and the lengthening of the light period was done by transferring the pots to a lighted room at sunset and exposing them to 200-c.p. electric light at a distance of 1–2 metres and bringing them outside after the completion of the required light period. The daily light period of the normal (control) gradually rose from 12 hr. to 13 hr. 30 min. and again fell gradually to 11 hr. 18 min. from the sowing to the flowering time. There were three pots per treatment each with four plants, that is, twelve plants per treatment. The mean flowering time and height at flowering are given in Table 2.

Table 2. EFFECT OF DIFFERENT PHOTOPERIODIC TREATMENTS. SOWN ON MARCH 15, PHOTOPERIODIC TREATMENTS COMMENCED ON MARCH 25

Treatment	Mean height in cm. at flowering	Mean flowering time in days after sowing	Remarks
8 hr.	139·1	67	The height of these plants sown in pots and the size of the panicles were much less than those grown in plots
10 hr.	144·4	67	
12 hr.	145·7	93	
14 hr.	206·7*		
16 hr.	198·4*		
Normal (control)	265·5	235	

* Last reading of height after the plants have ceased to grow and the leaves dried up, although there was no flowering in these plants.

It will be found that there is a remarkable earliness of 168 days in flowering in the short light periods of 8 hr. and 10 hr. from normal (control), in 12 hr. light period flowering takes place in 93 days and there is no flowering in the long light periods of 14 hr. and 16 hr. *Sorghum Roxburghii* var. *hians* (Jowar) is thus clearly a short-day plant.

The flowering of plants of widely different sowing times about the same time when the daily light period is 11 hr. 28 min. or less shows that, in its flowering behaviour, this plant is influenced by the daily light period more than any other factor.

Detailed results will be published elsewhere.

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J. C. SEN GUPTA
JYOTIRANJAN SAHA

Botanical Laboratory,
Presidency College,
Calcutta.
May 27.

Gamete Behaviour in *Chlamydomonas*

Chlamydomonas Moewusii is a heterothallic species showing a difference in behaviour between the gametes of the two mating-types, of a kind not previously recorded.

When suspensions of 'plus' and 'minus' gametes are mixed in light, clumps are formed, and, after some minutes, pairs separate, which swim freely for 4–8 hr. During this period of motility there is no nuclear or cytoplasmic fusion, the cells remaining coaxially attached at their anterior ends by a short protoplasmic bridge and progressing regularly in one direction. Although both gametes retain their flagella, only one is active in propulsion. This can be observed under favourable conditions of illumination: the flagella of one cell beat actively, while those of the other trail behind with only occasional twitching.

In order to determine which is the active partner, both physiological and genetic methods of 'labelling' have been used.

(*a*) When cells are kept in darkness for 4–5 days, the protoplasts shrink away from the posterior walls. Such starved cells are readily distinguishable from those in the normal turgid condition. Starved 'plus' cultures may be mated with turgid 'minus', or starved 'minus' with turgid 'plus': in either case, the flagella of the 'plus' partner are those which remain active after pairing.

(*b*) Cells bearing a genetic marker have highly refractive metachromatic globules in the cytoplasm. Gametes of either mating-type may be labelled in this way, and observations of matings again show that the propulsion is effected by the 'plus' partner of a pair.

(*c*) Several 'paralysed' stocks of the 'plus' mating-type have been obtained by ultra-violet irradiation: the cells possess flagella but do not swim. When such cultures are mated with normal 'minus' cells, non-swimming gamete pairs result, a further confirmation that the 'minus' gamete ceases to play a part in swimming after pairing.

An investigation of genetic and chemical factors affecting flagellar action in *Chlamydomonas* is under way.

RALPH A. LEWIN

Osborn Botanical Laboratory,
Yale University,
New Haven, Conn.
Jan. 10.

Pectic Enzymes of the Fungus *Byssochlamys fulva*

Beavan and Brown[1] investigated the pectic enzymes of the fungus *Byssochlamys fulva* and were unable to detect pectin-esterase or polygalacturonase, although protopectinase was shown to be present by its disintegrating action on disks of potato tuber. They concluded that *B. fulva* elaborated a disaggregating enzyme which reduced the molecular size of pectin, without the production of galacturonic acid, on the lines suggested by Kertesz[2].

The examination of two cultures of *B. fulva* in this Department showed that both produced exocellular pectic enzymes, one culture being very active. By growth on suitable solid media, extraction with water, dialysis and solvent fractionation, concentrated preparations could be obtained, which reduced the viscosity of 1 per cent pectin solutions in a matter of minutes, whereas a preparation cited by Beavan and Brown[1] needed approximately ten hours. Purified preparations acting on sodium pectate freed from araban and galactan rapidly degraded the substrate. The amounts of pectin as measured by the calcium pectate method rapidly decreased, and reducing material was formed equivalent in one case to a 63 per cent hydrolysis of the original pectic acid. The reaction mixtures yielded considerable amounts of D-galacturonic acid, which could be estimated semi-quantitatively on the paper chromatogram[3,4,5].

Dialysed preparations acting on pectin at *p*H 6·0 rapidly produced acid, and the pectin-esterase activity could be determined by continuously titrating the acid formed[6] or by estimation of the methyl alcohol liberated.

Byssochlamys fulva therefore elaborates both pectin-esterase and polygalacturonase, and the results of Beavan and Brown are presumably due to the low activity of their preparation, and the well-known phenomenon that a profound decrease in viscosity