

CHROMOSOMES OF *ERYTHRINA INDICA* LAMK.

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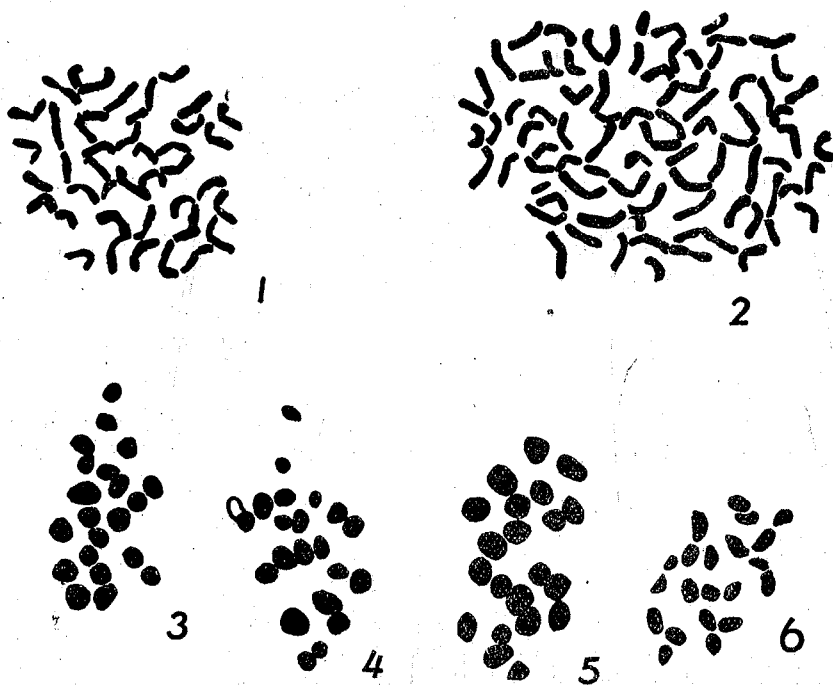
Received for publication on December 15, 1944

THE first observations on the chromosome numbers in the genus *Erythrina* L. (Fam. Papilionaceæ) were made by Tschechow and Kartaschowa, who reported for *Erythrina crista galli* L. [*Micropteryx crista galli* (L.) Walp.] in the same year in one of their papers (Tschechow and Kartaschowa, 1932a) ca. 40 and in another paper (Tschechow and Kartaschowa, 1932b) ca. 44 somatic chromosomes. The smallness of the chromosomes and their fairly large number in the root-tip cells might be the probable reasons for this obvious discrepancy. Next, Senn (1938) reported $2n = 42$ and $n = 21$ chromosomes in *Erythrina herbacea* L., and added that he too could not determine exactly the chromosome number in *E. crista galli*. The purpose of the present note is to report the chromosome number in the Indian Coral Tree, *Erythrina indica* Lamk., which grows wild along the Indian sea-coast and is widely planted in the gardens throughout the country for its large brilliant scarlet flowers. The materials for investigation, seeds and flowers, were obtained from trees growing at Guntur in the Province of Madras.

SOMATIC CHROMOSOMES

The somatic chromosomes were studied in root-tips obtained from germinating seeds. Most of the dividing nuclei showed 42 chromosomes (Fig. 1). These do not exhibit a wide range in size, but are small, slender objects, of nearly the same size and show either median or submedian attachment constriction. The somatic karyotype of *Erythrina indica* Lamk. thus appears to be identical with that of *E. herbacea* L. as sketched by Senn (1938).

During the examination of the sections of the root-tips, besides the monosomatic cells, some disomatic cells were also observed. The dividing nuclei of such cells showed 84 chromosomes (Fig. 2). Such cases of somatic doubling of chromosomes have been reported already in many Leguminosæ. Senn (1938) in his extensive work on the cytology of this family found tetraploid cells in *Albizia Julibrissin* and *Cassia nictitans*, and Iyengar (1938) in *Cicer arietinum*, but the most comprehensive observations in this respect have been made by Wipf (1939) and Wipf and Cooper (1938 and 1940). They have reported the general occurrence of cells with tetraploid nuclei in the roots of several Leguminosæ, such as *Pisum sativum*, *Lathyrus latifolius*, *L. odoratus*, *Lespedeza tomentosa* and *Vicia villosa*, and find a definite



Figs. 1-6. *Erythrina indica* Lamk.—Fig. 1, Somatic metaphase showing 42 chromosomes. Fig. 2. Same showing a tetraploid nucleus with 84 chromosomes. Figs. 3-5. Polar views of Metaphase I ($n = 21$). Fig. 6. Metaphase II; only one plate of a P.M.C. is shown; $n = 21$. $\times 3,000$.

relationship between the normal occurrence of disomatic cells in the roots of these plants and the formation of root nodules. The genetic significance of somatic doubling of chromosomes in restoring the fertility of sterile hybrids and in the origin of new species is already well known and need not be mentioned again here.

MEIOSIS

Observations on pollen mother cells undergoing meiosis showed $n = 21$ both at the I and II metaphase (Figs. 3-6). There are slight differences in size among the various bivalents at the I metaphase, but much importance need not be attached to this, as the size of bivalents in the polar views is determined by the presence and number of chiasmata (cf. Upcott, 1936). Polar views of meiotic chromosomes in *Erythrina indica* are also characterised by a marked degree of secondary association (Figs. 3 and 4). Groups of 2, 3 and 4 bivalents are quite common during the I metaphase and secondary association persists even in II metaphase.

DISCUSSION

The following table summarises the chromosome numbers reported so far in the genus *Erythrina* L.:—

Chromosome Numbers in *Erythrina* L.

Species	<i>n</i>	2 <i>n</i>	Author
<i>E. crista galli</i> L. . . . .	.. ..	ca. 40	Tschechow and Kartaschowa (1932a)
Do. . . . .	.. ..	ca. 44	Do. (1932b)
<i>E. herbacea</i> L. . . . .	.. 21	42	Senn (1938)
<i>E. indica</i> Lamk. . . . .	.. 21	42	This paper

The occurrence of $n = 21$ and $2n = 42$ chromosomes both in *E. herbacea* and *E. indica* make it very probable that in *E. crista galli* also there are 42 somatic chromosomes.

The occurrence of a rather high chromosome number in species of *Erythrina* as compared with most of the Papilionaceæ and secondary association both during the I and II meiotic divisions suggests that the genus *Erythrina* is of a polyploid nature. Taking into account that $n = 21$ is an unusual chromosome number in the Papilionaceæ, Senn (1938) remarked that this may indicate an ancestry through a 7 series or be the result of hybridisation from $n = 10$ and $n = 11$ ancestors with subsequent amphidiploidy. The latter suggestion, according to him, appears possible in view of the taxonomic position of the genus between forms with a basic number 10 and forms with a basic number 11. Future investigators of the cytology of *Erythrina* have to study this problem.

In the end, the author desires to express his appreciation to Dr. A. C. Joshi for his kind interest in the investigation and help in the preparation of this note.

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