

## Chromosome Numbers of Amaranthaceae

Mildred H. Willoughby

Rockford Senior High School, Rockford, Illinois

Recent literature reports a number of chromosome counts made on species of the Amaranthaceae. Both Gaiser<sup>1</sup> and Tischler<sup>2</sup> record only one, *Celosia argentea* L. var. *cristata* Kuntze (*Celosia cristata* L.), reported by T. Morinaga et al.<sup>3</sup> It had a haploid number of 18. A count has been reported on *Achyranthes bidentata* Bl. by T. Sugiura.<sup>4</sup> The diploid number was 42. F. Takagi<sup>5</sup> records chromosome numbers for six more. *Amaranthus tricolor* L., *A. Blitum* L., and *A. spinosus* L. have a haploid number of 17 and a diploid number of 34. *Amaranthus paniculatus* L., *A. mangostanus* L., and *A. caudatus* L. have a haploid number of 16 and a diploid number of 32.

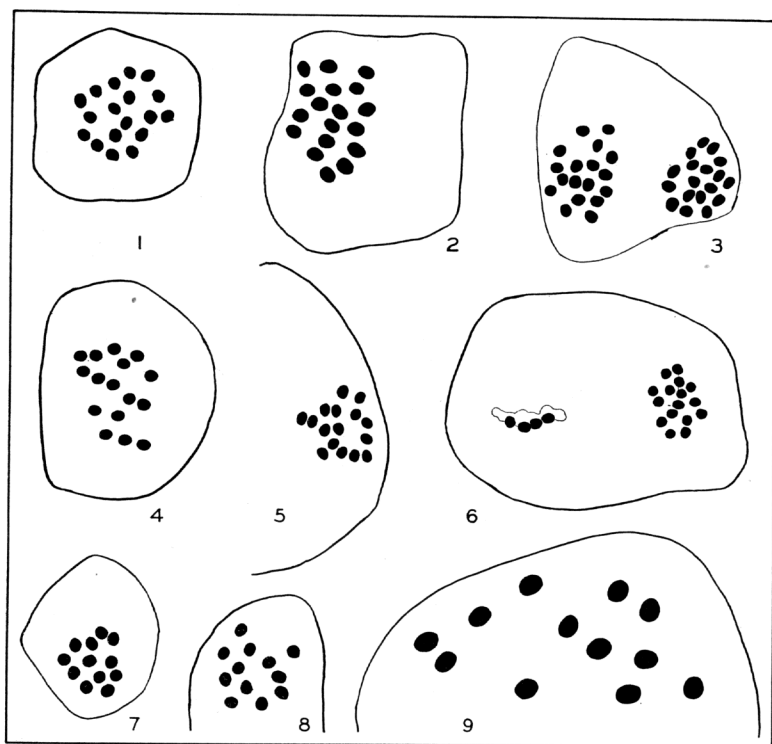


PLATE I.

1. *Celosia argentea* L. var. *Childsii* and 2. *C. argentea* L. var. *chrysanthiflora*, pollen mother cells in metaphase of meiosis I. 3. *C. argentea* L. var. *Thompsonii* in metaphase of meiosis II. 4. *Amaranthus caudatus* L. and 5. *A. hybridus* L. in metaphase of meiosis I. 6. *A. hybridus* L. forma *hypochondriacus* (L.) Robinson. 7. *Alternanthera sessilis* (L.) R. Br. in metaphase of meiosis I. 8. *Gomphrena globosa* L. var. *carnea* and 9. *Froelichia floridana* Moq. in metaphase of meiosis II. All figures are magnified x 1600.

In preparing the material the method of killing and fixing which proved most successful was to pick the buds at approximately the time that the pollen mother cells were dividing, about 1:30 P. M. on a sunny day, and to put them at once into a mixture of one part glacial acetic acid to two parts absolute alcohol. The pollen mother cells could then be examined in acetocarmine at any time within the next forty-eight hours.

Camera lucida drawings were made with a Zeiss microscope with 2 mm. homogeneous immersion objective 1.3 N. A. and 160 mm. tube length using a compensating ocular No. 18. This arrangement with camera lucida produced drawings magnified 4000 times. These are reduced to  $\times 1600$  in the accompanying figures.

A count was made on three varieties of *Celosia argentea* L.: var. *Childsii*, var. *chrysanthiflora*, and var. *Thompsonii*. All three had a haploid number of 18.

According to Schinz<sup>6</sup> *Celosia* belongs to the tribe *Celosieae* in the subfamily *Amaranthoideae*. *Achyranthes* and *Amaranthus* belong to the same subfamily but to different subtribes of the tribe *Amarantheae*. Chromosome counts were made on *Amaranthus hybridus* L. and *A. hybridus* L. forma *hypochondriacus* (L.) Robinson, and a recount on *A. caudatus* L. In all three the haploid number was 16.

Pollen mother cells of three species of the subfamily *Gomphrenoideae* were examined. All three belong to the same tribe, *Gomphreneae*. *Froelichia floridana* Moq. and *Alternanthera sessilis* (L.) R. Br. belong to the same subtribe, *Froelichiinae*. Both have a haploid chromosome number of 12. The chromosomes of *Froelichia floridana* (fig. 9) were the largest of any of those counted at this time. The pollen mother cells were also the largest and were very few in number. *Gomphrena globosa* L. var. *carnea* belongs to the subtribe *Gomphreninae*. Its haploid number was also 12.

The chromosome counts so far made on the *Amaranthaceae* show more variation in number among the *Amaranthoideae* than among the *Gomphrenoideae*. The numbers as far as they are known at present are tabulated in the following list:

SPECIES	n	2n	REPORTED BY
<i>Celosia argentea</i> L.			
var. <i>Childsii</i> .....	18		Present paper
var. <i>chrysanthiflora</i> .....	18		Present paper
var. <i>cristata</i> Kuntze .....	18		Morinaga et al, 1929
var. <i>Thompsonii</i> .....	18		Present paper
<i>Amaranthus Blitum</i> L. ....	17	34	Takagi, F. 1933
<i>A. caudatus</i> L. ....	16	32	Takagi, F. 1933
<i>A. caudatus</i> L. ....	16		Present paper
<i>A. hybridus</i> L. ....	16		Present paper
<i>A. hybridus</i> L. var. <i>hypochondriacus</i> (L.) Robinson .....	16		Present paper
<i>A. mangostanus</i> L. ....			Takagi, F. 1933
<i>A. paniculatus</i> L. ....	16	32	Takagi, F. 1933
<i>A. spinosus</i> L. ....	17	34	Takagi, F. 1933
<i>A. tricolor</i> L. ....	17	34	Takagi, F. 1933
<i>Achyranthes bidentata</i> Bl. ....		42	Sugiura, T. 1931
<i>Froelichia floridana</i> Moq. ....	12		Present paper
<i>Alternanthera sessilis</i> (L.) R. Br. ....	12		Present paper
<i>Gomphrena globosa</i> L. var. <i>carnea</i> .....	12		Present paper

I am indebted to Dr. C. S. Gager, Director of the Brooklyn Botanic Garden, for furnishing seeds of the species mentioned except *Amaranthus hybridus* L. and *A. hybridus* L. forma *hypochondriacus* (L.) Robinson. I am indebted also to Dr. John T. Buchholz of the Department of Botany at the University of Illinois for suggestions and criticism. This investigation was carried out while the writer was holding the Rockford College Scholarship to the Graduate School of the University of Illinois.

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