

CYTOLOGICAL STUDIES IN SOME INDIAN MEDICINAL PLANTS

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ABSTRACT

Meiotic chromosome numbers of 12 taxa of medicinal plants are reported. Chromosome counts for *Colebrookea oppositifolia* $n=16$, *Cyathula prostrata* $n=21$, *Aerva lanata* $n=8$, *Trema orientalis* $n=20$, *Girardinia zeylanica* $n=10$ and *Streblus asper* $n=13$ are new records for these genera. Chromosome number for *Ophiorrhiza mungos* $n=11$, *Plumbago zeylanica* $n=14$, *Clerodendrum viscosum* $n=24$, *Polygonum chinense* $n=11$, *Acalypha indica* $n=10$ and *A. paniculata* $n=10$ are reported for the first time.

Meiotic chromosome numbers for 12 taxa of medicinal plants belonging to 11 genera spread over 9 Angiospermous families have been reported here along with a note on their ploidy. The medicinal properties of these taxa are given in Chopra, Nayar and Chopra (1956) and Kirtikar and Basu (1935).

Materials were collected from various regions of Madras state during collection trips. Flower buds were fixed in Carnoy's fluid (6: 3: 1) and the young anthers were either treated with a 2% solution of ferric ammonium sulphate for few minutes prior to squashing or directly squashed in propino-carmin. Microsporocytes during different stages of meiotic division were studied and chromosome counts made. Sketches were drawn with the help of camera lucida from temporary mounts.

The chromosome numbers for these 12 taxa are reported for the first time. The new genera investigated are *Colebrookea oppositifolia*, *Cyathula prostrata*, *Aerva lanata*, *Trema orientalis*, *Girardinia zeylanica*, *Streblus asper*. The new species that are reported are *Ophiorrhiza mungos*, *Plumbago zeylanica*, *Clerodendrum viscosum*, *Polygonum chinense*, *Acalypha indica* and *A. paniculata*. The observations are presented in Table I.

The diploid chromosome number in *Ophiorrhiza brunonis* according to Raghavan and Rangaswamy (1941) is 22. *Ophiorrhiza mungos* (Fig. 1) with 11 meiotic chromosomes is a diploid.

In the two species of *Plumbago* investigated, the basic chromosome numbers (Darlington and Wylie, 1955) are 7 and 8 respectively. *Plumbago zeylanica* (Fig. 2) with $n=14$ can be considered a tetraploid species in the series with 7 as the basic number.

From the chromosome numbers recorded for the six species of *Clerodendrum*, the basic number for this genus (Darlington and Wylie, 1955) are 12 and 23. *Clerodendrum viscosum* (Fig. 3) with the haploid number 24 can be considered a tetraploid.

16 is the meiotic chromosome number of *Colebrookea oppositifolia* (Fig. 4). Depending on the reports in several genera of Labiatae (Darlington and Wylie, 1955) if the basic number for the genus is considered as 8, the present species is a tetraploid.

With reference to the various genera in Amaranthaceae investigated, if we presume 7 as the basic number for this genus, *Cyathula prostrata* (Fig. 5) with the chromosome number $n=21$ can be considered a hexaploid species. *Aerva lanata* (Fig. 6) with the meiotic number as 8 can be considered a diploid with the same basic number.

TABLE I

Showing Results for various Taxa.

No.	Family and taxa	Meiotic chromosome numbers	Polyploidy
RUBIACEAE			
1.	<i>Ophiorrhiza mungos</i> L.	11	Diploid
PLUMBAGINACEAE			
2.	<i>Plumbago zeylanica</i> L.	14	Tetraploid
VERBENACEAE			
†3.	<i>Clerodendrum viscosum</i> Vent.	24	Tetraploid
LABIATAE			
*4.	<i>Colebrookea oppositifolia</i> Roxb.	16	Tetraploid
AMARANTHACEAE			
*5.	<i>Cyathula prostrata</i> Bl.	21	Hexaploid
*6.	<i>Aerva lanata</i> Juss.	8	Diploid
POLYGONACEAE			
7.	<i>Polygonum chinense</i> L.	11	Diploid
EUPHORBIACEAE			
8.	<i>Acalypha indica</i> L.	10	Diploid
9.	<i>A. paniculata</i> Miq.	10	Diploid
ULMACEAE			
*10.	<i>Trema orientalis</i> Bl.	20	Tetraploid
URTICACEAE			
*11.	<i>Girardinia zeylanica</i> Dene.	10	Diploid
*12.	<i>Streblus asper</i> Lour.	13	Diploid

* Chromosome numbers for these genera are reports for the first time

† This is the plant commonly listed in our floras as *Clerodendrum infortunatum*, but it is not the Linnean plant, which occurs only in cultivation in India.

The genus *Polygonum* has basic numbers 10, 11 and 17. *Polygonum chinense* (Fig. 7) with $n=11$ can then be a diploid species.

From the reports on the chromosome numbers in a few species of *Acalypha*, Darlington and Wylie (1955) give 7 as the basic number for the genus. In *Acalypha indica* (Fig. 8) and *A. paniculata* (Fig. 9) 10 bivalents were constantly observed in the dividing microspores. The number is same in the buds collected from different plants. It appears that there may be another new number for *Acalypha*. As stated by Perry (1943) more than one basic number is found in some genera of Euphorbiaceae. Hence both the species of *Acalypha* can be considered as diploids.

The meiotic chromosome number in *Trema orientalis* (Fig. 10) is 20. If the basic number is presumed as 10 for the genus the species is a tetraploid.

Girardinia zeylanica (Fig. 11) has meiotic chromosome number $n=10$. This is a new basic number for the family Urticaceae because the other basic numbers reported are 7, 11, 12 and 13.

Streblus asper (Fig. 12) $n=13$ can be considered a diploid species with the same basic number.

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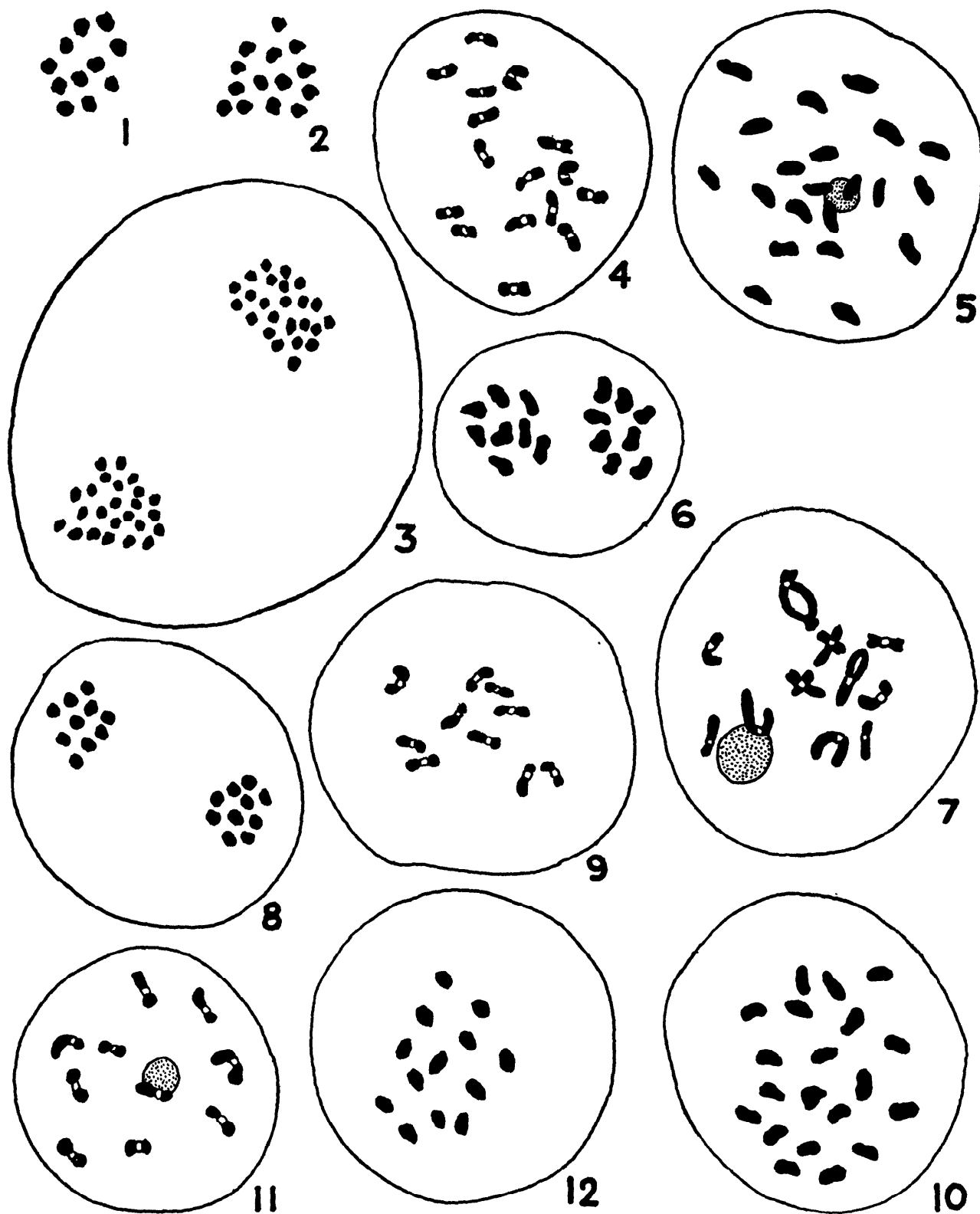


Fig. 1. *Ophiorrhiza mungos* in Metaphase I with 11 bivalents. Fig. 2. *Plumbago zeylanica* in Metaphase I with 14 bivalents. Fig. 3. *Clerodendrum viscosum* in Metaphase II. Fig. 4. *Colebrookea oppositifolia* showing 16 bivalents in Prometaphase. Fig. 5. *Cyathula prostrata* in late diakinesis showing 21 bivalents. Fig. 6. *Aerva lanata* in Metaphase II. Fig. 7. *Polygonum chinense* in diakinesis with 11 bivalents. Fig. 8. *Acalypha indica* in Metaphase II. Fig. 9. *Acalypha paniculata* in Prometaphase with 10 bivalents. Fig. 10. *Trema orientalis* in Prometaphase with 20 bivalents. Fig. 11. *Girardinia zeylanica* in diakinesis with 10 bivalents. Fig. 12. *Strobilus asper* in Metaphase I with 13 bivalents. All figures $\times 1500$.