

### ALTERED FLOWERING PATTERN IN A LATE MUTANT OF JUTE

THE cultivated species of jute *Corchorus capsularis* and *C. olitorius* are typical short day plants<sup>1</sup> and hence cannot be grown for fibre in the off-season (*rabi*). Even in the normal growing season (*kharif*), early sowing leads to precocious flowering resulting in drastically reduced fibre yields. Varieties insensitive to the photoperiods and temperatures prevailing in the *rabi* season are not available in either species. The present note reports for the first time on a mutant which has a minimum vegetative growth period of 120 days both during *kharif* and *rabi* seasons. Its flowering response with different sowing dates, plant height, fibre yield and data on anatomical yield components are also included. Sowing during June to October was not done because heavy rains hamper germination under Trombay conditions.

One hundred and nine radiation induced mutants of *C. capsularis* var. JRC 412 were sown during the

first week of November 1977 to isolate late flowering tall types in the off-season. Three plants in the progeny of a tall mutant, (T-93, isolated after irradiation with 1 krad of fast neutrons) were late and flowered only after 120 days. Progeny of these were raised in the *kharif* (May sowing) 1978. The date of 50% flowering and height of 20-50 plants were recorded. Since the three mutant progenies were identical and had the same origin, they were treated as a single mutant in subsequent studies. The mutant and the parent were sown twice a month in November, December and February-May to study the flowering response in the two seasons.

Under our field conditions, the parent variety has been found to flower in 45-50 days during *rabi* and 85-90 days in *kharif*. The mutant flowered only after a vegetative period of 120 days during both the seasons. This phenomenon has been observed during two consecutive years in *kharif* and three years in *rabi* (Table I). Further, the following observations

TABLE I

Date of sowing, date of flowering, duration to flowering and plant height of parent and mutant

Date of sowing	Date of 50% flowering and number of days to 50% flowering		Plant height (cm)		
	Parent	Mutant	Parent	Mutant	
November	16, 1977	2- 1-1978 (47)	16- 3-1978 (120)	113 ± 1	191 ± 11
	8, 1978	25-12-1978 (47)	8- 3-1979 (120)	80 ± 2	183 ± 5
	23, 1978	15- 1-1979 (53)	30- 4-1979 (158)		
	11, 1979	5- 1-1980 (55)	13- 3-1980 (123)	115 ± 1	199 ± 4
December	8, 1978	8- 2-1979 (62)			(170)*
	22, 1978	23- 2-1979 (63)			(170)*
February	19, 1979	14- 5-1979 (84)	19- 9-1979 (212)	221 ± 4	328 ± 6
March	6, 1979	28- 5-1979 (83)	18- 9-1979 (196)	231 ± 6	299 ± 7
	22, 1979	21- 6-1979 (91)	19- 9-1979 (181)		
April	11, 1979	1- 8-1979 (112)	20- 9-1979 (162)	214 ± 9	284 ± 5
	26, 1979	9- 8-1979 (105)	17- 9-1979 (144)		
May	25, 1978	23- 8-1978 (90)	29- 9-1978 (120)	240 ± 5	331 ± 7
	10, 1979	4- 8-1979 (86)	18- 9-1979 (131)	227 ± 3	345 ± 2
	25, 1979	20- 8-1979 (87)	25- 9-1979 (120)		

Figures in parenthesis are number of days to flower.

Plant height data are taken at flowering, and its height from the base to the point of branching (technical height).

+ Plants did not flower till 170 days, but destroyed by mite attack.

were made with the different dates of sowing (Table I):  
1. The mutant had a vegetative growth period of at least 120 days irrespective of the time of sowing.  
2. When sown in February to May the mutant flowered only in September. As a result the vegetative period varied from 212 days for February sowing to 120 days for May sowing; while the parent flowered in 112–183 days depending on the time of sowing.

The prolonged vegetative period resulted in greater height of the mutant in all the sowings (Table I). The mutant attained a height of 180–200 cm in the *rabi* while the parent was only 80–115 cm (Fig. 1 and Table I). In the February–May sowings the difference in plant height was not commensurate with the difference in growth period (Table I) possibly due to the slower growth rate of the early sown material.



FIG. 1. (a) Parent and (b) Mutant (125 days after sowing in November 1979).

Transverse sections of the stem after 120 days of growth in *kharif* season showed significant increase in the major yield components namely number of wedges, layers and fibre bundles in the mutant

(Table II). The preliminary yield data show that the extended vegetative period of 30 days increased the fibre yield of the mutant significantly (Table II).

TABLE II  
Data on fibre yield and anatomical yield components of the parent and mutant

Characters	Parent	Mutant	Per cent increase over parent
Fibre yield of 20 plants (gm)	170.0	269.1	58.2
Number of wedges	86.6 ± 1.5	99.6 ± 2.0	15.0
Number of fibre layers	13.0 ± 0.3	17.4 ± 0.5	33.8
Number of bundles/wedge	42.7 ± 1.3	76.6 ± 3.5	79.4
Number of fibre cells/bundle	16.4 ± 1.2	17.5 ± 1.1	6.7
Length of fibre bundle (microns)	56.0 ± 2.0	62.4 ± 1.6	11.4
Breadth of fibre bundle (microns)	42.4 ± 1.6	44.0 ± 1.2	3.8

With early sowing of jute in the *kharif* season considerable amount of premature flowering has been reported in all the cultivated varieties<sup>2</sup>. Even the varieties selected for 'resistance to premature flowering' had 60–70% early flowering. Thus the problem of precocious flowering with early sowing remains unsolved. The photoinensitive mutant reported in the *capsularis* var. D 154 were dwarfs with very short vegetative periods, they were tested for only five sowing dates, hence their flowering response with a wide range of sowing dates is not known<sup>3</sup>. The mutant reported here is the only genotype which has a long vegetative period of at least 120 days even in the *rabi* season. The long duration of growth and relatively taller plant height (180–200 cm) indicate the possibility of its cultivation for fibre in this season also. One hundred thirty-six mutants of the other species *C. olitorius*<sup>1</sup> were earlier grown in the off-season at Trombay with the same objective. But a mutant similar to the present one of *C. capsularis* was not obtained.

Further studies on the genetics and flowering response to controlled conditions of light and temperature



are underway. The mutant has been named TCJ-5 (Trombay Capsularis Jute) and is being tested in the traditional jute growing tracks under the All India Coordinated Research Project.

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### SEXUAL DIMORPHISM IN *OPHISOPS JERDONI* BLYTH (LACERTILIA : LACERTIDAE)

In most lizards, males are generally larger in size and often display brilliant colours during the breeding activity to facilitate their recognition by the opposite sex. In most of the geckonids, agamids, diagamids and varanids, male members are additionally endowed with certain specialized glandular organs, the preanal organs, on their thighs to distinguish them from the females<sup>1-5</sup>. There is, however, no report of any evidence of sexual dimorphism in *Ophisops jerdoni*, a member off the family Lacertidae amongst the members of which there is neither any sex limited size difference nor restriction of preanal organs to the male sex only. The preanal organs as in other members of the family (except *Eremias aporosceles*) are to be found in both sexes of *O. jerdoni*<sup>2, 6</sup>.

The preanal organs in *O. jerdoni* lie embedded subdermally on the underside of the thighs and open to the outside through pores arranged in a file on the surface of each thigh (Fig. 1). Each pore leads into a single complex gland, itself lying in between 2 or more enlarged scales, termed as the femoral scales. An examination of 85 mature specimens of the lizard (51 males, size range 21-42 mm; 34 females, size range 20-45 mm) collected from dry and rocky banks of the river Tawi in Jammu (J. and K. State), revealed the presence of 6 to 11 pores on each side, 9 (range 7-11) and 7 (range 6-10) being the modal number of such pores in males and females respectively. Any variation from the modal number in the femoral pores is limited to the end of the pore series nearest to the knee and is not a consistent sex-limited difference. However, the number of scales separating the two most proximal pores of the two sides was different in the mature males and females. These intervening

scales, termed here as the *interfemoral scales* (IFS in Fig. 1) numbered only one in males, though, in a few cases (13%) even this solitary scale was found to be absent.

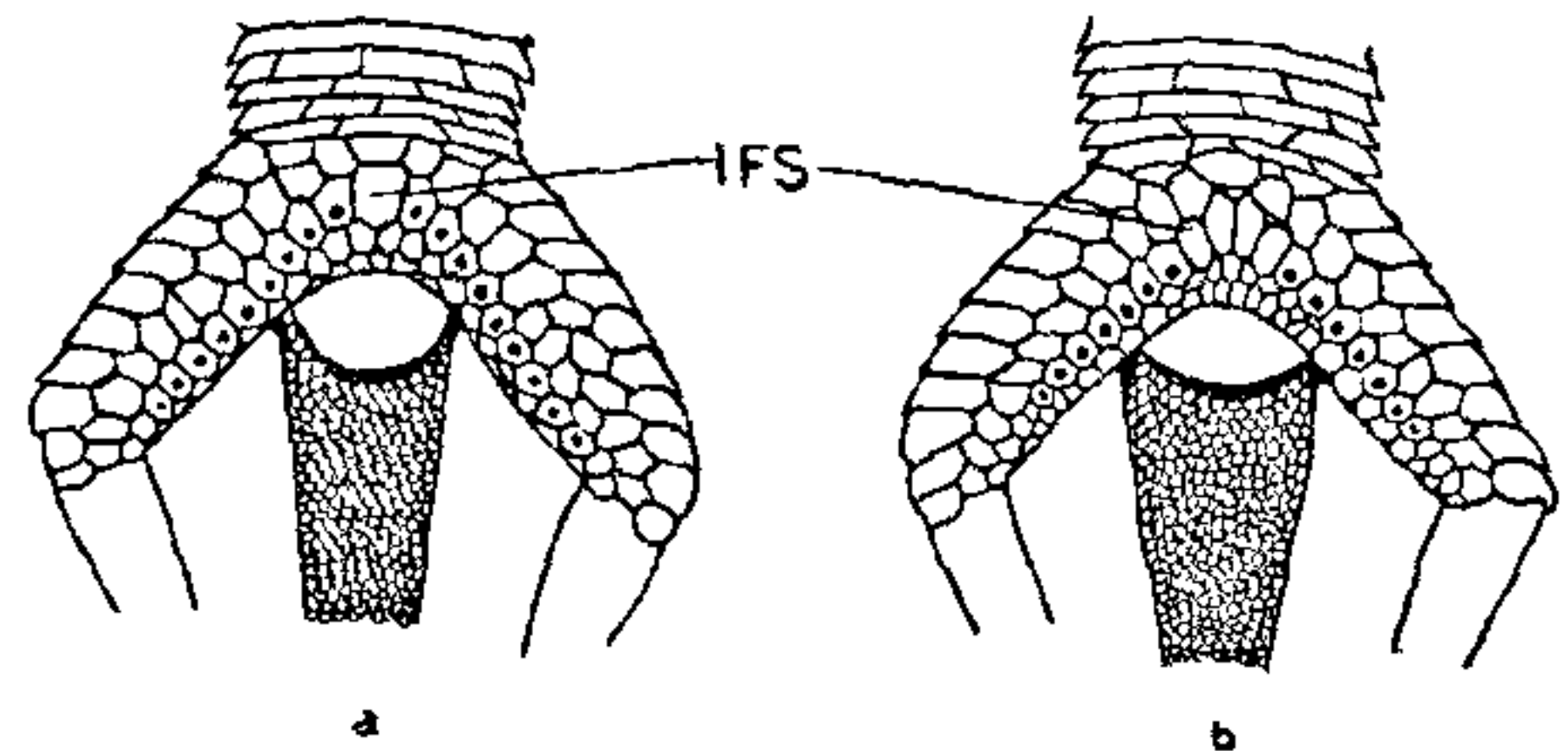


FIG. 1. (a) Drawing of the posterior abdominal scapulation of *O. jerdoni* male to show one interfemoral scale (IFS) lying in between the two most proximal femoral pores of the two sides. (b) The same as above in female *O. jerdoni* showing four IFS in the homologous region.

In females, on the other hand, the interfemoral scales were either 4 or 5 in number. When subjected to one way analysis of co-variance, the difference in the number of the IFS in the two sexes was found to be significant, so as to afford a positive evidence for the presence of sexual dimorphism in the lizard *O. jerdoni*. However, such a sexual dimorphism is altogether absent in the hatchlings of this lizard.

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### CHROMOSOME PAIRING IN SPECIES-HYBRIDS OF *SOLANUM NIGRUM* L. COMPLEX

*Solanum nigrum* is a polyploid complex based on  $x = 12$ . The species of the complex are annual, herbaceous weeds with variable morphological features. The senior author has initiated a programme of investigations on several biosystematic aspects of the species complex. The present note deals with meiotic chromosome pairing in  $F_1$  hybrids between the two