genus *Lepidocyclina* down to the Upper Eocene (Priabonian) in the Indian region.

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September 3, 1940.

[1] *Rec. Geol. Surv. Ind.*, 1907, **35**, 66.

[2] *Orthophragmina* is a typonym of *Discocyclina*.

[3] I am indebted to the Director, Geological Survey of India, for the material and for kind permission to publish this note.

A Note on the Morphology and Chromosome Number of *Litchi chinensis* Sonner

Litchi chinensis is one of the important fruit trees of India. It is cultivated extensively in Behar and Bengal. In 1929 Abdur Rahaman Khan[1] published an account on the pollination and fruit formation in litchi (*Nephelium litchi* Camb.). In this he has given an account of the occurrence of different types of flowers in the panicle as also the periodicity of flowering of the plant. Since then no other important contribution has appeared on the morphology or cytology of the plant.

The present note gives a preliminary account of the results of observations that have been made during the last two seasons. It is proposed to extend the investigations and to publish a fuller account of it in due course.

The author's observations agree in general with those of Khan regarding the nature of the panicle and the types of flowers produced. The cymes, however, were found to bear both "Male" and "Female" flowers during the transition stage. Distinct periodicity of flowering has been noted in different plants. The limits of the flowering period may or may not overlap. Observations made so far indicate that there may be two to five stages of flowering ("Flushes").

The different floral parts develop in the following sequence: calyx, andrœcium and gynæcium. A gynophore is present and a fleshy disc occurs between the calyx and the andrœcium. The so-called "Male" flowers show normal meiotic process and the haploid number of chromosomes has been determined to be fourteen ($n = 14$). A pistillode is present in these flowers, inside which normally developed ovules with integuments are noted but always in a collapsed or shrivelled condition. In the "Female" flowers the filaments of the anthers are very short and perfect pollen grains are produced as a result of normal meiotic process, but the pollen grains are not liberated from the microsporangium due to the non-dehiscence of the anthers. The pollen grains of the "Male" flowers are binucleate at the time they are shed. The pollen grains of both types of flowers are morphologically similar in shape and size and are also viable.

The development of the female gametophyte is of the normal type and a normal eight-nucleate embryo-sac is produced.

The aril arises from two different primordia which develop from the funicle and from the outermost cells of the outer integument. The products of these primordia get fused for a considerable length upwards from the base of the seed, but remain free at the top where they overlap. The fruit shows three distinct layers. The tubercles develop from the epicarp.

My thanks are due to Mr. I. Banerji under whose guidance the investigation is being carried out.

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September 4, 1940.

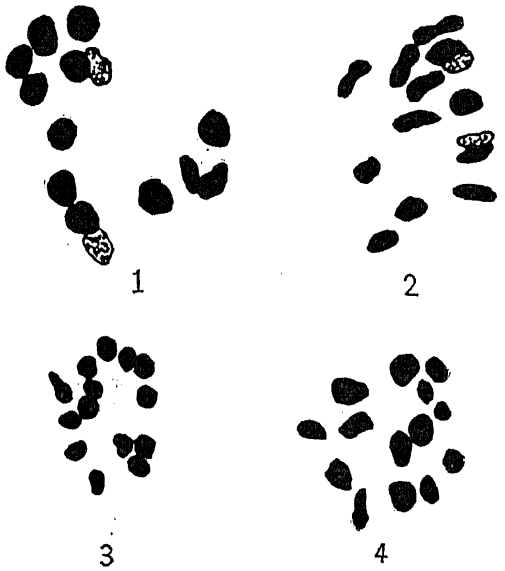
[1] Khan, Abdur Rahaman, *Agri. J. of India*, 1929, 183.

A Note on the Chromosome Numbers of Cassia

IN the present note the writer desires to briefly describe his observations on the chromosome numbers of *Cassia occidentalis* L. and *C. auriculata* L. The first species is widely distributed throughout this country and extends

to all tropical countries, while the second is found in C.P., S. India and Ceylon. The material on which the present observations are based was collected from plants growing wild at Waltair, close to the laboratories of the Andhra University and the chromosome counts have been made from permanent smears of pollen-mother cells fixed in Nawaschin and stained with Iodine, Gentian Violet.

The first report on the chromosome numbers of *Cassia occidentalis* was made by Muto.[1] He found the haploid chromosome number to be 13. Senn,[2] however, contradicts his observations and reports $14n$ chromosomes. My observations on Waltair plants have also revealed $n = 14$ (Fig. 4). Muto's observations thus appear to be incorrect unless the material he studied belongs to some aneuploid variety. A similar discrepancy between the observations of different workers is seen also in *C. tora*. Datta[3] and Senn[2] report the chromosome number as $n = 13$, but Jacob[4] has observed 28 diploid chromosomes in the root tip cells. He explains the difference by suggesting that it may be due to occasional quadrivalent formation during meiosis.



Figs. 1–3.—*Cassia auriculata*. Figs. 1 and 2—I Metaphase. Fig. 3. II Metaphase Fig. 4.—*Cassia occidentalis*, II Metaphase. × 2,700.

The chromosome numbers in *C. auriculata* are more interesting. Jacob[4] has observed in material obtained from Ceylon that there are two types of plants, one with the chromosome number $2n = 14$ and the other with $2n = 16$. In the material from Waltair the writer has found the chromosome number to be $n = 14$ (Figs. 1–3). These plants are thus tetraploid when compared with the Ceylon plants. That these should come from a more northern latitude than the diploid plants apparently supports the views of Hagerup,[5] Tischler,[6] etc., on cytoecology, but clearly a more detailed geographical study is necessary to draw definite conclusions. Polyploidy within a species of *Cassia* has been previously observed in *C. mimosoides* by Kawakami[7] who found plants with $n = 8$, 16 and 24. *C. auriculata*, however, is remarkable for showing both polyploidy and aneuploidy within the species.

The writer is indebted to Dr. A. C. Joshi for help in the preparation of this note and to Mr. J. Venkateswarlu of Andhra University for much help in the collection of the material and verifying the identification of the plants.

J. V. Pantulu.

Benares Hindu University,
Benares,
August 22, 1940.

[1] Muto, A., *Mem. Coll. Sci. Kyoto Imp. Univ., Ser. B.*, 1929, **4**, 265.
[2] Senn, H. A., *Bibliographia Genetica*, 1938, **12**, 175.
[3] Dutta, R. M., *Jour. Ind. Bot. Soc.*, 1933, **13**, 277.
[4] Jocob, K. T., *Ann. Bot., N. S.*, 1940, **4**, 201.
[5] Hagerup, O., *Hereditas*, 1932, **16**, 19.
[6] Tischler, G., *Jour. Ind. Bot. Soc.*, 1937, **16**, 165.
[7] Kavakami, J., *Bot. Mag. Tokyo*, 1939, **44**, 319.

Rain and the Atmospheric Electric Field

I WAS much interested in the note published in the August number of *Current Science* by Mr. A. R. Pillai on the Changes of Atmospheric Electric Potential Gradient during Monsoon Rains in Bombay. May I draw the attention of your readers to a paper published by me in the September 1930 number of *Terrestrial Magnetism and Atmospheric Electricity* on "The Influence of Rain on the Atmospheric Electric Field". The paper is abstracted in *Science Abstracts*.[1] I have shown in the paper that, as a rule, a sharp drop and a reversal of the