

REPORTS ON THE CHROMOSOME NUMBERS OF 8 SPECIES IN *GENTIANA* (GENTIANACEAE)*

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Abstract

In the present paper, reported are the chromosome numbers of eight species in *Gentiana*. The results are as follows: *G. trichotoma* $2n=24$; *G. microdonta* $2n=24$; *G. rubicunda* $2n=72$; *G. chinensis* $2n=24$; *G. striata* $2n=46$; *G. waltoni* $2n=26$; *G. aristata* $2n=28$; *G. straminea* $2n=26$. The chromosome numbers are recorded for the first time for the former six species.

Key words: *Gentiana*; Chromosome; number

Gentiana is a subcosmopolitan genus with 15 sections and about 361 species according to Ho & Liu (1990). 312 species are known in Asia, of which about 247 occur in China. Undoubtedly chromosome data play an important role in resolving the problems of the phylogeny of the genus *Gentiana*. However, the existing chromosome data for Chinese gentians are extremely incomplete except a few reports by Yuan (1993), Yuan & Kupfer (1993) and Kupfer & Yuan, (1996). We attempted, by observing as many species and populations as possible, to find the key chromosome numbers and the links between them, in order to understand the chromosomal evolution of the genus. This paper is the fifth in a series of reports (Ho et al. 1997; Chen et al. 1997) dealing with chromosomal observations on Chinese gentians.

Materials and Methods

The voucher specimens are preserved in the herbarium of Northwest Plateau Institute of Biology, the Chinese Academy of Sciences, The People's Republic of China (HNWP). The procedure in the present paper was as same as our former reports (Ho et al. , 1997; Chen et al. 1997). At least 20 cells were counted.

Result and Discussion

1. *Gentiana trichotoma* Kusun. (Sect. *Frigida*) Plate I : 1

The chromosome number of this species is $2n=24$. The chromosome number of this species are reported

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here for the first time. The root tips were collected from Huzhu county of Qinghai province, alt. 3600m, Lu Xuefeng 551.

2. *Gentiana microdonta* Franch. (Sect. *Frigida*) Plate I : 2

The species shows the chromosome number of $2n = 24$. The chromosome number of this species is here reported for the first time. The root tips studied were collected from Yulong Snowmountains of Lijiang county of Yunnan province, alt. 2900m, Liu Jianquan 347.

Both *G. microdonta* and *G. trichotoma* belong to the section *Frigida*. Yuan & Kupfer (1993) summarized the chromosome data of this section. They suggested the basic chromosome number of this section should be $X = 12$. Our results confirm their suggestion.

3. *Gentiana aristata* Franch. (Sect. *Chondrophylla*) Plate I : 3

The species show the chromosome number of $2n = 28$. This chromosome number is newly recorded for this species. The root tips were collected from Menyuan county of Qinghai province, alt. 3500m, Xue Chunying 04.

The chromosome numbers of $2n = 14$ and $n = 7$ had been reported for this species (Ho et al. , 1997; Kupfer & Yuan 1996). The basic chromosome number of *G. aristata* should be $X = 7$. The population studied in the present paper is a tetraploid.

4. *Gentiana rubicunda* Franch. (Sect. *Chondrophylla*) Plate I : 4

The chromosome number of this species is $2n = 72$. The chromosome number is here reported for the first time. The root tips were collected from Tianquan county of Sichuan province, alt. 2200m, Liu Jianquan 277.

This species with $2n = 72$ is undoubtedly a polyploid. However, what is its basic number? $X = 6, 8, 9$ or 12 ? Four basic numbers had been found in the section *Chondrophylla* (Kupfer & Yuan 1996). With limited data available now, it is impossible to determine the basic number and the polyploidy level of *G. rubicunda*.

5. *Gentiana chinensis* Franch. (Sect. *Isomeria*) Plate I : 5

The chromosome number of this species is $2n = 24$. The chromosome number of this species is here reported for the first time. The root tips were collected from Mt. Emei of Sichuan province, alt. 3000m, Liu Jianquan 266.

In section *Isomeria*, only one species (*G. glauca*) was observed concerning the chromosome number. This species was always found to have $2n = 24$ (Dawe & Murray 1979; Zhukova 1982, 1980). The chromosome number of *G. chinensis* with $2n = 24$ revealed in the present paper is as same as that of *G. glauca*. Their basic chromosome number might be $X = 12$ if compared with the basic number of other sections such as *Frigida* (Yuan & Kupfer, 1993).

6. *Gentiana waltonii* Burk. (Sect. *Cruciata*) Plate I : 8

The chromosome number of this species is $2n = 26$. The chromosome number of this species is here reported for the first time. the root tips were collected from Quxu county of Tibet province, alt. 3700m, Liu Jianquan 48.

7. *Gentiana straminea* Maxim. (Sect. *Cruciata*) Plate I : 7

The chromosome number of this species is $2n = 26$. This chromosome number is newly recorded for this

species. The former report revealed the chromosome numbers of other populations were $2n = 52$ (Yuan 1993). The root tips were collected from Menyuan county of Qinghai province, alt. 3500m, Lu Xuefeng 492.

G. waltonii and *G. straminea* belong to the section *Cruciata*. This section has a very stable basic chromosome number $X = 13$ (Yuan 1993). Our observations confirm this basic number. Two species studied in the present populations have $2n = 26$, which indicates they both are diploid.

8. *Gentiana striata* Maxim. (Sect. *Cruciata*) Plate I : 6

The chromosome number of this species is $2n = 46$. Our observation confirms the report on the chromosome number of this species by Yuan & Kupfer (1993) and Chen et al. (1997). The ovary materials were collected from Pingan county of Qinghai province, alt. 2100m, Lu Xuefeng 94.

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八种龙胆属植物的染色体数目

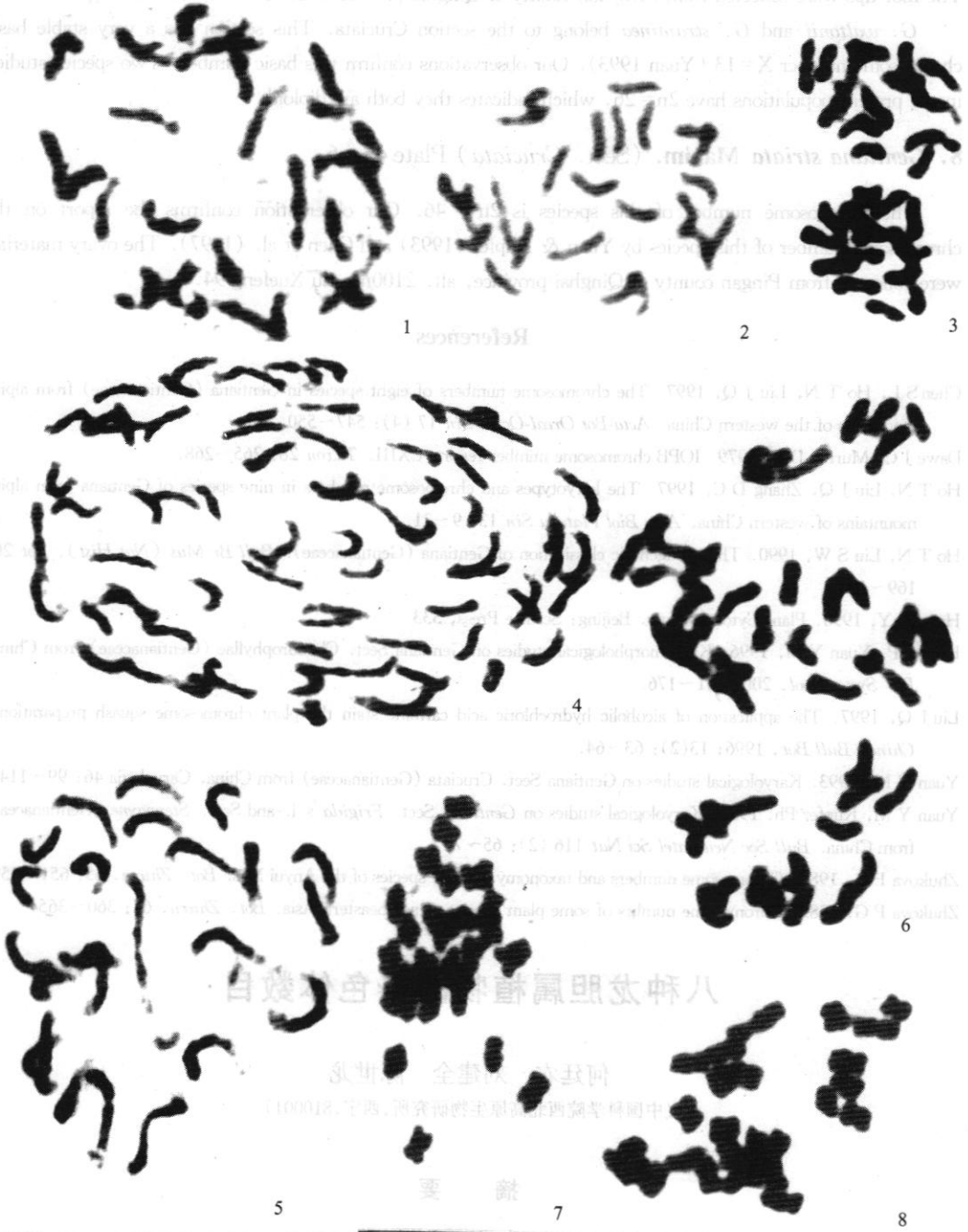
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摘 要

本文报道了龙胆属 8 种植物的染色体数目。结果如下: 三歧龙胆 $2n = 24$; 小齿龙胆 $2n = 24$; 深红龙胆 $2n = 72$; 中国龙胆 $2n = 24$; 条纹龙胆 $2n = 46$; 长梗秦艽 $2n = 26$; 刺芒龙胆 $2n = 28$; 麻花艽 $2n = 26$ 。前 6 种植物的染色体数目为首次报道。

关键词: 龙胆属; 染色体数目



1. *Gentiana trichotoma*, 2n=24; 2 *G. microdonta* 2n=24; 3. *G. aristata*, 2n=28; 4. *G. rubivunda*, 2n=72; 5. *G. chinensis* 2n=24; 6. *G. striata* 2n=46; 7. *G. straminea* 2n=26; 8. *G. waltoni* 2n=26. Scale bars = 10 μ m