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Assessment of genetic divergence of *deshi* jute (*Corchorus capsularis*) germplasms by using phenotypic characters

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Abstract

Twenty-two morpho-agronomic traits of 42 jute genotypes, including 4 varieties with 38 accessions of *C. capsularis* were evaluated to assess the extent and patterns of variability and their relationships. Seed traits exhibited a wider range of variation than fiber traits. Qualitative traits were also the most informative. Considerable ranges of variability were observed in stem colour, petiole colour, stipule colour, plant technical height, base diameter, dry fibre weight and dry stick weight. Based on major yield contributing characters' accessions 628, 633, 635 and 646 performed better in most of the cases than the control variety CVL-1, CVE-3, BJC-7370 and BJC-83.

Key words: Qualitative trait, fibre yield, plant base diameter, petiole length, pod length, seed yield

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Introduction

Jute (*Corchorus* spp.) is a natural fibre crop and is second in the world after cotton in terms of global production, consumption and availability. It is a completely biodegradable, recyclable and eco-friendly lingo-cellulose fibre (Kundu, 1951; Mir *et al*., 2008). The jute fibres are derived from the bark of the plant. The genus *Corchorus* belongs to the family *Malvaceae*, which is composed of approximately 100 species (Saunders, 2001). Of these, two species (*Corchorus capsularis* L. and *Corchorus olitorius L.*) are widely cultivated for natural fibre in areas distributed throughout the tropical and sub-tropical regions of the world, particularly in Asia, Africa and Latin America (Kundu, 1951; Edmonds, 1990; Hossain *et al*., 2002). The most common use of jute fibre is in packaging materials such as hessian, sacking and ropes. A variety of products, such as floor coverings, home textiles, agro-textiles, blankets, handicrafts and fashion accessories, are also made from jute. In recent years, jute has been used for making pulp and papers in the paper industry (Mohiuddin *et al*., 2005).

The fiber yield of jute in Bangladesh, the second largest producer in the world, has slightly increased from 1.74 t ha-1 in 1999-2000 to 2.22 t ha-1 in 2009-2010 (BBS, 2010), despite the expanding global demand for natural fibre. In addition, seed is a basic input for any crop production program, which leads inevitably for agricultural change of a country but Bangladesh has been facing an acute shortage of quality jute seed every year (Hossen *et al*., 2008), due to the lack of work on breeding new superior varieties based on fibre and seed yield as well as for insect and disease attached. For controlling the common jute hairy caterpillar, egg parasitoids are most efficient to control as bio-agent (Islam *et al.*, 2002). Now-a-days, various pest management programs are also available for safe environmental crop production (Islam, 2012; Islam and Ando, 2012). Furthermore, the two cultivated species of jute are different in terms of growth habitat, disease and pest resistance and characteristics related to fibre and seed yield (Kundu, 1951; Edmonds, 1990). For example, *C. olitorius* is relatively tolerant to diseases and pests and produces a stronger fibre than *C. capsularis*, whereas *C. capsularis* is more resistant to water logging and drought (Roy *et al.*, 2006). Combining the desirable traits of the two species would be advantageous; however, these species cannot be crossbred, possibly because of the presence of a strong sexual incompatibility barrier between them (Patel and Datta, 1960). Nevertheless, Islam and Rashid (1960) and Choudhuri and Mia (1962) have succeeded in producing hybrids. Moreover, advanced technologies such as somatic hybridization, chromosome doubling, embryo rescue and genetic transformation could be used to overcome the sexual incompatibility problems (Saha *et al*., 2001; Ghosh *et al*., 2002). If jute is to be genetically improved, the divergent genotypes must first be identified, the genetic variability characterized and the degree and nature of the associations of various traits with yield determined. The gene bank of the Bangladesh Jute Research Institute has 5,936 accessions of jute and allied fibre crops (Haque *et al*., 2007) that could be used to accomplish this goal. Although some diversity studies were carried out with molecular markers to evaluate the genetic variation in jute (Basu *et al*., 2004; Roy *et al*., 2006). Thirty-eight accessions of deshi jute (*Corchorus capsularis*) germplasm received from different sources were characterized for morpho-agronomic traits to evaluate the promising types.

Materials and Methods

The experiment was conducted by sowing seeds on 7 April, 2016. Thirty-eight entries along with the check varieties CVE-3, CVL-1, BJC-7370 and BJC-83 were taken to this study. 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. Pigmentation data on stem colour, leaf colour, vein colour, petiole colour, stipule colour, bud colour, and fruit colour were collected at 60 days after sowing and pre-bud stage. Plants were harvested at 120 days after sowing and post-harvest data were collected as per *Corchorus* Descriptor. Data were analyzed following standard statistical procedures.

Results and Discussion

The analysis of variance (ANOVA) for fibre yield components in deshi jute germplasm is described in Table 1.

Table 1. Analysis of variance (mean square) for traits of *C. capsularis*.

Source of variation	df	Tech ht (m)	Leaf Angl (dg)	Leaf Lnth (cm)	Leaf Width (cm)	Petiol Lnth (cm)	Node No.	Base Dia (mm)	Middle Dia (mm)	Top Dia (mm)	Core Dia (mm)	Dry Fibre wt. (g)	Dry Stick wt. (g)
Replication	2	0.020	6.768	0.099	0.065	0.003	12.167	0.177	0.042	0.044	0.006	0.086	1.179
Accessions	42	0.414**	28.634**	6.065**	1.850**	4.095**	240.936**	56.407**	9.281**	1.928**	24.003**	22.029**	192.546**
Error	82	0.021	9.670	0.129	0.048	0.053	8.386	0.188	0.151	0.067	0.265	0.222	2.385

** = Significant at 1% level of probability.

The ANOVA revealed significant difference as the source of variation, for the traits plant height (m), base diameter (cm), fibre weight (g/plant) and stick weight (g/plant). All parameters are significantly different at 1% level of significance. The findings of the analysis of variance (ANOVA) for fibre yield components in deshi jute germplasm are similar to the findings of Roy *et al.* (2018).

The mean performance of the major yield contributing characters and co-efficient of variation are presented in Table 2.

Table 2. Range, Mean and co-efficient of variation (CV %) of twelve characters of forty *Corchorus capsularis* germplasm.

Acc. No.	Tech ht (m)	Leaf Angl (dg)	Leaf Lnth (cm)	Leaf Width (cm)	Petiol Lnth (cm)	Node No.	Base Dia (mm)	Middle Dia (mm)	Top Dia (mm)	Core Dia (mm)	Dry Fibre wt. (g)	Dry Stick wt. (g)
601	2.16	51	12.65	5.22	3.12	51	15.21	7.48	4.12	11.41	13.23	37.58
BJC-7370	2.98	45	14.72	5.66	4.81	62	19.15	10.23	4.65	17.32	15.48	41.25
602	3.12	52	15.17	6.23	5.12	65	17.29	12.44	5.25	18.58	17.95	48.65
605	2.65	53	13.66	5.89	5.25	54	13.75	8.56	4.26	12.56	10.33	29.84
BJC-83	3.11	46	14.58	6.22	6.11	69	23.25	12.33	5.36	18.25	18.54	52.85
606	2.69	45	13.24	5.78	5.54	52	12.69	8.58	4.15	12.47	13.65	38.69
CVL-1	3.19	48	14.65	5.93	6.22	68	23.58	12.45	5.28	18.36	18.52	52.41
609	2.93	47	12.41	5.82	5.88	55	21.36	8.85	4.79	16.24	17.84	48.95
611	2.86	50	11.88	5.11	5.15	54	20.58	9.58	4.96	16.87	16.22	45.87
CVE-3	2.82	52	13.63	6.03	5.29	51	18.47	10.23	4.57	18.15	16.14	44.16
612	2.99	51	14.11	6.78	6.08	56	22.56	12.14	5.04	17.26	17.54	49.25
613	3.17	53	14.97	6.74	6.78	72	24.12	12.49	5.12	18.59	18.19	52.13
620	3.22	46	14.22	6.77	6.85	73	24.51	12.58	5.23	18.62	18.52	51.28
621	2.65	50	12.48	5.12	5.36	52	16.22	8.51	4.11	12.41	15.17	43.27
624	3.25	55	15.49	7.22	6.92	71	24.67	12.78	5.54	18.56	18.53	50.58
625	2.48	54	12.28	5.52	4.21	49	12.14	8.26	3.95	10.25	9.21	26.47
626	3.12	46	14.52	6.59	6.65	69	23.98	12.15	5.25	17.98	18.65	52.63
627	3.36	50	15.77	7.14	6.92	72	24.77	12.27	5.28	18.57	18.56	52.55
628	3.79	51	16.86	7.97	7.85	78	25.13	13.23	6.77	20.54	19.98	56.48
630	2.88	49	13.23	6.96	5.99	61	19.36	10.29	4.87	13.27	15.69	44.36
631	2.96	53	14.11	6.85	6.07	59	20.58	10.58	4.12	16.59	16.25	46.49
632	3.19	53	14.97	6.81	6.84	68	24.45	12.48	5.29	18.48	18.29	51.21
633	3.56	47	16.65	7.78	7.61	76	24.98	13.06	6.35	20.09	19.32	55.89
634	2.77	52	11.66	4.98	4.62	55	21.56	9.88	4.58	12.95	17.25	49.78
635	3.44	46	15.89	7.47	7.24	74	24.75	12.86	6.08	19.83	18.92	53.69
636	2.83	48	13.76	6.25	5.27	51	21.59	1025	4.89	14.65	16.36	45.89
637	2.98	55	13.62	5.97	3.79	61	23.55	11.65	5.21	15.28	17.84	48.57
638	2.95	54	14.14	6.58	5.25	60	16.25	10.47	5.22	16.82	17.58	49.57
639	2.69	52	13.92	5.87	5.27	58	14.15	9.58	4.25	15.73	12.56	34.51
640	*3.58*	46	16.55	7.25	7.49	75	25.04	13.11	6.52	20.25	19.45	54.88
641	1.76	48	10.67	4.55	2.96	46	11.24	6.45	3.14	9.76	7.85	17.59
642	3.29	49	15.93	7.14	7.27	71	23.56	12.86	6.23	18.74	18.13	50.32
645	2.87	52	13.87	6.59	5.83	58	16.54	11.25	4.54	16.51	16.24	45.58
646	3.39	54	15.98	7.33	7.18	72	24.29	12.45	6.55	19.89	18.85	53.67

649	3.32	48	15.46	7.09	7.08	71	23.96	12.14	6.11	19.24	18.12	52.41
659	3.18	53	15.23	7.12	7.02	69	23.55	12.23	5.98	18.92	17.96	49.52
660	2.59	55	12.87	5.88	5.21	53	12.44	8.56	4.56	15.53	14.25	39.63
674	2.93	54	13.21	6.21	5.32	56	21.87	11.25	4.77	17.54	16.35	46.59
676	2.77	49	13.45	6.23	5.19	55	20.45	10.21	4.58	14.86	15.39	43.21
678	3.02	47	14.87	6.78	6.93	68	23.56	12.23	4.25	18.52	17.79	48.98
679	2.71	50	12.99	6.22	5.81	51	14.25	10.51	4.73	14.15	15.29	42.65
680	3.09	53	15.05	7.02	6.75	66	22.59	11.99	4.42	18.58	16.46	46.45
Range	**1.76-3.79**	**45-55**	**10.67-16.86**	**4.55-7.97**	**2.96-7.85**	**46-78**	**11.24-25.13**	**6.45-13.23**	**3.14-6.77**	**9.76-20.54**	**7.85-19.98**	**17.59-56.48**
Mean	**2.98**	**50.28**	**14.17**	**6.39**	**5.90**	**62.07**	**20.42**	**10.98**	**5.01**	**16.64**	**16.53**	**47.67**
CV(%)	**11.58**	**6.79**	**6.28**	**13.56**	**17.58**	**14.29**	**15.67**	**12.48**	**15.85**	**16.72**	**21.39**	**22.65**

* = Check Variety

Pigmentation data on stem colour, leaf colour, vein colour, petiole colour, stipule colour, bud colour, and fruit colour are presented in Table 3. The plant technical height at harvest (120 days) ranged from 1.76-3.79. The highest score was observed in accession no. 628 (3.79 m/plant), followed by accessions 633 (3.56 m/plant), accessions 635 (3.44 m/plant), accessions 646 (3.39 m/plant). Dry fibre weight ranged from 7.85-19.98 g/plant. The highest dry fibre weight was observed in accession no. 628 (19.98 g/plant) and followed by accession 633 (19.32 g/plant), accession 635 (18.92 g/plant) and accession 646 (18.85 g/plant). Dry stick weight ranged from 17.59-56.48g/plant. The highest score was recorded in accession 628 (56.48 g/plant) followed by acc. no. 633 (55.89 g/plant), acc. no.635 (53.69 g/plant), and 646 (53.67 g/plant). Similar result was found in Annual Research Report (2016) BJRI in different accession. Among the accession characterized, four viz. accession 628, 633, 635 and 646 performed better in respect of major yield contributing characters than the controls CVE-3, CVL-1, BJC-7370 and BJC-83.

The phenotypic coefficient of variation (PCV) was found to be greater than the genotypic coefficient of variation (GCV) in case of all the characters (Table 4). The percentage (%) of PCV of plant height 13.07, base diameter 21.30, dry fibre weight 16.55 and dry stick weight 17.50 and the percentage (%) of GCV of plant height 12.13, base diameter 21.19, dry fibre weight 16.31 and dry stick weight 17.18 were found in this study. The GCV and PCV were found to differ significantly for all the fibre yield components. This is in agreement with the findings of Sawarkar *et al.* (2014). The percentage (%) of heritability of plant height 86.18, base diameter 99.01, dry fibre weight 97.04 and dry stick weight 96.37 and the percentage (%) of genetic advance (GA) of plant height 23.20, base diameter 43.44, dry fibre weight 33.09 and dry stick weight 34.74 were found in this study. The heritability and genetic advance (% of mean) were also found to be high for all the traits and this is similar to the findings of Roy *et al.* (2015) who reported that higher heritability and genetic advance for fibre yield components of deshi jute.

All genotypes were distributed in distinct divergent clusters. The distribution of the deshi jute germplasm accessions exhibiting higher fibre yield along with the different morpho agronomic factors in the five groups of divergent clusters are presented in (Table 5 and Figure 1). In the first group of divergent clusters consisting of cluster-I, six genotypes having higher average rank namely serial no. of Ac 01, Ac 04, Ac 16, Ac 29, Ac 31 and Ac 37 belonged to cluster-I. In the second group of divergent clusters consisting of cluster-II, ten genotypes namely serial no. of Ac 02, Ac 06, Ac 08, Ac 09, Ac 14, Ac 20, Ac 24, Ac 26, Ac 39 and Ac 41 belonged to cluster-II. In the third group of divergent clusters consisting of cluster-III, nine genotypes namely serial no. of Ac 03, Ac 10, Ac 11, Ac 21, Ac 27, Ac 28, Ac 33, Ac 38 and Ac 42

Table 3. Pigmentation of *Corchorus capsularis* germplasm along with check variety CVE-3, CVL-1, BJC-7370 and BJC-83.

Acc. No.	Stem color	Leaf color	Vein Color	Petiole color	Stipule	Stipule color	Bud color	Fruit Color	Branch habit	Leaf shape
601	G/R	G	G	G/R	+	G	0	Brown	Rudimentary	0vate
BJC-7370	G	G	G	G	+	G	0	Brown	Non branch	Ovate
602	G	G	G	G/R	+	G	0	Brown	Non branch	Ovate
605	G/R	G	G	G/R	+	G	0	Brown	Rudimentary	Ovate-lanceolate
BJC-83	G	G	G	G	+	G	0	Brown	Non branch	Ovate-lanceolate
606	G/R	G	G	G/R	+	G	0	Brown	Sparse	Ovate-lanceolate
CVL-1	G	G	G	G	+	G	0	Brown	Non branch	Ovate-lanceolate
609	G	G/R	G	G/R	+	G/R	0	Brown	Rudimentary	Ovate-lanceolate
611	G	G	G	G/R	+	G	0	Brown	Non branch	Ovate-lanceolate
CVE-3	G	G	G	G/R	+	G	0	Brown	Non branch	Ovate-lanceolate
612	G	G	G	G/R	+	G	0	Brown	Non branch	Ovate-lanceolate
613	G/R	G	G	G/R	+	G	0	Brown	Rudimentary	Ovate-lanceolate
620	G/R	G	G	G/R	+	G	0	Brown	Non branch	Ovate-lanceolate
621	G/R	G	G	G/R	+	G	0	Brown	Rudimentary	Ovate-lanceolate
624	G/R	G	G	G/R	+	G	0	Brown	Non branch	Ovate-lanceolate
625	G	G	G	G/R	+	G	0	Brown	Rudimentary	Ovate-lanceolate
626	G	G	G	G/R	+	G	0	Brown	Non branch	Ovate-lanceolate
627	G	G	G	G/R	+	G	0	Brown	Non branch	Ovate-lanceolate
628	G	G	G	G/R	+	G	0	Brown	Non branch	Ovate-lanceolate
630	G/R	G	G	G/R	+	G	0	Brown	Non branch	Ovate-lanceolate
631	G	G	G	G/R	+	G	0	Brown	Non branch	Ovate-lanceolate
632	G	G	G	G/R	+	G	0	Brown	Non branch	Ovate
633	G	G	G	G/R	+	G	0	Brown	Non branch	Ovate-lanceolate
634	G/R	G	G	G/R	+	G/R	0	Brown	Non branch	Ovate-lanceolate
635	G/R	G	G	G/R	+	G	0	Brown	Non branch	Ovate-lanceolate
636	G/R	G	G	G/R	+	G	0	Brown	Non branch	Ovate-lanceolate
637	G/R	G	G	G/R	+	G	0	Brown	Non branch	Ovate
638	G/R	G	G	G/R	+	G	0	Brown	Non branch	Ovate
639	G	G	G	G/R	+	G	0	Brown	Non branch	Ovate-lanceolate
640	R	G	G	G/R	+	G/R	0	Brown	Non branch	Ovate-lanceolate
641	G/R	G	G	G/R	+	G	0	Brown	Non branch	Ovate-lanceolate
642	G	G	G	G/R	+	G	0	Brown	Non branch	Ovate-lanceolate
645	G/R	G	G	G/R	+	G	0	Brown	Non branch	Ovate-lanceolate
646	G	G	G	G/R	+	G	0	Brown	Non branch	Ovate-lanceolate
649	G/R	G	G	G/R	+	G	0	Brown	Non branch	Ovate-lanceolate
659	G	G	G	G/R	+	G	0	Brown	Non branch	Ovate-lanceolate
660	G	G	G	G/R	+	G	0	Brown	Non branch	Ovate-lanceolate
674	G/R	G	G	G/R	+	G	0	Brown	Non branch	Ovate
676	G/R	G	G	G/R	+	G	0	Brown	Non branch	Ovate-lanceolate
678	G/R	G	G	G/R	+	G	0	Brown	Non branch	Ovate-lanceolate
679	G/R	G	G	G/R	+	G	0	Brown	Non branch	Ovate-lanceolate
680	G/R	G	G	G/R	+	G	0	Brown	Non branch	Ovate-lanceolate

G = Green, R = Red, LR = Light Red, "+" = Present, * Check variety.

Table 4. Variability, heritability (h2b), genetic advance (GA) and GA in percent of mean for twelve yield and its related characters of *C. capsularis.*

SL. No.	Characters	Minimum	Maximum	Mean	Genotypic variance (d^2g)	Phenotypic variance (d^2p)	GCV (%)	PCV (%)	Heritability (h^2b)	GA	GA(%)
1	Tech ht (m)	1.76	3.79	2.98	0.13	0.15	12.13	13.07	86.18	0.69	23.20
2	Leaf Angl (dg)	45.00	55.00	50.29	6.321	15.99	5.00	7.95	39.53	3.26	6.48
3	Leaf Lnth (cm)	10.67	16.86	14.18	1.979	2.108	9.92	10.24	93.88	2.81	19.81
4	Leaf Width (cm)	4.55	7.97	6.40	0.60	0.65	12.12	12.59	92.60	1.54	24.02
5	Petiol Lnth (cm)	2.96	7.85	5.91	1.35	1.40	19.65	20.03	96.22	2.35	39.71
6	Node No.	46.00	78.00	62.07	77.517	85.903	14.18	14.93	90.24	17.23	27.76
7	Base Dia (mm)	11.24	25.13	20.43	18.740	18.928	21.19	21.30	99.01	8.87	43.44
8	Middle Dia (mm)	6.45	13.23	10.99	3.043	3.194	15.88	16.27	95.27	3.51	31.92
9	Top Dia (mm)	3.14	6.77	5.02	0.620	0.687	15.68	16.51	90.25	1.54	30.69
10	Core Dia (mm)	9.76	20.54	16.65	7.913	8.178	16.90	17.18	96.76	5.70	34.24
11	Dry Fibre wt. (g)	7.85	19.98	16.53	7.269	7.491	16.31	16.55	97.04	5.47	33.09
12	Dry Stick wt. (g)	17.59	56.48	46.34	63.387	65.772	17.18	17.50	96.37	16.10	34.74

Table 5. Number, percent and name of genotypes in different cluster.

Cluster number	Number of varieties	Percent (%)	Name of Accessions
I	6	14.29	Ac 01, Ac 04, Ac 16, Ac 29, Ac 31 and Ac 37
II	10	23.81	Ac 02, Ac 06, Ac 08, Ac 09, Ac 14, Ac 20, Ac 24, Ac 26, Ac 39 and Ac 41
III	9	21.43	Ac 03, Ac 10, Ac 11, Ac 21, Ac 27, Ac 28, Ac 33, Ac 38 and Ac 42
IV	5	11.9	Ac 05, Ac 07, Ac 13, Ac 17 and Ac 40
V	12	28.57	Ac 12, Ac 15, Ac 18, Ac 19, Ac 22, Ac 23, Ac 25, Ac 30, Ac 32, Ac 34, Ac 35 and Ac 36

belonged to cluster-III. In the fourth group of divergent clusters consisting of cluster-IV, five genotypes namely serial no. of Ac 05, Ac 07, Ac 13, Ac 17 and Ac 40 belonged to cluster-IV. In the fifth group of divergent clusters consisting of cluster-V, twelve genotypes namely serial no. of Ac 12, Ac 15, Ac 18, Ac 19, Ac 22, Ac 23, Ac 25, Ac 30, Ac 32, Ac 34, Ac 35 and Ac 36 belonged to cluster-V. The diversity in the present materials was also supported by the appreciable amount of variation among cluster means for different characters (Table 6). Cluster V showed highest mean for plant height (3.38 m), Base diameter (24.44 mm), dry stick weight (52.78 g) and dry fibre weight (18.69 g).

Table 6. Cluster mean for twelve yield and yield characters of *C. capsularis.*

Characters	I	II	III	IV	V
Tech ht (m)	2.39	2.81	2.97	3.13	3.38
Leaf Angl (dg)	52.17	48.50	52.89	46.60	50.42
Leaf Lnth (cm)	12.68	12.98	14.10	14.57	15.81
Leaf Width (cm)	5.49	5.81	6.47	6.46	7.26
PetiolLnth (cm)	4.34	5.36	5.50	6.55	7.18
Node No.	51.83	54.80	59.11	69.40	72.42
Base Dia (mm)	13.16	18.72	19.97	23.78	24.44
Middle Dia (mm)	8.15	9.69	11.33	12.35	12.66
Top Dia (mm)	4.05	4.63	4.79	5.07	5.99
Core Dia (mm)	12.54	14.52	17.26	18.35	19.31
Dry Fibre wt. (g)	11.24	15.83	16.93	18.40	18.69
Dry Stick wt. (g)	30.94	44.39	47.26	51.63	52.78

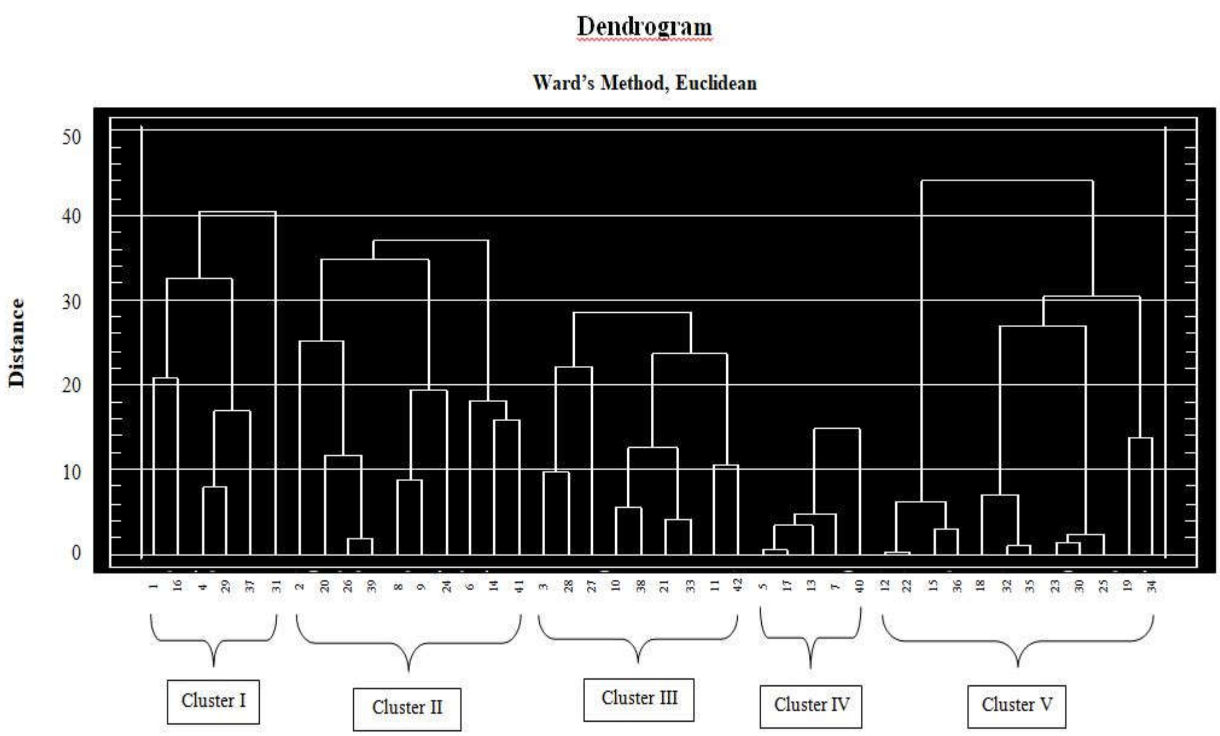

Figure 1. Dendogram of 42 deshi jute genotypes.

Conclusion

The experiment demonstrates that the studied genotypes were highly variable for all of the morpho-agronomic traits and the accessions of *C. capsularis* 628, 633, 635 and 646 performed better in respect of major yield contributing traits than the controls CVE-3, CVL-1, BJC-7370 and BJC-83. Hence it can be concluded that these promising accessions may be used in a hybridization programme, to enhance fibre yield of deshi jute.

References

Annual Research Report (2016). Bangladesh Jute Research Institute. Manik Mia Avenue, Dhaka-1207.

Basu A, Ghosh M, Meyer R, Powell W, Basak SL, Sen SK (2004). Analysis of genetic diversity in cultivated jute determined by means of SSR markers and AFLP profiling. *Crop Science*, 44: 678-685.

BBS (2010). Statistical Yearbook of Bangladesh. Bangladesh Bureau of Statistics. Ministry of Planning and Statistics Division, Govt. of People's Republic of Bangladesh, Dhaka. Website: http://www.bbs.gov.bd

Choudhuri SD, Mia AJ (1962). Species crosses in the genus *Corchorus* (jute plant). *Euphytica*, 11: 61-64.

Edmonds JM (1990). Herbarium survey of African *Corchorus* species. Systematic and Ecogeographic Studies on Crop Genepools 4. *International Board for Plant Genetic Resources*.

Ghosh M, Saha T, Nayak P, Sen SK (2002). Genetic transformation by particle bombardment of cultivated jute, *Corchorus capsularis* L. *Plant cell reports*, 20: 936-942.

Haque S, Begum S, Sarker RH, Khan H (2007). Determining genetic diversity of some jute varieties and accessions using RAPD markers. *Plant Tissue Culture and Biotechnology*, 14: 143-148.

Hossain MB, Haque S, Khan H (2002). DNA Fingerprinting of jute germplasm by RAPD. *Journal of Biochemistry and Molecular Biology*, 35: 414- 419.

Hossen M, Ali MS, Begum M, Khatton A, Halim A (2008). Study on high yield of quality jute seed production for diversified uses. *Journal of Innovation and Developmental Strategy*, 2: 71-73.

Islam AS, Rashid A (1960) First successful hybrid between the two jute yielding species, *Corchorus olitorius L.* (Tossa) × *C. capsularis* L. (White). Nature, 185: 258-259.

Islam MA, Haque MA, Sardar MA (2002). Biology and Parasitism of *Apanteles obliquae* Wilk. (Hymenoptera:Braconidae) on Jute Hairy Caterpillar, *Spilarctia obliqua* (Walk.). *Bangladesh Journal of Entomology*, 13: 12-21.

Islam MA, Ando T (2012). Knowledge and Practice of Pheromone Technologies: A case Study of a Representative District in Bangladesh. *Academic Research International*, 2(2): 55-61.

Islam MA (2012). Pheromone Use for Insect Control: Present Status and Prospect in Bangladesh. *International Journal of Agricultural Research, Innovation and Technology*, 2 (1): 47-55.

Kundu BC (1951). Origin of jute. Indian J Genet Pl Br. 11:95- 99 842 Laurentin H (2009) Data analysis for molecular characterization of plant genetic resources. *Genetic Resources and Crop Evolution*, 56: 277-292.

Mir RR, Rustgi S, Sharma S, Singh R, Goyal A, Kumar J, Gaur A, Tyagi AK, Khan H, Sinha MK, Balyan HS, Gupta PK (2008). A preliminary genetic analysis of fiber traits and the use of new genomic SSRs for genetic diversity in jute. *Euphytica*, 161: 413-427.

Mohiuddin G, Rashid M, Rahman M, Hasib SA, Razzaque A (2005). Biopulping of whole jute plant in soda-anthraqunion and kraft processes. *TAPPI J.*, 4: 23-27

Patel GI, Datta RM (1960) Interspecific hybridization between *Corchorus olitorius* and *C. capsularis* and the cytogenetical basis of incompatibility between them. *Euphytica*, 9: 89-110.

Roy A, Bandyopadhyay A, Mahaptra AK, Ghosh SK, Singh NK, Bansal KC, Koundal KR, Mohapatra T (2006). Evaluation of genetic diversity in jute (*Corchorous* species.) using STMS, ISSR and RAPD markers. *Plant Breeding*, 125: 292-297.

Roy SK,Chakraborty, Hijam HM, Mondal HA, Surje DT, Roy A, Mondal A, Pal S, Kundu A. Das S, Sarkar P, Kheroar S, Chakraborty G, Mitra S (2018). Studies on genetic variability and screening for fibre yield components and biotic stress factors in tossa jute (*Corchorus olitorius L.*) germplasm under Terai region of West Bengal. *Electronic Journal of Plant Breeding*, 9 (2): 409-423.

Roy A, Chakraborty G, Roy SK, Mitra S, Sarkar SK (2015). Exploiting plant growth promoting microbes and biopesticides for ecofriendly and cost-effective biotic stress management of Olitorius Jute in Terai Region of West Bengal. *Indian Journal of Natural Fibres*, 1(2): 203-11.

Saha T, Majumdar S, Banerjee NS, Sen SK (2001). Development of interspecific somatic hybrid cell lines in cultivated jute and their early characterization using jute chloroplast RFLP marker. *Plant Breeding*, 120: 439-444.

Saunders M (2001). Recovery plan for the endangered native jute species, *Corchorus cunninghamii* F. Muell in Queensland (2001-2006). Natural Heritage Trust, Australia, 221-232.

Sawarkar A, Yumnam S, Patil SG, Mukherjee S (2014). Correlation and path coefficient analysis of yield and its attributing traits in tossa jute (*Corchorus olitorius L.*). *The Bioscan*, 9(2): 883-87.