

# STUDIES ON CYTOGENETICS OF XINJIANG WILD RAPE

## IV. ANALYSIS OF GROSS MORPHOLOGY OF CHROMOSOMES

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### ABSTRACT

The gross morphology of chromosomes of Xinjiang wild rape were studied in this paper: The main results are (1) the length of chromosomes vary range from 5.01 to 3.59  $\mu\text{m}$ , in which the microchromosomes are 67% in the complement, (2) the type of centromere belong to localized centromere, (3) the number of chromosomes and karyotype are  $2n=18-16M+2SM$ , (4) the size of satellites belong to small satellites with on pair or two pairs satellites, (5) the number of chromosome banding generally are 32-34 with the one pair chromosome showed whole band and (6) the meiosis of pollen mother cells generally are normal and meiotic index is 96.2%. Xinjiang wild rape is stability type.

### INTRODUCTION

Xinjiang wild rape distributes extensively in the west of China, which grows under the complex geography environment condition and has some variance of morphology and physiologic characteristics. It is a very valuable resource in China and is attended by geneticists and breeders. In order to effect using it. The gross morphology of chromosomes of Xinjiang wild rape were studied in this paper.

### EXPERIMENTAL

#### Material offering

Xinjiang wild rape No. 75, No. 149, No. 157, No. 168 from Xinjiang Agricultural Institute are used in this experiment.

Basic method

Basic method for preparing mitotic late prophase has been mentioned (Li sun, 1987) and made somewhat modify. According to Levan's (1964) classification method calculated arm ratio. Karyotype classification is used by Stebbins' method (1971). Meiotic index calculated formula as

$$\text{Meiotic index} = \frac{\text{No. of normal cell}}{\text{No. of total}} \times 100\%$$

Main results

1. Size of chromosome The size of chromosome is most obvious morphological characteristic of chromosomes. In order to demonstrate these characteristics, the length of chromosome, relative length, total length and range in size were observed (Table 1.). The length of chromosome usually vary range in size from 5.01 to 3.59  $\mu\text{m}$ , in which the microchromosomes are 67% in the complement.

TABLE 1. The size of chromosome, Arm ratio and chromosomeal type in Xinjiang wild rape\*

No. of chromosome	Length of chromosome ( $\mu\text{m}$ )	Relative length $\bar{X} \pm \text{S. E.}$	Arm ratio	Chromosomeal type
k1	5.01	13.09 $\pm$ 0.06	1.40	M
k2	4.43	12.95 $\pm$ 0.05	1.00	SM
k3	4.32	12.64 $\pm$ 0.04	1.1	M
k4	3.70	10.42 $\pm$ 0.03	1.1	M
k5	3.68	10.32 $\pm$ 0.01	1.2	M
k6	3.61	10.16 $\pm$ 0.03	1.2	M
k7	3.61	10.14 $\pm$ 0.02	1.3	M
k8	3.60	10.12 $\pm$ 0.04	1.4	M
k9	3.59	10.12 $\pm$ 0.03	1.2	M
Total length	35.55			

\* The number is average of four type of Xinjiang wild rape.

2. Type of centromere The centromere of chromosome is localized centromere in Xinjiang wild rape. It constitutes the normal condition in which a chromosome possesses a permanently localized region to which the spindle fiber attaches during chromosome movement.

3. Karyotype and Number The karyotype and number of chromosome were analyzed in late prophase. The results indicate that the chromosome number of Xinjiang wild rape is  $2n=18$ , with 8 metacentric chromosome pairs and one pair submetacentric chromosome. The karyotype formula as  $2n=18=16M+2SM$ .

## 4. The number and size of satellites.

The number of satellites in Xinjiang wild rape was observed and could be classified as follows: Xinjiang wild rape No.75 and No.149 have one satellite pair, but No.157, No.168 have two satellite pairs. The size of satellite all belong to small satellite.

5. Effect of stained After chromosome of Xinjiang wild rape stained with Giemsa. The number of chromosome banding patterns usually range about from 32 to 34. They included centromeric band, intercalar band, telomeric band, whole band in one arm, whole band in two arms and so on.

6. Meiotic and Meiotic index The meiosis of pollen mother cells generally are normal (Table 2). The tetraspores were tetrahedral type, and meiotic index is 96.2%. Therefore Xinjiang wild rape is a stability type.

TABLE 2. The chromosome behaviour of meiosis and microsporogenesis in Xinjiang wild rape

Stage	Total cell No.	Normal cell No.	Laggind chromosome	Chromosome bridge	Abnormal
Metaphase I	100	96	4		
Metaphase II	100	97	3		
Anaphase I	100	96		2	
Tetraspore	100	96			4
Pollen	100	94			6
Total	500	481	7	2	10

### Discussion

As noted above these reasons, we can consider that Xinjiang wild rape is a stability type. Because of the recentness of the discovery in most morphological characteristics are more similar to a *B. nigra*. Therefore it can be accepted was *B. nigra*. But we considered that Xinjiang wild rape and *B. nigra* aren't the same species, only has a close related with *B. nigra*. These aspects will be discussed in other paper.

### REFERENCES

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