



Karyomorphological Analysis of *Barleria prionitis* Linn. (Acanthaceae) from India

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ABSTRACT

Karyomorphological study of *Barleria prionitis* Linn. has been done using standard cytological techniques. Diploid chromosome number have determined to be $2n = 40$. Karyotype are worked out and shown in Table 1 and 2 and ideographically in figure 1.

Key words: Karyotype, mitosis, *B. prionitis*, idogram.

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INTRODUCTION

Barleria is a large pantropical, polymorphic, widely spread genus within the family Acanthaceae, represented by about 300 [1] distributed predominantly in tropical regions of the Old World. The species are distributed from Japan in the far East to as far west as Central America and Mexico [2]. The centre of maximum species diversity is in tropical East Africa, followed by South Africa and Asia. India is represented by 29 taxa of which 14 are endemic.

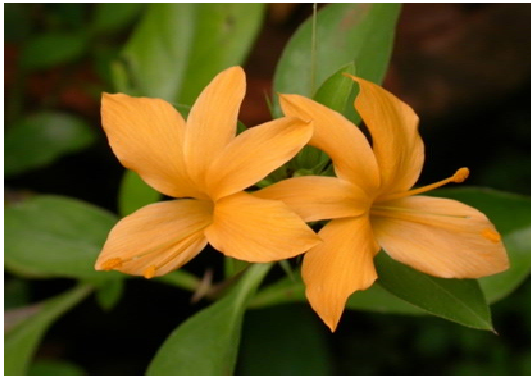
Studies on different populations of same species from different geographical regions of India, revealed an existence of morphovariants in some species [3-10]. Chromosome number report survey in the genus revealed that *Barleria* species have $n = 20$ and $2n = 40$ based on $x = 10$. Aneuploidy might have played important role in the evolution of the polybasic numbers in some species including *Barleria prionitis*. Therefore, an attempt has been made to study chromosome number and karyotype analysis of *B. prionitis* in the present communication.

MATERIAL AND METHODS

Cytological studies were made from root tips for mitosis from the plants cultivated in botanical garden. The roots were also obtained from germinated seeds. Excised root tips were pretreated with aqueous saturated solution of para dichloro-benzene (pDB) at 8–10°C for 3 to 4 hrs. Root tips were hydrolyzed in 1N HCl and stained with 2% propionic-orcein and were squashed in 45% acetic acid. Suitable somatic plates were photographed with a Nikon Coolpix-4500 digital camera. 20 well-separated somatic chromosome plates were selected for karyotype analysis by adopting standard method [11]. For analysis and comparison of the karyotype the chromosomes of *Barleria* were categorized on the basis of their length and centromeric position.

RESULTS

Somatic chromosome number of *B. prionitis* is $2n = 40$. Three different chromosome types could be identified in the species examined karyologically (Table 1). The chromosomes in size ranged from 2.05 μ to 5.85 μ in length and centromere positions remained median for all the chromosomes. The mean chromosome length was found to be 3.61 μ . The data on chromosomes, 'd', 'r' and 'i' values, centromeric position and type of chromosome in chromosome complements of the species is presented in Table 2 and shown ideographically in Figure 1.



Flowering twig of *B. Prionitis* Linn.



Somatic chromosome no. $2n = 40$

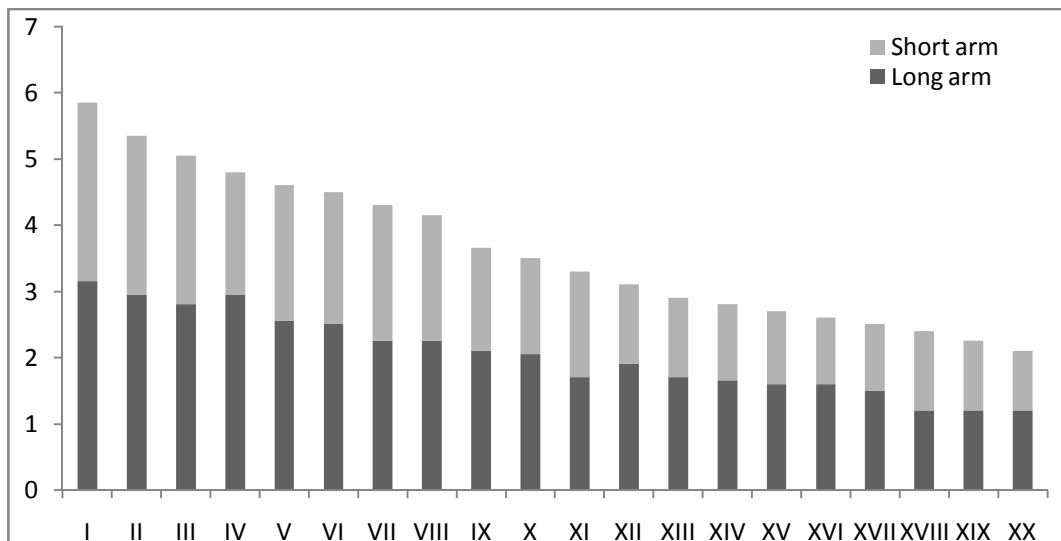


Figure 1. Idiograph of *B. prionitis* Linn.

Table 1. Type of chromosomes in *B. prionitis* Linn.

Type of chromosome	Description
Type A (Chromosome I)	A pair of long chromosomes (5.85 μ m) with median centromere (m). This is the longest pair
Type B (Chromosome II - VIII)	7 pairs of long chromosome (5.35-4.15 μ m) with median centromere (m)
Type C (Chromosome IX-XX)	12 pairs of short chromosome (3.65-2.05 μ m) with median centromere (m)

Table 2. Karyotype analysis of *B. prionitis* Linn.

Chromosome pair	Long arm (l) (μ m)	Short arm (s) (μ m)	Total length (c) (μ m)	'd' value (l-s) (μ m)	'r' value l/s (μ m)	'i' value s/c x 100	Centromeric position	Type
I	3.15 \pm 0.30	2.70 \pm 0.11	5.85 \pm 0.41	0.45	8.50	46.15	m	A
II	2.95 \pm 0.34	2.40 \pm 0.28	5.35 \pm 0.34	0.55	7.08	44.85	m	B
III	2.80 \pm 0.00	2.25 \pm 0.10	5.05 \pm 0.10	0.55	6.3	44.55	m	B
IV	2.95 \pm 0.55	1.85 \pm 0.55	4.80 \pm 0.16	1.10	5.45	38.54	m	B
V	2.55 \pm 0.47	2.05 \pm 0.19	4.60 \pm 0.23	0.50	5.22	44.56	m	B
VI	2.50 \pm 0.19	2.00 \pm 0.54	4.50 \pm 0.20	0.50	5.00	44.44	m	B
VII	2.25 \pm 0.19	2.05 \pm 0.10	4.30 \pm 0.25	0.20	4.61	47.67	m	B
VIII	2.25 \pm 0.19	1.90 \pm 0.25	4.15 \pm 0.34	0.35	4.27	45.78	m	B
IX	2.10 \pm 0.34	1.55 \pm 0.37	3.65 \pm 0.10	0.55	3.25	42.46	m	C
X	2.05 \pm 0.25	1.45 \pm 0.19	3.50 \pm 0.11	0.60	2.97	41.42	m	C
XI	1.70 \pm 0.11	1.60 \pm 0.00	3.30 \pm 0.11	0.10	2.72	48.48	m	C
XII	1.90 \pm 0.38	1.20 \pm 0.28	3.10 \pm 0.11	0.70	2.28	38.70	m	C
XIII	1.70 \pm 0.20	1.20 \pm 0.28	2.90 \pm 0.11	0.50	2.04	41.37	m	C
XIV	1.65 \pm 0.30	1.15 \pm 0.30	2.80 \pm 0.00	0.50	1.89	41.07	m	C
XV	1.60 \pm 0.16	1.10 \pm 0.11	2.70 \pm 0.11	0.50	1.76	40.74	m	C
XVI	1.60 \pm 0.23	1.00 \pm 0.23	2.60 \pm 0.00	0.60	1.60	38.46	m	C
XVII	1.50 \pm 0.11	1.00 \pm 0.00	2.50 \pm 0.11	0.50	1.50	40.00	m	C
XVIII	1.20 \pm 0.00	1.20 \pm 0.00	2.40 \pm 0.00	0.00	1.44	50.00	m	C
XIX	1.20 \pm 0.00	1.05 \pm 0.10	2.25 \pm 0.10	0.15	1.26	46.66	m	C
XX	1.2 \pm 0.16	0.90 \pm 0.20	2.05 \pm 0.10	0.30	1.08	43.90	m	C

DISCUSSION

The species was found to be diploid with $2n = 40$. The karyotype was found to be moderately symmetrical (2b) as per Stebbins [12] classification and also in the sense that of the twenty chromosome pairs, 8 are large and 12 are relatively small with median centromere. Although Ranganath and Krishnappa [13] reported metacentric and sub metacentric chromosomes for *B. prionitis*. In our studies, all chromosomes were found to be metacentric. The total chromosome length of haploid set was observed to be 72.35 μ .

CONCLUSION

Barleria prionitis shows diploid chromosome number forty and karyotype is moderately symmetrical whereas chromosomes are metacentric.

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