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EVALUATION OF SELECTED DESHI JUTE (*Corchorus capsularis* L.) GERMPLASMS USING MORPHO-AGRONOMIC TRAITS

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ABSTRACT

Thirty-seven accessions of deshi jute germplasm collected from different sources were evaluated at Jute Research Regional Station, Kishoregonj during kharif season of 2016. The accessions were characterized for eight morpho-agronomic attributes as per *Corchorus* descriptor in order to select superior genotypes of jute. Considerable ranges of variability were observed in plant technical height, base diameter, node number, dry fiber weight and dry stick weight. The highest dry fiber weight was observed in accession 4986 (17.65 g/plant) followed by variety CVL-1 (16.64 g/plant), accessions 4460 (17.54 g/plant), 4484 (17.45 g/plant), 69 (13.62 g/plant) 75 (13.53 g/plant) and 67 (12.16 g/plant). From two years evaluation it was revealed that the twelve accessions viz. 4986, 4460, 4484, 58, 67, 69, 73, 84, 3936, 4474, 4706 and 4995 were performed better in most of the cases than the control variety CVL-1. These accessions may be used as the tools for varietal development program of deshi jute.
Key words: Deshi jute, evaluation, germplasm.

Introduction

Jute an herbaceous annual plant from the Tiliaceae family, mostly grown in Southeast Asian countries (José *et al*., 2009). It is used in the manufacture of a number of fabrics such as hessian cloth, sacking, scrim, carpet backing cloth (CBC), and canvas. It is also used as a raw material for the production of paper and pulp (IJO, 1994). Jute plays a very important role in Bangladesh economy as the country earns about 12-13% of total foreign currency by exporting jute and jute product (BJRI, 1998). Bangladesh, the second largest producer of jute, produces the best quality jute in the world and leads the export market (Rayhan *et al*., 2008). In addition, this crop is particularly important in Bangladesh where many small families depend on the income from growing and selling jute (Ghosh *et al*., 2013). Jute covered 6.95% of the total cultivated area occupying 0.5 million hectares and producing 0.96 million metric tons of jute fiber (AIS, 2003). In Bangladesh, the number of recommended jute varieties is limited in terms of fulfilling the requirements of wide agro-ecological conditions. Most of these varieties are quite old and have narrow genetic base and susceptible to various biotic and abiotic stresses such as insects, pests, diseases, drought, water logging, and low temperature and so on. All these factors combined with the increasing demand of jute in the world market, the new types of jute need to be developed to meet the various Agro-Industrial needs. In order to increase the frequency of desired genotypes in breeding progenies, superior parents with high breeding values are needed. However, the development of such parents is a long term and tedious job. Variability and genetic diversity are the fundamental laws of plant breeding which are major tools being used in parent selection for efficient breeding programme. For this region, firstly need to identify and evaluate promising and superior germplasms. The Gene Bank of Bangladesh Jute Research Institute (BJRI) has been conserved about 6023 germplasms of jute, kenaf, mesta and allied fiber of both indigenous and exotic origin. Out of this 2400 germplasms are *Corchorus capsularis*. Already about 443 germplasms are characterized as per *Corchorus* descriptor. Thirty-seven selected accessions of deshi jute (*Corchorus capsularis*) germplasms received from different sources to evaluate the superior germplasms for varietal development programme.

Materials and Methods

The experiment conducted at Jute Research Regional Station (JRRS), Kishoreganj by sowing seeds on 18 April, 2016. Thirty-seven entries along with the check variety CVL-1 was taken to this study. The experiment was laid out in RCBD design with three replications. Each accession was sown in 5 rows of 3 m length, spacing was 30 cm between rows, 5-6 cm between plants and 1 m between plots. Standard cultural and inter-cultural practices were followed. Plants were harvested at 120 days after sowing and post-harvest data were collected as per *Corchorus* descriptor. The significance of differences between the means of the treatments was evaluated by one-way analysis of variance followed by Duncan's Multiple Range Test at the significance level of 5% and least significance difference (LSD) test at 5% and 1% level of probability (Gomez and Gomez, 1984). The statistical software Excel and MSTAT-C computer package program developed by Russel (1986) were used for these analyses.

Results and Discussion

The mean performance of the major yield contributing characters and co-efficient of variation are presented in Table-1. The plant technical height at harvest (120 days) ranged from 2.52-3.91 m. The highest score was observed in accession 4986 (3.91 m/plant) followed by variety CVL-1 (3.53 m/plant), accessions 4460 (3.78 m/plant), 4484 (3.68 m/plant), 58 (3.58 m/plant), 3936 (3.55 m/plant), 4452 (3.55 m/plant), 4474 (3.55 m/plant) and 84 (3.55 m/ plant).

Highest leaf angle (45˚) was observed from accession number 5102 while accession number 73 showed the lowest leaf angle (38˚). Largest leaf length (18.56 cm) was observed from accession number 4986 while accession number 5102 showed smallest leaf length (8.22 cm). Highest leaf width (8.54 cm) was observed from accession number 2197 while accession number 5102 showed lowest leaf width (4.40 cm). Largest petiole length (8.56 cm) was observed from accession number 4986 while accession number 5102 showed smallest petiole length (4.21 cm).

Highest node number (96) was observed from accession number 4986 while accession number 5102 showed lowest node number (58).

Largest base diameter (27.98 mm) was observed from accession number 4986 while accession number 5102 showed smallest base diameter (16.87 mm).

Largest middle diameter (16.45 mm) was observed from accession number 4986 while accession number 5102 showed smallest middle diameter (9.52 mm).

Largest top diameter (7.96 mm) was observed from accession number 4986 while accession number 5102 showed smallest top diameter (3.45 mm). Largest core diameter (24.95 mm) was observed from accession number 4986 while accession number 5102 showed smallest core diameter (9.88 mm).

Dry fiber weight ranged from 7.12-17.65 g/plant. The highest dry fiber weight was observed in accession 4986 (17.65 g/plant) followed by variety CVL-1 (16.64 g/plant), accessions 4460(17.54 g/plant), 4484 (17.45 g/plant), 69(13.62 g/plant) 75(13.53 g/plant) and 67 (12.16 g/plant). This findings for fiber yield components in deshi jute germplasms is similar to the findings of Roy *et. al.* (2018).

Dry stick weight ranged from 18.69-43.95 g/plant. The highest score was recorded in accession 4986 (43.95 g/plant) followed by variety CVL-1 (42.97 g/plant), accessions 4460, 4484(43.56 g/plant), (43.25 g/plant), 3917 (34.14 g/plant), 67 (29.89 g/plant) and 67 (29.84 g/plant).

From two years evaluation it was revealed that the twelve accessions viz. 4986, 14460, 4484, 58, 67, 69, 73, 84, 3936, 4474, 4706 and 4995 were performed better in most of the cases than the control varieties CVL-1. These accessions may be used for variety development program.

Table 1. Range, mean and co-efficient of variation (CV %) of twelve characters of thirty-seven selected *Corchorus capsularis* germplasms

Acc. No.	TH (m)	LA (dg)	LL (cm)	LW (cm)	PL (cm)	Node no.	BD (mm)	MD (mm)	TD (mm)	CD (mm)	DFW (g)	DSW (g)
55	3.22	40	14.52	6.45	6.85	75	22.15	12.45	5.65	18.54	10.85	24.47
56	2.89	40	15.84	6.44	6.45	78	23.65	11.81	5.92	18.85	10.52	25.55
58	3.58	40	14.52	5.85	5.52	69	21.94	11.42	5.25	17.84	8.64	29.78
2197	3.25	40	15.25	5.85	5.84	78	21.45	13.02	5.35	19.22	9.55	25.37
65	2.87	38	17.11	6.28	6.57	74	22.62	12.52	6.35	18.65	11.86	27.38
67	3.54	40	16.02	5.56	7.55	82	22.95	12.85	6.44	18.74	12.16	29.89
69	3.53	42	15.72	5.25	5.45	76	22.52	11.35	5.35	18.56	13.62	25.26
71	3.56	40	14.12	5.54	5.95	85	23.25	11.12	5.64	20.15	10.55	26.61
CVL -1	3.53	40	14.38	5.56	5.88	81	22.64	12.25	5.03	19.41	16.64	42.97
73	3.54	38	17.45	6.02	5.72	65	21.37	12.24	4.23	17.35	8.71	22.62
75	3.52	40	16.84	8.04	8.38	75	24.34	15.66	7.81	24.55	13.53	29.84
84	3.55	40	17.84	7.04	7.24	75	23.95	13.69	5.81	20.55	10.53	26.84
87	3.36	42	8.92	6.34	6.78	72	23.05	12.48	5.48	18.86	9.76	25.88
892	3.25	44	14.36	6.18	6.54	87	21.37	12.51	4.66	17.04	10.74	27.86
897	3.47	40	16.62	6.52	6.68	63	23.06	12.27	5.36	19.36	11.18	29.53
2236	3.24	40	14.48	5.86	6.19	65	21.56	9.88	4.99	17.81	7.25	25.71
2281	2.96	42	13.76	4.92	4.38	59	19.56	10.53	4.94	16.86	9.27	19.69
3410	3.35	40	13.76	5.38	5.82	79	22.84	12.27	4.28	18.47	9.54	23.85
3874	3.52	40	14.18	5.58	6.34	80	22.75	12.07	3.81	19.37	9.18	24.28
3914	3.47	44	15.58	6.64	5.54	67	24.82	14.34	5.38	20.85	9.79	25.82
3917	3.21	40	15.15	5.46	6.12	87	19.63	12.87	3.94	19.75	12.25	34.14
2197	3.54	40	13.44	5.23	4.66	67	23.86	13.42	4.72	19.53	10.82	26.84
3936	3.55	40	13.46	5.16	5.92	89	22.06	11.82	5.28	18.43	8.51	21.72
4374	3.49	42	16.71	5.53	5.96	85	22.96	12.14	4.92	19.55	9.74	22.92
4452	3.55	42	15.56	6.32	6.76	83	21.52	11.78	5.69	18.07	9.19	23.17
2197	3.29	40	14.98	6.08	6.72	70	18.77	11.53	4.31	15.75	9.15	25.92
4460	3.78	42	15.56	6.98	6.44	67	22.92	12.85	4.65	18.99	17.54	43.25
4468	3.47	40	14.06	5.84	6.17	67	20.02	11.61	4.88	16.65	8.78	23.12
4474	3.55	42	14.72	5.44	5.64	71	22.18	12.69	4.59	18.88	10.43	26.89
4484	3.68	40	18.46	6.72	7.19	83	23.92	13.33	5.67	19.91	17.45	43.56
4706	3.58	42	16.22	6.35	7.36	80	21.46	11.57	4.25	17.98	10.19	28.74
4879	3.24	40	14.84	5.73	7.18	79	20.18	11.78	6.37	19.95	11.85	27.82
2197	3.45	42	13.73	8.54	5.66	75	19.94	11.12	3.85	16.47	10.24	25.38
4986	3.91	40	18.56	5.82	8.56	96	27.98	16.45	7.96	24.95	17.65	43.95
4995	3.54	40	14.19	5.73	5.53	60	17.03	9.89	4.15	13.95	8.52	21.26
5095	3.15	40	14.22	6.64	5.65	68	17.83	9.83	4.47	15.01	9.48	25.58
5102	2.52	45	8.22	4.40	4.21	58	16.87	9.52	3.45	9.88	7.12	18.79
5134	2.95	40	15.28	6.66	5.84	66	20.01	11.67	4.33	15.49	7.52	22.92
Range	2.52-3.91	38-45	8.22-18.56	4.40-8.54	4.21-8.56	58-96	16.87-27.98	9.52-16.45	3.45-7.96	9.88-24.95	7.12-17.65	18.79-43.95
Mean	3.39	40.71	14.96	6.05	6.24	74.63	21.87	12.17	5.14	18.43	10.8	27.5
CV (%)	6.85	3.84	9.88	10.52	12.55	10.58	9.81	10.56	13.15	12.25	18.63	14.52

* Check Variety

Technical height (TH), leaf angle (LA), leaf length (LL), leaf width (LW), petiole length (PL), base diameter (BD), middle diameter (MD), top diameter (TD), core diameter (CD), dry fiber weight (DFW), dry stick weight (DSW)

Conclusion

The experiment demonstrates that the studied genotypes were highly variable for all of the morpho-agronomic traits and the accessions of *C. capsularis* 4986, 4460, 4484, 58, 67, 69, 73, 84, 3936, 4474, 4706 and 4995 performed better in respect of major yield contributing traits than the control CVL-1.

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