

Bd. 12; Redington, H. R., *et. al.*, *Jour. Amer. Water Works Assoc.*, 1931, 23, 1650-93; Naumann, E. Z., *fur Gesund-heitstech U. Stadtehyg.*, 1933, 25, 34.

<sup>3</sup> Hirst, L. F., *Biology of Colombo Water Supply*, 1928, 209-210; Gaffey, A., *Water and Water Engineering*, 1931, 33, 12; Brown, K. W., *Jour. Amer. Water Works Assoc.*, 1934, 26, 1684.

<sup>4</sup> Ellis, D., *Lion Bacteria*, 1919, 147-154.

### Chromosome Numbers in Safflower—

*Carthamus tinctorius*, Linn.

GREGORY, P. J. (1935)<sup>1</sup> has reported from the study of the somatic mitosis the  $2n$  number in Safflower as 20. The authors of the note who worked with Pusa type 24 made several counts in metaphase plates of somatic and meiotic mitoses. These revealed 24 chromosomes for  $2n$  and 12 bivalents for  $n$  respectively.

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<sup>1</sup> *Proc. Ind. Acad. Sci.*, 1935, 1, No. 11.

WITH reference to the above note regarding the chromosome numbers in Safflower (Pusa Type 24), I would like to report on the results so far derived in my present investigation of the chromosome studies of the different Pusa types of Safflower. Of these, I have so far been able to ascertain the chromosome

numbers in two Pusa types (Types 1 and 27), both of which gave the  $2n$  number of chromosomes as 24. So, it is fairly certain that the chromosome numbers in Pusa types of Safflower is  $2n = 24$ . In this connection I would like to add that the varieties I have investigated and published in my previous paper on Safflower (Gregory, P. J., 1935)<sup>1</sup> were distinctly the Coimbatore types and as far as the somatic counts were concerned, the  $2n$  number was 20 in those cases. It may be that the variation in chromosome numbers noted above is due to a varietal difference between the Coimbatore and Pusa types of Safflower. Only further investigation, which is now proceeding, can clearly explain the exact cause of this variation.

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<sup>1</sup> *Proc. Ind. Acad. Sci.*, 1935, 1, No. 11.

### On Some Abnormal Flowers of *Hibiscus Rosa-sinensis*.

IN October 1933 the author collected a number of abnormal flowers from some plants in a private garden in Sagar, Mysore State. The owner of the garden had grown them from cuttings he had brought from some place on the West Coast.<sup>1</sup> All the flowers borne on these plants were abnormal.

Abnormality is seen in the three inner whorls, the corolla, the andrœceum and the gyncœceum. The calyx is normal, with five



Fig. 1. L. S. of flower.

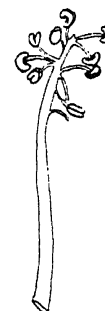


Fig. 2. A Stamen.

lobes; and the epicalyx consists of seven lobes.

The phenomenon known as *positive dédoublement*<sup>2</sup> is seen in the corolla, which consists of five whorls of petals, twenty-seven in all being seen in the transverse section shown in Fig. 3. The outermost whorl has the typical twisted aestivation, the second interpenetrates with the first, and the inner petals are folded in a complicated manner.

The normally monadelphous staminal tube

This combination of the three above-mentioned abnormalities in *H. Rosa-sinensis* is interesting and has not been recorded before,<sup>6</sup> although this species has been known to show diverse kinds of abnormalities. These phenomena are generally regarded as reversionary.

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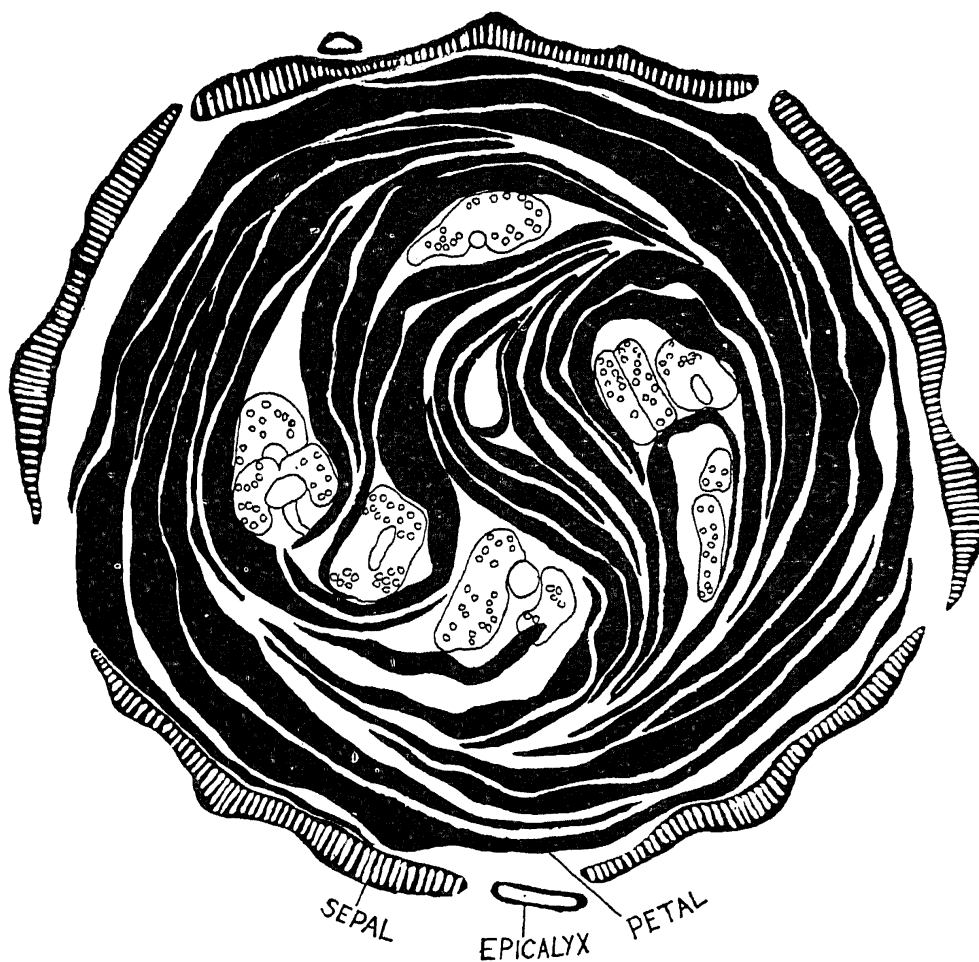


Fig. 3. T. S. of bud. ×5.

(which is theoretically believed to be composed of five fused epipetalous members)<sup>3</sup> has split up into six stamens so that even here there is an increase in number. Each of these six stamens bears an indefinite number of one-celled anthers on connectives (Figs. 1 and 2). This splitting up of the staminal tube known as *Dialysis*<sup>4</sup> has been recorded in Hollyhock (*Althaea rosea*).

The ovary is also abnormal, the carpels having been converted into petaloid structures. This type of metamorphosis has been termed *petalody*.<sup>5</sup>

<sup>1</sup> There is a plant showing the same type of abnormal flowers in Lalbagh, Bangalore.

<sup>2</sup> Worsdell, W. C., *Principles of Plant Teratology*, 1916, Vol. II, 59.

<sup>3</sup> In the normal flower of the Malvaceæ "the fertile stamens are generally very numerous and are considered to have arisen by the multiplication of five epipetalous members".—(Rendle, A. B., *The Classification of Flowering Plants*, 1925, Vol. II, 249.)

<sup>4</sup> Worsdell, W. C., *loc. cit.*, p. 113.

<sup>5</sup> Worsdell, W. C., *loc. cit.*, p. 204.

<sup>6</sup> Worsdell, W. C., *loc. cit.*; Masters, T. M., *Vegetative Teratology*, 1869; Penzig, G., *Pflanzen-Teratologie*, 1921, Band 2; Singh, T. C. N., "Teratology of Indian Plants." *Jour. Indian Bot. Soc.*, 1935, 14, No. 4.