

Selection of delayed flowering strain in tossa jute (*Corchorus olitorius* L.)

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Generally, the cultivated species of jute (*Corchorus capsularis* and *Corchorus olitorius*) are photoperiod sensitive with critical photoperiod of 12-12.5 hrs. which appears twice in a year i.e., during 22nd to 30th March and 15th to 25th September [1]. Sowing of jute is planned in such a way that it gets longer vegetative period to attain maximum height with the highest stem diameter before flowering as these influences fibre yield. Though a photoperiod insensitive strain (Germany) had been reported earlier [2], but could not be directly used for cultivation because of its very short vegetative period, which flowered in and around 35 days after sowing. Two reported lines [3] in *olitorius* jute were valued as photoperiod insensitive lines and, satisfactory performance with respect to fibre yield from early sowing could be achieved when sowing was delayed to 1st week of April. It is now being emphasized to shift the sowing of *olitorius* jute to 2nd to 3rd week of March so that land become vacant for rice transplantation by middle of July. Therefore, an attempt has been made to identify genotype that can be sown as early as middle of March to get higher fibre from *olitorius* jute.

The seed of photoperiod insensitive *olitorius* jute were collected from Abuja, Nigeria by officials of Bidhan Chandra Krishi Viswavidyalaya during 1970s. The initial material was a heterozygous population upon which selection had been practiced since then to attain homozygosity in the population. The seed from such selected population was sown in 1st April, 2005 and the variation in flowering dates in the population was noted

to be as early as 12th September to as late as 30th September. The late flowering individuals with standard plant height were initially chosen as probable sources of photoperiod insensitive strain with potentiality for high fibre yield. The seeds collected from these heterogeneous individuals were sown as separate families on 1st, 8th, 15th, 22nd and 29th March, 2006 along with two cultivated varieties (JRO 524 and JRO 7835) as checks and their flowering dates were noted. One families which later was designated as BC 50 showed photoin sensitivity with desirable economic yield. Late flowering was evident in BC 50 when sowing was advanced to as early as 15th March as against 29th March in rice of traditional varieties. The strain BC 50 showed simultaneous flowering after 26th September, which was below critical photoperiod, irrespective of staggered sowing of 7-day intervals starting from 15th to 29th March. The selected strain BC 50 was sown on 15th March and the check varieties JRO 524 and JRO 7835 were sown on 30th March in two different agroclimatic locations (Kalyani and Coochbehar) for three consecutive years, following Randomized Block Design with three replications maintaining 30 cm X 7 cm spacing to conduct fibre yield evaluation trial. Recommended doses of fertilizer (N, P, K) and standard intercultural operations were followed. The harvesting was done after 129 days of sowing. The day length (sunrise to sunset) at different locations were collected from meteorological data recorded by concerned departments in Kalyani and Coochbehar, Government of West Bengal.

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Table 1. Day length in hours (sunrise to sunset) on different dates of a year

Dates	Day length	Dates	Day length (hour)
1 st March	11.31	1 st September	13.32
8 th March	11.41	8 th September	11.22
15 th March	11.50	15 th September	12.13
22 nd March	12.00	22 nd September	12.03
29 th March	12.09	25 th September	12.00
30 th March	12.10	29 th September	11.55
		30 th September	11.54

The population raised from the introduced germplasm exhibited variation in flowering pattern, which could be due to genetic variation for the trait. The plants that flowered as late as 30th September were selected as those had less than 12h critical photoperiod since equinox occur on the 25th September. Early flowering resistance of BC 50 would facilitate early harvest for economic fibre yield and also provide scope

for timely rice transplantation. Normally jute crop is sown when day length is above critical day length (12h to 12.5h) otherwise, early flowering would occur affecting plant growth and eventual loss in fibre yield. The periodic sowing revealed that BC50 flowered after 17 to 25 days when sown on the 1st and 8th March but flowered after 179 to 195 days when sown afterwards i.e from 15th to 29th March. On the other hand, the check varieties flowered after 21 to 32 days when sown upto 22nd March, but flowered after 166 to 170 days for sowing on the 29th March (Table 2). It was also noted that BC50 flowered on the 30th September when the day length was 12.2 to 12.14 h which is the critical photoperiod.

The three year trial (Table 3) for the fibre yield in two locations revealed significant varietal differences in 2nd and 3rd year at Kalyani but it failed to show such effect in any of the year at Coochbehar. Significant effect due to year and genotype x year interaction were also found for Kalyani location (Table 4). The performance of BC50 with respect to fibre yield as compared to other two varieties was found to be superior. The result clearly indicated that sowing of the selected strain can be advanced to as early as 15th March in contrast to 29th

Table 2. Days to flowering vis-à-vis sowing in jute on different years

Date	Varieties					
	BC 50		JRO 524		JRO 7835	
	1 st Year	2 nd Year	1 st Year	2 nd Year	1 st Year	2 nd Year
1 st March	25	24	30	32	28	26
8 th March	18	17	28	29	26	27
15 th March	195	195	22	23	20	21
22 nd March	188	187	24	24	22	21
29 th March	181	179	168	166	167	168

Table 3. Fibre yield (q/ha) from yield trials over 3 years in two locations

Genotype	Kalyani			Coochbehar		
	1 st year 2007	2 nd year 2008	3 rd year 2009	1 st year 2007	2 nd year 2008	3 rd year 2009
BC 50 (15 th March)	29.48	26.80	28.90	18.98	34.30	27.06
JRO 524 (29 th March)	28.78	23.40	22.50	18.75	31.10	25.25
JRO 7835 (29 th March)	27.85	23.20	25.60	17.21	32.70	25.90
SEm±	-	0.947	1.290	-	-	-
CD at 5%	-	2.621	3.582	-	-	-

*Sowing date in parenthesis

March applicable for conventional standard varieties. The above result also pointed out the strain as photoperiod insensitive that can be fitted in rice-based cropping system. The strain also provides opportunity to extend sowing time as late as 1st June so that it can be harvested at 120 days i.e. before 30th September when it attained maximum vegetative period before flowering.

References

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