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(Fortsetz. folgt.)

Chromosome Numbers of cultivated Plants II.¹

By

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The following observations were exclusively made on permanent preparations made by the paraffin method. Benda's, Bouin's and Carnoy's fixatives were used in this work.

All figures are drawn with the aid of Abbe's large drawing apparatus under the use of a Zeiss apochromatic objective 1.5 mm. and compensation ocular 18. The magnification is 4,000.

Andropogon Sorghum, BROT. var. *vulgaris*, HACK. (Gramin.) *Sorghum*.
 $2n=20$

The number of chromosomes of *A. Sorghum* was decided as ten in haploid by KUWADA and EM. MARCHAL.² We observed twenty rod-shaped chromosomes of nearly equal size in the root-tip cell of *A. Sorghum* var. *vulgaris* (Fig. 1). The anaphasic figures show that the point of the spindle fibre attachment is terminal for some chromosomes, and median or submedian for others.

Setaria italica, KUNTH. (Gramin.) Foxtail millet. $2n=18$

Eighteen chromosomes of nearly the same size as *Sorghum* ones were counted invariably in the root-tip cells (Fig. 2).

Yucca filamentosa, L. (Liliac.) Adams needle. $n=30$.

The haploid number of chromosomes of this common *Yucca* was

1. Contributions from the Institute of Agronomy, Kyushu Imperial University, No. 16.

2. *Tabulae Biologicae* Bd. IV. (1927)

decided by us as thirty. As shown in Fig. 3, which represents the heterotypic plate of the pollen mother-cell, five chromosomes are markedly larger than the others. Some size differences are also noticed among the twenty-five small chromosomes.

Musa Basjo, SIEB. (Musac.) $n=11$

The chromosome number of this plant was decided as eleven in haploid by d'ANGREMOND.¹ We also observed eleven chromosomes in the heterotypic and homotypic anaphases of the pollen mother-cell (Fig. 4. heterotypic anaphase). The achromatic spindle occupies only a very small space of the extraordinarily large pollen mother-cell. The cell-wall formation occurs successively and the tetrad is usually composed of the four microspores arranged in one row.

Zingiber Mioga, ROSC. (Zingiberac.) $2n=55?$ $n=28?$

In all clear metaphasic figures in the root-tip cell of this plant we counted constantly fifty-five slender chromosomes as shown in Fig. 5. Unfortunately we could not find the meiotic figures, but we were able to observe two metaphasic figures of the division of the microspore nucleus. Here we counted twenty-eight chromosomes as depicted in Fig. 6.

Celosia cristata, L. (Amarantac.) cockscomb. $n=18$

The haploid number of chromosomes of this plant was decided as eighteen. All the chromosomes take round shape in the heterotypic metaphase (Fig. 7).

Phytolacca acinosa, ROXB. var. *Kaempferi*, MAK. (Phytolaccac.) $n=18$

Eighteen spherical chromosomes were clearly counted in the heterotypic metaphase of the pollen mother-cell (Fig. 8).

Nelumbo nucifera, GAERTN. (Nymphaeac.) East Indian lotus. $2n=16$

In the root-tip cell of this lotus we invariably observed sixteen chromosomes of various sizes. Two are markedly large and four are very small. The remaining ten chromosomes are also not of equal size. The constriction is very noticeable in some of those chromosomes (Fig. 9).

Illicium anisatum, L. (Magnoliac.) $n=14$

The haploid chromosome number decided at the heterotypic metaphase of the pollen mother-cell is fourteen. The chromosomes are very large and some size differences are noticed among them (Fig. 10).

We also observed 56-57 chromosomes in the heterotypic division

1, Tabulae Biologicae, Bd. IV. (1927),

of *Magnolia grandiflora*, L.

Nandina domestica, THUNB. (Berberidac.) $n=10$

The haploid chromosome number of this shrub was decided as ten at the heterotypic metaphase of the pollen mother-cell (Fig. 11).

Eschscholtzia californica, CHAM. (Papaverac.) $n=6$

WINGE¹ already reported the chromosome number of this plant as six in haploid. We also observed six chromosomes in the microsporocyte divisions. Fig. 12 shows six chromosomes with quadripartite appearance in the heterotypic metaphase. In the homotypic metaphase they appear slightly slender.

Hydrangea opuloides, K. KOCH. f. *Hortensis*, MAXIM. (Saxifragac.) $n=18$

The fixation of the pollen mother-cell of this shrub was rather difficult, but we could count with no doubt eighteen chromosomes in the heterotypic metaphase and anaphase (Fig. 13. heterotypic metaphase).

Chaenomales lagenaria, KOIDZ. (Rosac.) Japanese quince. $n=17$

From the observation of the heterotypic metaphase of the pollen mother-cell the haploid number of chromosomes of this shrub was decided as seventeen (Fig. 14).

Eriobotrya japonica, LINDL. (Rosac.) Loquat. $n=17$

In the heterotypic metaphase of the pollen mother-cell of this common fruit plant in Japan, we observe invariably seventeen chromosomes as its haploid number (Fig. 15).

Mercurialis leiocarpa, SIEB. et ZUCC. (Euphorbiac.) $n=24$

This plant show twenty-four chromosomes in the heterotypic metaphase of the pollen mother-cell (Fig. 16). All the chromosomes are round and of nearly equal size.

Zigypus vulgaris, LAM. var. *inermis*, BUNGE. (Rhamnac.) Common jujube. $n=12$

The haploid number of chromosomes of this fruit plant was decided as twelve. Fig. 17 shows twelve spherical chromosomes in the heterotypic metaphase of the pollen mother-cell.

Thea sinensis, L. (Theac.) $n=15$

The chromosome number of this shrub was described as fifteen in haploid by COHEN and STUART.² Fig. 18 shows fifteen chromosomes observed by us in the first division metaphase of the pollen mother-cell. Marked size differences of chromosomes are noticed

1. Tabulae Biologicae Bd. IV. (1927),

2. Tabulae Biologicae Bd. IV. (1927),

in the figure.

Punica Granatum, L. (Punicac.) $n=8$

We found eight as the haploid chromosome number of this common fruit tree in Japan. Fig. 19 shows the chromosomes observed in the heterotypic metaphase of the pollen mother-cell.

Rhododendron quinquefolium, BISS et MOORE var. *speciosum*, MAK. ? (Ericac.) $n=13$

Thirteen spherical chromosomes of equal size were observed in the heterotypic division of the pollen mother-cell. Fig. 20 shows the chromosome complement in the heterotypic anaphase.

Salvia nipponica, MIQ. var. *argutidens*, MAKINO (Labiata.) $n=8$

As presented in Fig. 21 (heterotypic metaphase) this plant shows eight spherical chromosomes of various sizes in the meiotic division of the pollen mother-cell.

Lycium chinense, MILL. (Solanac.) $n=12$

We decided the haploid number of chromosomes of this plant as twelve. Fig. 22 represents the chromosomes in the homotypic metaphase of the pollen mother-cell.

Sesamum indicum, L. (Pedaliac.) Sesame. $2n=26$

Twenty-six rod-shaped chromosomes of nearly equal size were constantly observed in the root-tip cell (Fig. 23).

Luffa aegyptica, MILL. (Cucurbitac.) $n=13$

We clearly observed thirteen chromosomes in the homotypic metaphase of the pollen mother-cell (Fig. 24). As in many other species of the family the achromatic spindle occupies a comparatively small space of the large mother-cell.

Centaurea Cyanus, L. (Composit.) Dusty miller. $n=12$

We decided the haploid chromosome number of this plant as twelve. All the chromosomes are very small and round in shape as depicted in Fig. 25 (two sister plates of homotypic division of a pollen mother-cell).

Gaillardia pulchella, Foug. (Composit.) $n=18$

As shown in Fig. 26 eighteen fairly large chromosomes were observed in the heterotypic division of the pollen mother-cell. 3 chromosomes in the figure are disjoining. Some size differences are also noticed in the figure.

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