

flowering and fruiting stages in the month of January 1938 and was growing in association with a species of *Batrochospermum*. From a comparison of the specimens with characters of the other members of the family, it is found to belong to *Zeylanidium* Tul., which was described by Willis¹ as a sub-genus of *Hydrobryum* Endl. The plant here reported is identified as *Z. lichenoides*. The species has been previously recorded as occurring in Burma, Assam, Bombay Ghats to Travancore and Ceylon.

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Andhra University,
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1. Haines, H. H., *Botany of Bihar and Orissa*, 1924.
5. 2. Hooker, J. D., *Flora of British India*, 1886, 5,
3. Randhawa, M. S. and Joshi, A. C., *Current Science*, 1944, 2. 4. Willis, J. C., "A Revision of the Podostemonaceae of India and Ceylon," *Ann. Roy. Bot. Gard Perad.*, 1902.

EFFECT OF PHOTOPERIODIC TREATMENT ON POLLEN FERTILITY

Out of the five postulated phases in the developmental process of a plant, two have been established with reasonable certainty. Recent evidence^{1,2} gives some indications regarding the nature of two new developmental phases.

During the course of investigations on phasic development of wheat at this Institute, it has been observed that the formation of normally functioning gametes depended upon preliminary phasic changes in the cells of the gametophyte brought about by photoperiodic treatment. As the results appear to be of some academic and practical interest a brief preliminary report is made here.

Graded seeds of three varieties of wheat (*Triticum vulgare*), viz., I.P. 165, I.P. 52 and P.C. 591, were germinated and kept for the first twelve days under the following five 'initial' light treatments:—

(1) Complete darkness; (2) six hours of natural light; (3) twelve hours of natural light; (4) same as No. (3) plus six hours of artificial light; (5) same as No. (3) plus twelve hours of artificial light (200 W. day-light lamp at a distance of 2 ft.).

At the end of this initial light treatment plans were exposed to three photoperiods, viz., (a) short-day—6 hr. day; (b) normal-day—12 hr. day; and (c) long-day—18 hr. day upto the time of anthesis.

Pollen sterility was determined by staining with aceto-carmin and counting the number of stained and unstained grains.

Sterility appears to increase with long as well as short photoperiods, more so in the former case. It is also worthy of note that photoperiodic treatment during the first twelve days has an appreciable effect on pollen sterility. Long-day treatment increases sterility.

TABLE I.

Percentage pollen sterility and fertility indices for I.P. 165, I.P. 52 and P.C. 591 wheat (*Triticum vulgare*) under different photoperiodic treatments

Photo-periodic treatment	* Pollen sterility (per cent).			Fertility index		
	I.P. 165	I.P. 52	P.C. 591	I.P. 165	I.P. 52	P.C. 591
1 a	14.1	21.0	13.8	0.14	0.35	0.06
2 a	13.4	19.9	16.4	0.23	0.41	0.23
3 a	22.4	15.4	16.7	0.21	0.27	0.22
4 a	20.7	16.9	16.9	0.25	0.18	—
5 a	19.3	14.9	17.5	0.25	0.15	0.13
1 b	2.7	3.4	3.4	0.37	0.44	0.36
2 b	2.6	3.4	4.0	0.43	0.39	0.34
3 b	1.0	2.4	3.8	0.36	0.40	0.38
4 b	3.1	6.7	2.2	0.38	0.41	—
5 b	9.8	7.5	8.7	0.31	0.31	0.35
1 c	30.4	17.8	23.7	0.13	0.07	0.09
2 c	21.7	25.8	21.2	0.17	0.10	0.19
3 c	25.5	14.9	19.5	0.14	0.15	0.15
4 c	31.5	32.5	25.5	0.10	0.12	—
5 c	41.5	30.9	26.2	0.09	0.17	0.13

* Each figure is a mean of 12 observations.

Fertility index within has been calculated by dividing the number of grains per ear by the product of numbers of spikelets per ear and the number of florets per spikelet is also adversely affected by long-day conditions.

The reversible nature of the thermo- and photo-induction effects² and abnormalities in development of spike in wheat under the influence of differential photo-treatments, as well as reduction in the number of spikelets and grains under long-day conditions, which have been observed at this Institute (unpublished records of the Imperial Agricultural Research Institute), together with the evidence presented here, as well as the work of O'mara³ on auto-tetraploid *Secale cereale* warrant a suggestion that light has an influence on the developmental process in cereals beyond the photophase.

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1. Chinoy, J. J., *Curr. Sci.*, 1942, 11, 400-402.
2. Whyte, R. O., "Imperial Bureau of Plant Genetics", *Bull.*, 1935, 17.
3. O'mara, J. G., *Amer. Naturl.*, 1942, 76, 386-392.