and to University College of Wales, Aberystwyth, for granting him an SRC Fellowship.

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1. Darlington, C. D. and La Cour, L. F., *J. Genet.* 1940, 40, 185.
2. Davies, H. G., *General Cytochemical Methods*, Vol. I, Academic Press, Inc, 1958.
3. La Cour, L. F., *Heredity*, 1951, **5**, 37.
4. McLeish, J., *Proc. Roy. Soc. B.*, 1963, **158**, 261
5. — and Sunderland, N., *Exptl. Cell Res.*, 1961, **24**, 627.
6. Sharma, A. K., *Chromosomes Today*, 1972, **3**, 248
7. Vosa, C. G, *Ibid.*, 1969, **2**, 189.

KARYOTYPE IN THREE CULTIVATED VARIETIES OF *GLYCINE MAX* (L.) MERR.

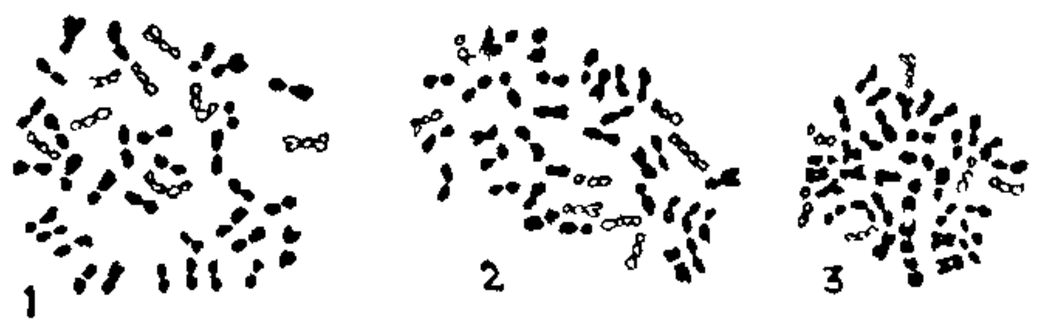
Glycine max (L.) Merr. commonly known as soyabean, is cytologically not adequately explored[3,4,5]. A thorough analysis of karyotype was made only recently in the cultivated variety UPI in *G. max*[1]. In this investigation a comparative study has been made on the detailed cytology of UPI, Improved Pelican and Mammoth. Somatic chromosomes were studied from young root-tips after pre-treatment in saturated paradichlorobenzene solution at 15°C for 2·5 hours and fixation in acetic-alcohol (1 : 2) for 30 minutes followed by hydrolysis in 2% aceto-orcein NHCl (9:1) soluton and finally squashing in 1% aceto-orcein solution. Somatic complement in this species has been found to consist of forty chromosomes (Figs. 1, 2, 3, 7). Secondary constrictions were observed in three to four pairs of chromosomes. The longest pair was provided with supernumerary constrictions. In all the varieties the karyotype was graded and the following morphological types have been observed (Figs. 4, 5, 6).

Type A—Represented by comparatively long chromosomes, each with three constrctions, one primary and the other two secondary. Of these, one was nearly median in position and the other two located in submedian positions at the two ends.

Type B—Represented by medium-sized chromosome each with two contrictions, primary and secondary. One of the constrictions was submedian in position and the other was nearly median to submedian to the longer arm.

Type C—Nearly long chromosomes each with median to nearly median primary constrictions.

Type D—Medium sized chromosomes of slightly ranging length each with submedian primary constrictions.



FIGS. 1–3. Somatic metaphase in varieties UPI, IP and Mammoth respectively ($2n = 40$), × 2,100.

FIGS. 4–6. Idiogram in UPI, IP and Mammoth respectively.

FIG. 7. Photomicrograph ($2n = 40$) in UPI.

Type E—Medium-sized chromosomes each with a primary and a secondary constriction. One of them was submedian in position and the other was nearly median to the longer arm.

Type F—Medium sized to short chromosomes of varying sizes, each with nearly median to submedian primary constrictions.

In the variety UPI, the chromosomes were short to medium-sized ranging from 1·5–3·2 μ, four pairs of them had secondary constrictions and the longest pair having supernumerary constrictions (Figs. 1, 4). All the six morphological types were present in this variety. Two pairs of chromosomes represented type B, one pair of them was comparatively long. Type D was represented by five pairs of chromosomes, two pairs had nearly submedian and three pairs had nearly median primary constrictions. The chromosomes in the variety Improved Pelican were mostly similar to those in the variety UPI having the size range between 1·4–2·4 μ. One pair of chromosome resembled type A but one of the constrictions was located at the distal end. The somatic chromosome complement in the variety Mammoth was quite different from that in the other two varieties; chromosome size in this variety varied from 1·3–2·3 μ. Types A, C and E are absent but B was represented by three pairs of chromosomes, of which one pair was provided with a very short secondary constriction at the distal end of the longer arm. Total amount of chromatin content per haploid complement was 41·4 μ in the variety UPI, 37·4 μ, in Improved Pelican and 36·1 μ in Mammoth.

Karyotype of *G. max* was not thoroughly analysed[4,5]. Detailed karyotype was analysed in *G. max* variety UPI following the technique described in ref. 1. In soyabean, however, a better karyotype was obtained following pretreatment in saturated paradichlorobenzene at 15 C for 1·5–2 hours and fixing in 3:1 for 48 hours at 37°C before hydrolysis and subsequent staining in leuco-basic fuchsin. Besides, the root-tips were incubated in pectirase for 1·5 hours at 30°C[2].

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1. Biswas, A. K. and Bhattacharyya, N. K., *Cytologia*, 1972, **37**, 605.
2. Palmer, R. G. and Hollys Heer, *Crop Sci.*, 1973. **13**, 389.
3. Pritchard, A. J. and Gould, K. F., *Div. Trop. Pastures Tech. Pap.* 2 (C.S.I.R.O., Australia), 1964, p. 18.
4. Sen, N. K. and Vidyabhusan, R. V., *Euphytica*, 1960, **9**, 317.
5. Veatch, C., *Botanical Gazette*, 1934, 96, 189.

PHOTO-INDUCED CONIDIATION IN *ALTERNARIA MACROSPORA* ZIMM. AND *COLLETOTRICHUM GOMPHRENAE* RAO AND SALAM

BOTH quantum and quality of light influence sporogenesis in phytopathogenic fungi[1–5]. But the precise quality of light on sporogenesis has remained elusive till recently. Notable is the near ultraviolet (NUV) light which appears to be effective in inducing sporulation of a few fungi[6–8].

In this note we report on the quality of light influencing sporulation of two fungi. *Alternaria macrospora* Zimm. isolated from *Gossypium hirsutum* and *Colletotrichum gomphrenae* Rao and Salam from *Gomphrena decumbens* sporulated profusely when exposed to 'Black light' fluorescent lamp (320–420 nm) and 'cool white' day light fluorescent lamp (300–700 nm) respectively. *Alternaria macrospora* produced maximum number of spores when exposed to near ultraviolet light, but cultures incubated in daylight fluorescent lamp produced less number of spores (Table I). Several species of *Alternaria* sporulate profusely under near ultraviolet light followed by a period of darkness[9,10].

Of the various media tried, *viz.*, potato dextrose agar, water agar, oatmeal agar, cotton leaf extract agar, Czapek's agar with and without yeast extract (0·1%) and Richards' agar, we found that photo-induced sporulation in *A. macrospora* was more pronounced when grown on modified Richards' agar medium. Cultures incubated in total darkness did not sporulate in all media. Furthermore, lowering the sucrose concentration from 5·0–0·5% in Richards' agar induced the maximum number of spores.

TABLE I

Effect of 'Black Light' and 'Cool white' daylight fluorescent lamps on sporulation of A. macrospora *in culture**

Treatment	Spore No./ml in thousands**
'Black light' lamp	6200
'Cool white' daylight lamp	20
Total darkness	nil

* 12 h light/12 h dark cycle was given and grown on Richards' agar.
Spore counts taken on 10th day after inoculation.
**Each result is an average from three replicates.

Colletotrichum gomphrenae grown on potato dextrose agar sporulated profusely when exposed to visible white light. But, near ultraviolet light from 'Black Light' was not as effective as light from visible white light. Leach[6] concluded that most fungi do not respond to near ultraviolet light in sporulation. Recent report on the effect of visible white light on enhanced spore production by *Trichometasphaeria turcica*[11] agrees with Leach's statement. The response elicited by *C. gomphrenae* also clearly confirms to Leach's[6] conclusion.,

We thank Prof. A. Mahadevan, Director, Centre of Advanced Study in Botany, University of Madras, Madras, India, for critically going through the manuscript.

CAS in Botany, Madras 5, *November* 12, 1976.

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1. Leach, C. M., *Can. J. Bot.*, 1961, 39, 705.
2. Aragaki, M., *Phytopathology*, 1962, **52**, 1227.
3. Honda, Y., *Bull. Inst. agric. Res.*, Tohoku Univ., 1969, **21**, 63.
4. Kumagai, T. and Oda, Y., *Devl. Growth and Diff.*, 1969, **11**, 130.
5. Bhama, K. S. and Swamy, R. N., *Kavaka*, 1973, **1**, 19.
6. Leach, C. M., *Methods in Microbiology*, Vol. IV, ed. by C. Booth, Academic Press, New York and London, 1971, p. 609.
7. Calpouzos, L. and Stallknecht, G. F., *Phytopathology*, 1967, **57**, 679.
8. Tan, K K and Epton H. A. S., *Trans. Br. mycol. Soc.*, 1973, **61**, 147.
9. Leach, C. M., *Can. J. Bot.*, 1967, **45**, 1999.
10. Lukens, W. J., *Am. J. Bot.*, 1963, 50, 720.
11. Benedict, G. G., *Can. J. Bot.*, 1976, 54, 552.