J. Sher-e-Bangla Agric. Univ., 4(1):18-23, January 2010 ISSN 1997-6038

PERFORMANCE OF SOME INDIGENOUS GERMPLASMS OF TOSSA JUTE (*Corchorus olitorius* L.)

M. M. Islam[1], M. M. Rahman[2], A. S. M. Yahiya[3], A. Miah[4] and M. Al-Mamun[5]

ABSTRACT

Forty one indigenous genotypes of tossa jute (*Corchorus olitorius* L.) including three cultivated varieties were evaluated for comparative mean performance against nine different morphological characters and growth rate at the Central Jute Agricultural Experiment Station, Jagir, Manikganj of Bangladesh Jute Research Institute (BJRI) during April to September 2007. Data were recorded on fibre yield and yield contributing characters viz. plant height, base diameter, number of nodes per plant, internode length, leaf area, green weight with leaves per plant, green weight without leaves per plant and stick weight per plant. Significant variation was observed among the genotypes tested in respect of all the characters except internode length. The genotypes G1 (Acc. No. 1232), G13 (Acc. No. 2541) and G21 (Acc. No. 2717) gave higher fibre yield (8.59g, 8.53g and 8.20g, respectively) compared with the check varieties O-9897, OM-1 and O-72 indicating the possibility of using them in future breeding programs. The genotypes G41 (Acc. No. 3907), G1 (Acc. No. 1232) and G32 (Acc. No. 3413) showed considerably higher growth rate (35.46%, 19.73% and 19.09%, respectively) between 90 to 105 days of emergence, which indicated that selection of fast growing genotypes between 90 to 105 days of emergence would be more effective and judicious.

Key words: Mean performance, growth rate, indigenous germplasm, tossa jute.

INTRODUCTION

Jute is an important cash crop in Bangladesh. It singly earns foreign exchange contributing approximately between 6-7% to our national economy (BBS, 2004). In the year 2004, about 965 thousand acres of land were cultivated by jute and the production was around 732 thousand metric tons (BBS, 2005) and its 70-75% was tossa jute (*Corchorus olitorius*). Market price of *C. olitorius* fibre is higher for its better quality than that of *C. capsularis*. As a result, *C. olitorius* jute cultivation is increasing day by day and has a great demand to the farmers. It appears from the recent records that in Bangladesh, not only the area under jute is declining, the crop is also being pushed more and more back to the marginal lands. As a result, jute yield in this country is not satisfactory. Yield per unit area has not been increased remarkably mainly for the availability of only a limited number of jute varieties having narrow genetic bases and lack of suitable and superior germplasm in the crop species. In order to improve yield potentiality and productivity of this crop species, constant flow of new genetic material is required, as well as superior parents with high breeding values are needed. Bangladesh Jute Research Institute has got about 1540 germplasm of tossa jute (*C. olitorius*) of which 986 germplasms are indigenous in origin and the rests are exotic materials. These indigenous materials have wider gene pool with different morpho-agronomic characteristics related to higher fibre yield. Therefore, the present study was undertaken to screen out and to isolate desirable genotypes on the basis of their mean performances of some morpho-agronomic characteristics and growth rate, which can be used successfully in crossing program for the development of new variety of this crop species.

MATERIALS AND METHODS

The experiment comprised of 41 germplasm accessions of tossa jute of indigenous origin including 3 standard check varieties, namely var. O-9897, var. OM-1 and var. O-72 (Table 1). Genetically pure

[1&2]Scientific Officer and Senior Scientific Officer, respectively, Breeding Division, Bangladesh Jute Research Institute (BJRI), Dhaka-1207, [3]Scientific Officer, Genetic Resources and Seed Division, BJRI, Dhaka-1207, [4]Scientific Officer, Farm Management Unit, BJRI, Dhaka-1207, [5]Scientific Officer, Jute Farming Systems Division, BJRI, Dhaka-1207, Bangladesh.

and physically healthy seeds of these genotypes were collected from the Gene Bank of BJRI, Dhaka and were raised in a randomized complete block design (RCBD) with three replications. The experiment was conducted at Central Jute Agricultural Experiment Station of Bangladesh Jute Research Institute (BJRI), Jagir, Manikganj during the period from April to September, 2007. Unit plot had a single row of 3 m length. Space between rows was 30 cm and block to block distance was 1 m. Standard agronomic practices were maintained to raise healthy crop. Plant height of 10 randomly selected plants of each genotype from each replication was recorded at 75 days, 90 days, 105 days and 120 days, to measure their growth rate. After 120 days the plants were harvested and data on plant height, base diameter, number of nodes per plant, leaf area, green weight with leaves per plant, green weight without leaves per plant, stick weight per plant and fibre weight per plant were recorded from 10 randomly selected plants of each genotype from each replication. Data were statistically analyzed according to Panse and Shukhatme (1978), Steel and Torrie (1980) and Johnson *et al.* (1955).

Table 1. Origin of the selected indigenous genotypes of tossa jute

Accession No.	Place of collection	Accession No.	Place of collection
1232(G1)	Chittagong	3053(G23)	Meherpur
1291(G2)	Sylhet	3060(G24)	Chuadanga
1880(G3)	Tangail	3089(G25)	Kushtia
1896(G4)	Manikganj	3172(G26)	Comilla
1941(G5)	Kurigram	3189(G27)	Chittagong
2099(G6)	Shirajganj	3263(G28)	Jamalpur
2174(G7)	Panchagar	3277(G29)	Dhaka
2196(G8)	Nawgoan	3297(G30)	Dhaka
2335(G9)	Pabna	3306(G31)	Maulovibazar
2345(G10)	Natore	3413(G32)	Rajbari
2478(G11)	Narail	3432(G33)	Faridpur
2524(G12)	Khulna	3433(G34)	Faridpur
2541(G13)	Bagerhat	3483(G35)	Mymensingh
2554(G14)	Magura	3541(G36)	Madaripur
2563(G15)	Magura	3802(G37)	Chittagong
2580(G16)	Satkhira	3856(G38)	Chittagong
2585(G17)	Jessore	3888(G39)	Khagrachari
2586(G18)	Barisal	3894(G40)	Bandarban
2602(G19)	Pirojpur	3907(G41)	B.baria
2691(G20)	Bagerhat	O-9897(G42)	Cultivar
2717(G21)	Jhenidah	OM-1(G43)	Cultivar
2744(G22)	Pirojpur	O-72(G44)	Cultivar

RESULTS AND DISCUSSION

The analysis of variance showed highly significant differences among the genotypes for all the characters studied except internode length (Table 2). Significant differences among the genotypes for these characters were also reported by Chaudhury *et al.* (1985), Islam *et al.* (2002), Islam and Ahmed (2003), Akter *et al.* (2005).

Table 2. Mean sum of squares (MS) for 9 morphological and agronomical characters of different genotypes of tossa jute

Characters	Source of variation		
	Replication	Genotype	Error
Plant height (m)	0.079 ns	0.063**	0.026
Base diameter (mm)	5.741**	2.661**	0.748
Number of nodes per plant	32.205 ns	274.779**	16.577
Internode length (cm)	3.883**	0.166 ns	0.175
Leaf area (cm^2)	36.598*	46.951**	8.590
Green weight with leaves per plant (g)	7.403 ns	440.601**	13.410
Green weight without leaves per plant (g)	63.681**	302.631**	10.882
Stick weight per plant (g)	1.272 ns	27.077**	0.665
Fibre weight per plant (g)	0.115 ns	3.512**	0.165
Degrees of freedom	2	43	86

* and ** significant at 5% and 1% level, ns= not significant

Mean performance

The results of nine morphological and agronomical characters are presented in Table 3. The characters under study varied significantly among the genotypes except internode length. The differences among the genotypes for internode length were non significant.

Significant differences were observed among the genotypes for plant height which ranged from 2.27m (G2) to 2.95 m (G22). Genotypes viz. G3 (2.70m), G5 (2.72m), G7 (2.72m), G9 (2.72m), G10 (2.72m), G21 (2.72m), G28 (2.76m), G 43 (2.72m) and G 44 (2.71) were statistically similar for plant height (Table 3). The highest and lowest base diameter were observed in G22 (15.93 mm) and G4, (11.67mm), respectively. Genotypes viz. G6 (13.69 mm), G13 (13.64 mm), G30 (13.54 mm) and G44 (13.70 mm) were statistically similar for base diameter. The maximum nodes per plant was found in G21 and G34 (83.0) genotypes and minimum nodes per plant was found in G1 (38.67) genotype. Genotypes viz. G17, G18, G22, G29 (74.33) and G23 (74.00) were found statistically similar for nodes per plant. The maximum leaf area (43.46 sq cm) was found in G14 and the minimum leaf area (24.17 sq. cm) was observed in G4 genotype. Genotypes viz. G10 (35.73 sq. cm), G26 (35.61 sq. cm) were statistically similar for leaf area. Green weight with leaves ranged from 36.85 g (G27) to 90.79 g (G29) with a mean value of 61.27 g. The genotypes viz. G7 (58.36 g), G9 (58.17 g), G2 (57.51 g), G25 (58.0 g) and G32 (58.19) were statistically similar for this trait. The genotypes varied significantly for green weight without leaves per plant which ranged from 24.20 g (G27) to 70.13 g (G 29), with a mean value of 44.29 g. The maximum and minimum stick weight per plant were observed in genotypes G29 (23.54 g) and G27 (7.76 g), respectively (Table 3). The genotypes viz. G 18 (13.91 g), G19 (13.99g) and G26 (13.91g) were statistically similar and very close to mean value (13.84g). Fibre yield (g/plant) ranged from 3.58 g (G27) to 8.59 g (G1) with a mean value of 6.02 g. The genotypes viz. G6 (5.52 g), G17 (5.79g), G19 (5.59 g), G25 (5.68 g), G26 (5.52 g), G 28 (5.67 g), G 30 (5.75 g), G 32 (5.55 g), G 37 (5.65 g) and G42 (5.60 g) were statistically similar in respect of fibre weight. The genotypes G1 (8.59 g), G13 (8.53 g) and G21 (8.20 g) gave higher fibre yield compared with the check varieties O-9897, OM-1 and O-72.

Table 3. Mean performance of morphological and agronomical characters of different indigenous genotypes of tossa jute

Genotypes	PH	BD	NP	IL	LA	GWW	GWO	SW	FW
G1(1232)	2.38 h-l	13.05 j-p	38.67 q	4.97	24.65 k	73.13 cd	46.06 g-i	15.01 e-h	8.59 a
G2(1291)	2.27 l	12.31 op	40.67 q	4.29	34.43 b-g	57.51 h-l	39.50 k-p	9.93 s-t	5.40 i-k
G3(1880)	2.70 a-f	14.36 c-k	60.00 no	4.44	34.56 b-g	67.11 d-f	51.75 c-l	16.19 c-e	6.90 de
G4(1896)	2.51 f-i	11.67 p	54.33 op	4.56	24.17 k	54.73 j-n	44.02 h-l	12.38 k-o	5.93 g-i
G5(1941)	2.72 a-f	13.77 d-n	66.33 h-n	4.17	29.43 g-k	66.28 d-g	54.55 b-d	16.69 cd	6.73 ef
G6(2099)	2.77 a-e	13.69 d-o	71.67 c-j	4.29	36.52 b-e	63.91 e-i	49.53 g-j	14.07 hi	5.68 h-k
G7(2174)	2.72 a-f	12.51 n-p	65.67 j-n	4.04	26.63 i-k	58.36 h-l	45.12 c-e	12.22 k-p	6.17 f-h
G8(2196)	2.78 a-e	13.38 g-o	72.00 c-j	4.17	32.68 c-h	69.24 de	52.38 g-i	17.15 c	6.67 ef
G9(2335)	2.72 a-f	13.42 e-o	68.33 g-m	4.02	32.65 c-h	58.17 h-l	45.83 q-i	12.20 k-p	5.51 i-k
G10(2345)	2.72 a-f	12.83 lm	66.00 i-n	4.08	35.73 b-f	46.24 o-q	33.05 q-s	11.13 o-s	5.66 h-k
G11(2478)	2.88 a-c	13.39 f-o	77.33 c-p	4.54	34.89 b-g	61.18 f-k	45.90 g-i	14.17 g-i	6.64 ef
G12(2524)	2.84 a-e	13.33 g-o	76.33 b-e	4.51	36.91 b-e	80.23 bc	56.92 bc	16.60 cd	6.70 ef
G13(2541)	2.86 a-d	13.64 d-o	76.67 a-d	4.39	31.23 e-j	89.07 a	68.23 a	20.20 b	8.53 a
G14(2554)	2.88 a-c	13.46 e-o	71.67 c-j	4.62	43.46 a	67.89 d-f	48.67 e-h	12.97 i-m	7.69 bc
G15(2563)	2.82 a-e	13.01 k-p	70.00 e-l	4.42	32.07 d-i	66.22 d-g	45.24 g-j	12.47 k-m	5.15 k-m
G16(2580)	2.91 ab	13.96 c-m	71.00 d-k	4.27	37.45 b-d	69.67 de	59.36 b	16.38 cd	7.06 c-f
G17(2585)	2.80 a-e	13.18 h-o	74.33 b-g	4.45	32.42 d-h	48.72 m-q	35.04 o-s	11.89 l-q	5.79 h-k
G18(2586)	2.84 a-e	12.77 m-p	74.33 b-g	4.36	35.79 b-f	68.15 d-f	42.68 i-m	13.91 h-j	5.97 g-i
G19(2602)	2.80 a-e	13.30 g-o	72.33 c-i	4.05	29.26 g-k	45.26 pq	30.24 s	13.99 h-j	5.59 h-k
G20(2691)	2.68 b-g	13.97 c-m	68.00 gh	4.25	28.41 h-k	78.81 bc	50.00 d-g	15.40 d-g	7.20 c-e
G21(2717)	2.72 a-f	14.70 a-g	83.00 a	4.45	35.90 b-f	80.00 bc	58.84 b	20.97 b	8.20 ab
G22(2744)	2.95 a	15.93 a	74.33 b-g	4.21	35.53 b-f	58.61 g-l	39.28 l-p	15.74 d-f	6.54 e-g
G23(3053)	2.83 a-e	15.26 a-c	74.00 b-g	4.62	38.56 a-c	65.21 e-h	46.71 f-i	14.81 f-h	7.01 de
G24(3060)	2.87 a-c	14.90 a-d	78.00 a-c	4.28	32.99 c-h	62.41 e-j	40.46 j-n	14.84 f-h	5.81 h-j
G25(3089)	2.80 a-e	14.44 b-j	78.00 a-c	4.56	37.53 b-d	58.00 h-l	36.79 n-p	12.67 j-n	5.68 h-k
G26(3172)	2.85 a-e	14.31 c-k	76.33 b-e	4.43	35.61 b-f	52.66 l-p	39.93 j-p	13.91 h-j	5.52 h-k
G27(3189)	2.61 d-g	14.41 b-k	62.33 mn	4.22	35.33 b-f	36.85 r	24.20 t	7.76 u	3.58 o
G28(3263)	2.76 a-f	14.48 b-h	71.67 c-j	4.41	37.09 b-e	52.37 l-p	36.69 n-r	13.13 i-l	5.67 h-k
G29(3277)	2.86 a-d	15.35 a-c	74.33 b-g	4.35	35.36 b-f	90.79 a	70.13 a	23.54 a	7.46 cd
G30(3297)	2.82 a-e	13.54 d-o	75.00 b-f	3.97	34.83 b-g	54.67 j-n	38.45 m-p	14.10 g-i	5.75 h-k
G31(3306)	2.59 e-h	14.22 c-l	62.00 mn	4.04	36.26 b-e	56.50 i-m	42.70 i-m	10.42 r-t	4.25 n
G32(3413)	2.84 a-e	14.79 a-f	73.33 c-g	4.69	34.05 b-h	58.19 h-l	40.35 j-o	14.17 g-i	5.55 h-k
G33(3432)	2.67 b-g	12.74 m-p	65.00 k-n	4.54	32.33 d-h	65.00 e-h	42.96 i-m	11.72 m-r	4.52 mn
G34(3433)	2.89 a-c	15.79 ab	83.00 a	4.43	37.10 b-e	55.96 j-m	37.77 m-r	13.26 i-k	5.84 h-j
G35(3483)	2.91 ab	14.45 b-i	80.00 ab	4.60	34.53 b-g	51.48 l-p	36.30 n-r	12.88 i-n	5.39 i-k
G36(3541)	2.91 ab	14.70 a-g	77.33 a-d	4.69	36.67 b-e	46.70 o-q	34.72 p-s	10.77 q-s	4.70 l-n
G37(3802)	2.83 a-e	14.12 c-m	73.33 c-g	4.37	32.38 d-h	51.91 l-p	42.51 i-m	12.24 k-p	5.65 h-k
G38(3856)	2.64 c-g	13.06 i-p	63.00 mn	4.01	25.71 jk	43.07 qr	29.92 s	9.38 t	4.43 n
G39(3888)	2.44 g-i	12.39 n-p	48.33 p	4.07	29.29 g-k	47.07 n-q	32.50 rs	11.59 n-r	5.22 j-l
G40(3894)	2.77 a-e	14.46 b-i	69.67 f-l	4.02	33.01 c-h	55.60 j-m	44.79 g-k	13.35 i-k	5.40 i-k
G41(3907)	2.64 c-g	14.50 b-h	72.67 c-h	4.23	30.25 f-j	84.68 ab	66.57 a	17.22 c	6.78 ef
G42(O-9897)	2.70 a-g	14.03 c-m	62.33 mn	4.09	39.63 ab	60.94 f-k	45.02 g-j	12.05 k-q	5.60 h-k
G43(OM-1)	2.72 a-f	14.81 a-e	64.33 l-n	4.12	35.12 b-g	53.35 k-o	38.10 m-q	12.53 k-n	5.34 i-l
G44(O-72)	2.71 a-f	13.70 d-o	68.00 g-m	3.93	33.94 b-h	64.09 e-l	38.79 l-p	11.02p-s	5.36 i-k
Mean	**2.75**	**13.87**	**69.20**	**4.32**	**33.69**	**61.27**	**44.29**	**13.84**	**6.02**
Range	**2.27-2.95**	**11.67-15.93**	**38.67-83.00**	**3.93-4.97**	**24.17-43.46**	**36.85-90.79**	**24.20-70.13**	**7.76-23.54**	**3.58-8.59**
CV%	**5.88**	**6.24**	**5.88**	**9.69**	**13.70**	**9.98**	**7.45**	**9.89**	**6.75**
$LSD_{(0.05)}$	**0.262**	**1.404**	**6.609**	**NS**	**4.757**	**7.853**	**5.354**	**1.324**	**0.659**

The means followed by common letter(s) are statistically similar with each other at 5% level of significance.
PH= Plant height (m), BD = Base diameter (mm), NP = Number of nodes/plant, IL= Internode length (cm), LA = Leaf area (sq. cm), GWW =Green weight with leaves/plant (g), GWO = Green weight without leaves/plant (g), SW =Stick weight/plant (g) and FW = Fibre weight/plant.

Growth rate

Plant height of different genotypes was recorded at 75 days, 90 days, 105 days and 120 days (15 days intervals) and their growth rate was measured as percent of increase in plant height between 75-90 days, 90-105 days and 105-120 days, respectively (Table 4).

Table 4. Growth rate of different indigenous genotypes of tossa jute at 75 days, 90 days, 105 days and 120 days (15 days intervals)

Genotypes	Plant height (m) at different days				% increase at different intervals		
	75 days	90 days	105 days	120 days	(75-90) days	(90-105) days	(105-120) days
G1(1232)	1.76	1.86	2.23	2.33	5.70	19.73	4.49
G2(1291)	1.78	1.87	2.19	2.29	5.06	17.36	4.57
G3(1880)	2.12	2.25	2.38	2.52	6.51	5.51	6.04
G4(1896)	2.00	2.12	2.45	2.58	5.83	15.61	5.45
G5(1941)	2.14	2.33	2.59	2.67	9.36	11.02	3.22
G6(2099)	2.16	2.23	2.47	2.56	2.97	11.08	3.64
G7(2174)	2.13	2.31	2.62	2.70	9.00	13.26	2.93
G8(2196)	2.14	2.27	2.53	2.65	6.09	11.30	4.88
G9(2335)	2.24	2.36	2.82	2.91	5.68	19.19	3.43
G10(2345)	2.18	2.26	2.53	2.63	3.68	12.09	3.69
G11(2478)	2.37	2.47	2.83	2.92	4.41	14.44	3.18
G12(2524)	2.26	2.34	2.57	2.67	3.55	10.00	3.76
G13(2541)	2.20	2.37	2.71	2.77	7.77	14.33	2.21
G14(2554)	2.31	2.42	2.73	2.82	4.77	12.68	3.30
G15(2563)	2.23	2.33	2.62	2.72	4.49	12.76	3.69
G16(2580)	2.34	2.43	2.68	2.79	3.71	10.44	3.98
G17(2585)	2.09	2.24	2.52	2.68	7.24	12.50	6.35
G18(2586)	2.38	2.47	2.79	2.87	3.93	12.82	2.87
G19(2602)	2.12	2.33	2.48	2.64	9.92	6.47	6.73
G20(2691)	2.39	2.47	2.85	2.95	3.63	15.37	3.51
G21(2717)	2.49	2.61	2.86	3.00	4.96	9.71	4.89
G22(2744)	2.58	2.70	2.98	3.09	4.53	10.63	3.57
G23(3053)	2.55	2.66	2.97	3.06	4.45	11.52	3.14
G24(3060)	2.51	2.59	2.96	3.07	3.18	14.01	3.73
G25(3089)	2.50	2.61	2.93	3.04	4.41	12.28	3.99
G26(3172)	2.50	2.60	2.92	3.03	4.17	12.29	3.76
G27(3189)	1.86	2.01	2.10	2.31	8.55	4.33	10.22
G28(3263)	2.35	2.42	2.70	2.85	2.86	11.71	5.43
G29(3277)	2.42	2.55	2.83	2.94	5.12	11.00	3.89
G30(3297)	2.31	2.38	2.64	2.75	3.03	10.77	4.29
G31(3306)	2.12	2.22	2.48	2.60	4.87	11.86	4.83
G32(3413)	2.57	2.64	3.14	3.23	2.74	19.09	2.86
G33(3432)	2.20	2.31	2.62	2.89	5.00	13.27	10.45
G34(3433)	2.55	2.67	3.17	3.30	4.99	18.71	3.89
G35(3483)	2.46	2.55	2.96	3.05	3.66	16.06	2.82
G36(3541)	2.40	2.44	2.77	2.87	1.69	13.82	3.49
G37(3802)	2.36	2.48	2.82	2.97	5.25	13.71	5.32
G38(3856)	2.09	2.14	2.50	2.59	2.40	16.87	5.27
G39(3888)	1.82	1.98	2.18	2.52	9.03	9.75	15.93
G40(3894)	2.11	2.30	2.54	2.65	9.37	10.58	4.06
G41(3907)	1.56	1.64	2.22	2.56	5.20	35.46	15.49
G42(O-9897)	2.11	2.27	2.63	2.78	7.98	15.56	5.84
G43(OM-1)	2.17	2.24	2.62	2.73	3.25	17.29	4.07
G44(O-72)	2.16	2.20	2.54	2.70	2.02	15.44	6.31
Mean	**2.23**	**2.34**	**2.65**	**2.78**	**5.14**	**13.49**	**4.99**
SD	**0.23**	**0.23**	**0.25**	**0.23**	**2.14**	**4.80**	**2.89**
CV%	**9.58**	**10.65**	**5.71**	**5.43**	**26.95**	**12.82**	**21.24**

Mean plant height of different indigenous genotypes at different stage of growth were found 2.23 m (75 days), 2.34m (90 days), 2.65m (105 days) and 2.78m (120 days) (Table 4). Mean growth rate of different genotypes at different intervals were 5.14% (75-90 days), 13.49% (90-105 days) and 4.99% (105-120 days). All the genotypes except G3 (5.51%), G19 (6.47%) and G27 (4.33%) showed maximum growth rate between 90 to 105 days. The genotypes viz. G1 (19.73%), G2 (17.36%), G32 (19.09%), G34 (18.71%) and G41 (35.46%) showed considerably higher growth rate between 90 to 105 days.

Results of the present study indicated that the genotypes G1 (Acc. No. 1232), G13 (Acc. No. 2541) and G21 (Acc. No. 2717) showed better performance in respect of fibre yield and other yield contributing characters. Therefore these three genotypes might be used as superior parents in future breeding programs for developing high yielding jute variety. On the other hand, growth rate study indicated that almost all the genotypes achieved maximum growth (i.e. plant height) between 90 to 105 days of emergence. Therefore, selection would be effective during this time and plant breeders have no need to wait till harvest (120 days) period. This would considerably reduce time and labour for selecting quick growing genotypes. The genotypes G1 (Acc. No. 1232), G2 ((Acc. No. 1291)), G32 (Acc. No. 3413), G34 (Acc. No. 3433) and G41 (Acc. No. 3907) showed considerably higher growth rate between 90 to 105 days of emergence. So, these materials could be used in hybridization program as fast growing superior parents for developing tossa jute varieties with higher growth rate.

REFERENCES

Akter, N., Mian, M. A. K., Islam, M. M., Alim, M. A. and Islam, M. N. 2005. Estimation of genetic parameters, character association and path analysis in jute (*C. olitorius* L.) germplasm. *Bangladesh J. Pl. Breed. Genet.* 18 (1): 35-38.

BBS, 2004. Statistical Year Book of Bangladesh. Bangladesh Bureau of Statistics, Planning Ministry, Dhaka.

BBS, 2005. Statistical Year Book of Bangladesh. Bangladesh Bureau of Statistics, Planning Ministry, Dhaka.

Chaudhury, S. K., Roy, M. K. G. and Sinha, M. K. 1985. Genetic variability and heritability studies in tossa jute germplasm. *Jute Development J.* 5 (1): 36-37.

Islam, M. S. and Ahmed, S. 2003. Genetic variability and character association in *Corchorus olitorius* L. *Bangladesh J. Life Sci.* 15 (2): 133-136.

Islam, M. S., Mian, M. A. K., Ahmed, S., Hossain, T. and Hossain, M. A. 2002. Variability in anatomical characters in relation to fibre content and quality in tossa jute (*C. olitorius* L.). *Bangladesh J. Pl. Breed. Genet.* 15 (2): 23-28.

Johnson, H. W., Robinson, H. F. and Comstock, R. E. 1955. Estimates of genetic and environmental variability in soybean. *Agron. J.* 47: 314-318.

Panse, V. G. and Sukhatme, P. V. 1978. Statistical method for agricultural workers. 3rd Edition. Indian council of Agricultural Research, New Delhi. pp. 258-268.

Steel, R. G. D. and Torrie, J. H. 1980. *Principles and procedures of statistics*. Mc Graw-Hill Book Co. Inc., New York.