anisogamy so that the zygospore is lodged in the female cell.

Yet another type of abnormality in conjugation was seen wherein the male gamete after entering the female cell did not fuse with the female protoplast but, instead, both the male and female gametes rounded off inside the female cell forming two parthenospores (Fig. 4).

Dept. of Botany, University of Lucknow, Lucknow-7 (India), *May* 26, 1970.
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CYTOLOGICAL STUDIES IN SOME MEMBERS OF AMARANTHACEAE

AMARANTHACEAE, a small tropical family of 65 genera and 850 species,[6] are of considerable cytological interest. About 56% of the cytologically known species are at various polyploid levels, and aneuploidy is not uncommon. Besides, intraspecific cytotypes are frequently met with. Since the North-West Indian taxa remained untouched cytologically, it was thought desirable to undertake cytological survey of the family from this region with the purpose to record original chromosome counts which might throw light on the cytological evolution of the Indian amaranths. The results of the present investigations are given in Table I.

Alternanthera versicolor with $n = 34$ is a balanced tetraploid and its chromosome number is a new record for the species. But for *Celosia cristata* yellow variety and *Gomphrena globosa*, the chromosomal counts of other species are in agreement with the previous reports.

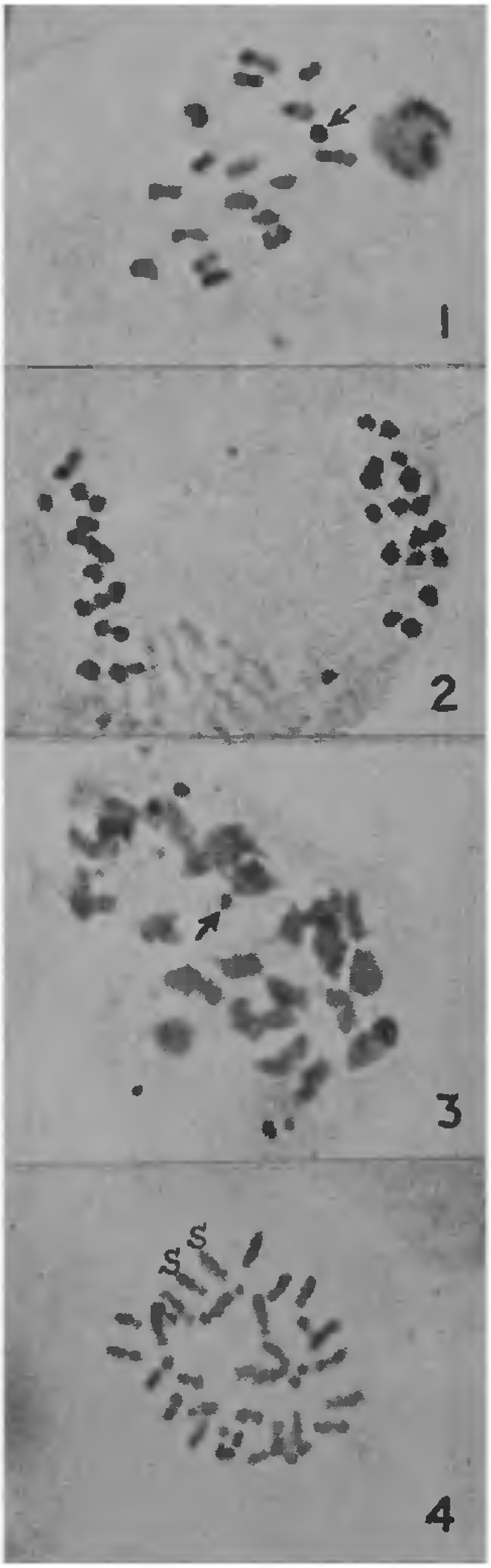
TABLE I

Taxon	Chromosome number	Previous report
Celosia argentia L.	$n=36$	$n=36$; $2n=72$.
C. cristata L. ..		$n=18$; $2n=36$.
Red variety ..	$n=18$	
Yellow variety ..	$2n=35$	
Digera arvensis Forsk.	$n=9$	$2n=12$. $n=9$; $2n=18$.
Amaranthus viridis L.	$n=17$	$n=17$; $2n=34$.
Cyathula tomentosa Moq.	$2n=34$	$n=17$; $2n=34$
Aerua sanguinolenta Bl.	$n=21$	$2n=42$. $2n=44$.
Achyranthes aspera L.	$n=21$	$n=7$. $n=21$; $2n=42$. $n=42$.
Alteranthera versicolor Regl.	$n=34$	
Gomphrena celosioides Mart.	$n=13$	$2n=26$.
G. globosa L. ..	$n=22+0-1$ B	$2n=32$. $2n=40$. $2n=42$. $n=22$; $2n=44$. $2n=45$–48.

The chromosome number $n = 18$ and $2n = 36$ has been reported for *Celosia cristata*.[1,4,5] A few individuals of the yellow variety of the species are found to have $2n = 35$. In all the PMC's examined at diakinesis and MI, one univalent and 17 bivalents are uniformly observed (Fig. 1). The former lags during AI but occasionally is included in one of the poles (Fig. 2). Pollen sterility is 15-20%. The presence of $17_{II} + 1_{I}$ in the yellow variety and 18_{II} in the red variety coupled with widespread occurrence of $2n = 36$ in the species, are indicative of aneuploid derivation of $2n = 35$ from $2n = 36$ by a loss of one chromosome.

Gomphrena globosa, a cytologically variable species, exists in cytotypes with $2n = 32$[3], $2n = 40$, 42[5] and $2n = 44$–48.[2] The presence of B-chromosome has been recorded for the first time in the species. Figure 3 shows a PMC at MI with one B-chromosome and 22 bivalents. In none of the PMC's more than one B-chromosomes have been observed. However, PMC's without B-chromosomes are quite common.

The somatic number, $2n = 34$, for *Cyathula tomentosa*, worked out from root-tip mitosis, confirms the report of $n = 17$ and $2n = 34$.[4] The karyotype is almost symmetrical with six pairs with median, four pairs with submedian and seven pairs with subterminal primary constrictions (Fig. 4). A submedian pair (SS) possesses a secondary constriction situated submedially in the long arm.



FIGS. 1-4. Figs. 1-2. *Celosia cristata* yellow var. Fig. 1. M I with $17_{II} + 1_{I}$, × 2,500. Fig. 2. A I showing 17/18 distribution of chromosomes, × 1,700. Fig. 3. *Gomphrena globosa*: diakinesis with one B-chromosome and 22_{II}, × 1,700. Fig. 4. *Cyathula tomentosa*: mitotic metaphase with 34 chromosomes, × 1,900.

Our sincere thanks are due to Professor S. S. Bir for facilities and encouragement.

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CONTROL OF FRUIT-CRACKING IN PEAR

FRUITS of Conference variety of pear growing on hard clay, acidic soil with pH 5·8 to 6·1 were observed to be badly damaged due to fruit-cracking at the Government Gardens, Chaubattia. The severe cracking of fruits appeared in the above variety during 1968 but not in 1969 (*vide infra*). The symptoms were mainly noted on fruits and they appeared after fruit had attained some size. The crackings were shallow and deep in nature and formed a net-like structure on the surface of the fruit. The trees showing the fruit-cracking were generally stunted in growth and the fruits were small, hard, severely cracked with very rough skin. The cracking was preceded by browning of the tissue and, usually, depression on the fruits. No such symptoms were observed on the other varieties growing in the orchard.

A review of the literature showed that the main cause of these types of symptoms including blossom blast of flowers and buds in pear is boron deficiency (Bullock and Benson, 1948; Richi, 1958; Yataas, 1969). Bullock and Benson (1948) suggested 2 lb. borax per tree as the control of fruits cracking due to boron deficiency. Crompton (1957) could also check the fruit damage due to boron deficiency in Bartlett pear by the application of ½ lb. borax or 2 lb. per 100 gallons per tree sprays. Richi (1958) found the sprays of 0·5% borax very effective in checking the effect of boron deficiency in pear. Agrios (1967) suggested drought, nutrient deficiency and/or viruses as possible causes for net-like, ring-cracking in pear. Rom and Morris (1967) showed that application of sodium polyborate increased the yield, sugar, acidity and vitamin C content of apple sprayed with borax beside controlling boron deficiency in the tree.