nigeria (the Yorubas in Nigeria call the white variety Isapa (pronounced Ishapa)), Zoborodo in Northern Nigeria, *Chaye-Torosh* in Iran, *karkade,* in Egypt, Saudi Arabia, and Sudan, *omutete* in Namibia, *sorrel* in the Caribbean and in Latin America, *Flor de Jamaica* in Mexico, *Saril* in Panama, *grosella* in Paraguay, *rosela* in Indonesia, *asam belanda* in Malaysia. In Chinese it is *Luo Shen Hua*. In Zambia the plant is called *lumanda* in ciBemba, *katolo* in kiKaonde, or *wusi* in chiLunda.

Table 1 : Simple correlation matrix (δg_i and $\delta^2 gig_j$).

1.00	1.13	0.070	0.098	0.006	0.057	0.222	0.127	0.295
	1.00	0.182	0.25	0.01	0.626	0.57	0.33	0.76
		1.00	0.04	0.003	0.027	0.104	0.059	0.139
			1.00	0.002	0.0022	0.086	0.049	0.114
				1.00	-0.153	0.588	0.336	0.781
					1.00	0.14	0.08	0.18
						1.00	3.36	7.83
							1.00	0.25
								1.00

Table 2: Simple Correlation Matrix (δp_i and $\delta^2 pip_j$).

1.00	1.329	0.074	0,102	0.031	0.284	0.248	0.128	0.959
	1.00	0.193	0.266	0.082	-3.077	0.647	0.333	2.496
		1.00	0.048	0.015	0.134	0.117	0.060	0.452
			1.00	0.012	0.11	0.096	1.545	0.373
				1.00	0.753	0.658	0.339	2.54
					1.00	0.158	0.081	0.611
						1.00	3.40	23.62
							1.00	0.822
								1.00

Materials and Methods

Ten genotype of high yielding national recommended best cultivars of mesta *viz.* (i) RIN-003, (ii) RIN-301, (iii) RIN -322, (iv) RIN-92, (v) RIJ - 19, (vi) RIJ - 69, (vii) RIJ – 82, (viii) REX -55, (ix) REX – 57 and (x) REX – 49 in our location. Seeds were collected from CRIJAF, which were grown in the research field of the Crop Research Farm (CRF), Department of Botany of this University following Randomized Block Design (RBD) in 4 replications in two consecutive years *i.e.* in the month of March, 2011 and there after May, 2012. Uniform agronomical measures were provided for uniform growth and development of the crop. Possible metrical characters *viz.* (i) plant height (cm), (ii) branches per plant (no.), (iii) days to initiation of flower bud (d), (iv) appearance of first green pod (d), (v) fruits per plant (at 50% flowering stage) (no.), (vi) pod per plant (no.), (vii) weight of 100 grains (g), (viii) seed weight per plant (g) and (ix) yield per plant were observed and all the data were recorded properly for further computations. Analysis of co-variance were measured amongst the characters following Singh and Chaudhary (1995). The components of co-variance were also calculated which have been exhibited herein this context.

Variety	Names
1	RIN – 92
2	REX – 57
3	REX – 55
4	REX – 49
5	RIJ – 82
6	RIJ – 69
7	RIJ- 19
8	RIN – 322
9	RIN – 003
10	RIN - 301

Table 3: Simple Correlation Matrix (δe_i and $\delta^2 e_i e_j$).

1.00	-0.684	0.084	0.055	-1.123	9.361	2.213	0.735	87.41
	1.00	0.0143	0.009	0.190	1.586	0.374	0.124	14.80
		1.00	0.0006	0.013	0.113	0.026	0.008	1.055
			1.00	0.007	0.066	0.015	0.005	0.619
				1.00	1.418	0.335	0.111	13.244
					1.00	0.050	0.016	1.978
						1.00	2.106	249.85
							1.00	62.54
								1.00

Results and Discussion

In the table 1, it has found that only one negative value *i.e.* in case of r5, 6(-0.153). Incase of $r_{7.8}$ and $r_{7.9}$ were found to be high values *i.e.* 3.36 and 7.83 . which indicated maximum correlation values in those case of character combination of the crop. All other values were very much upto the mark of statistical or biometrical limits *i.e.* within the values of 1.00.

In the table 2, it has found that only one negative values *i.e.* in case of $r_{2.6}$ (-3.077). Incase of $r_{1.2}$, $r_{4.8}$, $r_{7.8}$ and $r_{7.9}$ were found to be high values *i.e.* 1.329, 1.545, 3.40 and 23.62, which is evident that normal limits of standard r-values and the excess value beyond 1.00.

Again, in the cases of $r_{1.2}$ and $r_{1.5}$ were shown negative correlation values whereas, $r_{1.6}$, $r_{1.7}$, $r_{1.9}$, $r_{2.9}$, $r_{3.9}$, $r_{4.9}$, $r_{5.6}$, $r_{5.9}$, $r_{6.9}$, $r_{7.8}$, $r_{7.9}$ and $r_{8.9}$ were found to be excessive high values. In this observation, it is prominent that there was maximum environmental fluctuation over the location for this crop. Relevant works done by Ashford and Willium (2006), Mahadevan and Shivali (2009), Morton (1987), Tsai and Ou (1996), Mohamad *et al.* (2002), Ageless (1999), Potter and Hotchkisss (1995), EiSherif and Sarwat (2007), Odigie *et al.* (2003), Tsengo *et al.* (2000), Mohamed *et al.* (2007), Ei Awad (2001), Naim and Ahamed (2010), Plotto *et al.* (2004), Abdallah *et al.* (2011), Duke (1993), Duke and Ducelliar (1993), Kays (2011).

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