

Karyomorphological Studies on *Saintpaulia teitensis* (Gesneriaceae) from Taita Hills in Kenya*

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Introduction

Saintpaulia teitensis B.L. Burtt is a member of Gesneriaceae growing wild in only Taita Hills in Kenya and was described in 1958.

Chromosome numbers of *Saintpaulia* were previously reported by many authors (Sugiura 1931, 1936, Fussell 1958, Ratter 1963, Milne 1975, Sera & Karasawa 1984). Ratter (1963) reported that chromosome number of *S. teitensis* was $2n=30$, but the karyotype of this species has never been clarified yet. The author examined somatic chromosomes of *S. teitensis* in order to reveal the karyotype.

This paper deals with karyomorphological characteristics of *S. teitensis*.

Materials and methods

A material used for the observation was a plant propagated by leaf cutting from a leaf of a clone which had been replanted in 1985 from the natural habitat and cultivated to have been conserved in the E.A. Herbarium of National Museum of Kenya.

Somatic chromosomes were observed in growing root tips by the aceto-orcein squash method as in Sera and Karasawa (1984).

The results of the observations in the resting nuclei and somatic prophase chromosomes and the karyotype formulas at mitotic metaphase were described and classified according to Tanaka (1977, 1980). The description and the classification of the individual chromosome were according to Levan et al. (1964) when the mitotic metaphase chromosomes (Fig. 1, D) were basically aligned in descending order to analyse the karyotype (Fig. 1, E, Table 1).

Results and discussion

The chromosome number was $2n=30$ at mitotic prophase and metaphase which confirmed the previous

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report (Ratter 1963).

The chromosomes at resting stage were observed as lightly-stained numerous chromomeric granules, fibrous threads scattered throughout the nucleus and conspicuous chromatin blocks (Fig. 1, B). The chromatin blocks showed about 23 chromocentric bodies which varied in diameter of the long axis from 0.3–0.7 μm and rod- or round-shaped with smooth surface. Thus the chromosome feature at resting stage was regarded as the intermediate type between a rod prochromosome type and a round prochromosome type (Tanaka 1977).

All of the $2n=30$ chromosomes at mitotic prophase had early condensed segments in the proximal regions which differentiated clearly to late condensed segments.

The $2n=30$ chromosome set at mitotic metaphase showed a gradual degradation in length from the longest (1.8 μm) to the shortest (1.0 μm). Among the 30 chromosomes of the complement, eight (Nos. 7–10, 19, 20, 25, 26) were submedian centromeric with arm ratios varying between 2.0 and 2.6. The other 22 chromosomes were median centromeric with arm ratios varying between 1.0 and 1.2. Two chromosomes (Nos. 13, 14) had conspicuous satellites at the terminal regions of their short arms.

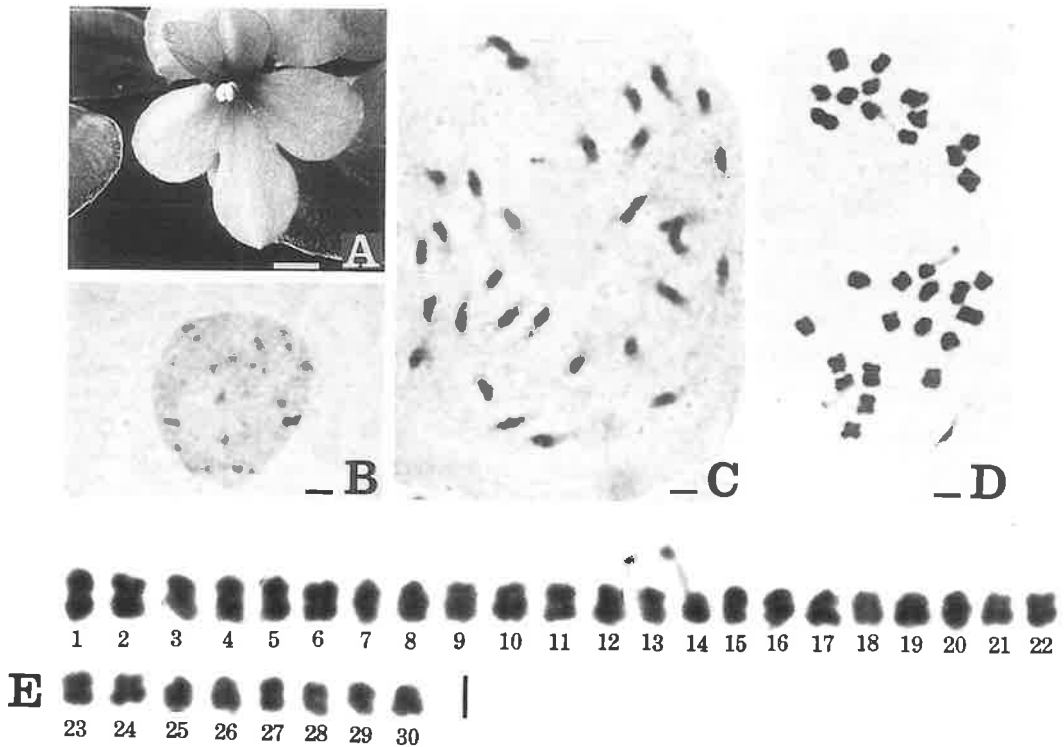


Fig. 1. *Saintpaulia teitensis*, $2n=30$. A, a flower. B, chromosomes at resting stage. C, chromosomes at mitotic prophase. D and E, chromosomes at mitotic metaphase. Bars indicate 5 mm in A and 1.5 μm in B-E.

The $2n = 30$ chromosome complements at mitotic metaphase showed a gradual karyotype due to a variability in chromosome length and a symmetric karyotype due to arm ratio.

The karyotype was clarified in eight species of the genus *Saintpaulia* (Sera & Karasawa 1984). Although *S. teitensis* showed almost the same karyotype as those of these eight species of the genus, it was different from them in having two conspicuous satellites.

Summary

1. *Saintpaulia teitensis* was karyomorphologically investigated.
2. The chromosome number was counted to be $2n=30$ which confirmed the previous report.
3. *S. teitensis* showed the intermediate type between a rod prochromosome type and a round prochromosome type at resting stage. All of the $2n=30$ chromosomes at mitotic prophase had early condensed segments in the proximal regions.
4. The karyotype at mitotic metaphase was gradual due to chromosome length and symmetric due to arm ratio.
5. *S. teitensis* showed almost the same karyotype as those of the other eight species of the genus except for having two conspicuous satellites.

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摘 要

1. セントポーリア テイテンシスにおいて核形態学的観察を行った。
2. 本種の染色体数 $2n=30$ を算定し、以前の報告を確認した。
3. 本種は、静止期において、棒形前染色体型と球形前染色体型の中間型を示した。体細胞分裂前期の30個の染色体全ては、動原体基部に早期凝縮部を持っていた。
4. 体細胞分裂中期の核型は、染色体の長さに関し勾配的で、腕比に関して対称的であった。
5. 本種の核型は、本属の他の8種と殆ど同じであったが、明瞭な2個の付随体を持つ点で異なっていた。

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Table 1. Measurements of somatic chromosomes of *Saintpaulia teitensis* at mitotic metaphase, $2n=30$

Chromosome	Length (μm)	Relative length	Arm ratio	Form
1	$0.9 + 0.9 = 1.8$	5.0	1.0	m
2	$0.7 + 0.8 = 1.5$	4.2	1.1	m
3	$0.7 + 0.8 = 1.5$	4.2	1.1	m
4	$0.7 + 0.8 = 1.5$	4.2	1.1	m
5	$0.7 + 0.7 = 1.4$	3.9	1.0	m
6	$0.7 + 0.7 = 1.4$	3.9	1.0	m
7	$0.4 + 0.9 = 1.3$	3.6	2.2	sm
8	$0.4 + 0.9 = 1.3$	3.6	2.2	sm
9	$0.4 + 0.9 = 1.3$	3.6	2.2	sm
10	$0.4 + 0.8 = 1.2$	3.3	2.0	sm
11	$0.6 + 0.7 = 1.3$	3.6	1.1	m
12	$0.6 + 0.7 = 1.3$	3.6	1.1	m
13	$0.2 + 0.4 + 0.6 = 1.2^*$	3.3	1.0	m
14	$0.3 + 0.3 + 0.6 = 1.2^*$	3.3	1.0	m
15	$0.5 + 0.6 = 1.1$	3.1	1.2	m
16	$0.5 + 0.6 = 1.1$	3.1	1.2	m
17	$0.5 + 0.6 = 1.1$	3.1	1.2	m
18	$0.5 + 0.6 = 1.1$	3.1	1.2	m
19	$0.3 + 0.8 = 1.1$	3.1	2.6	sm
20	$0.3 + 0.8 = 1.1$	3.1	2.6	sm
21	$0.5 + 0.5 = 1.0$	2.8	1.0	m
22	$0.5 + 0.5 = 1.0$	2.8	1.0	m
23	$0.5 + 0.5 = 1.0$	2.8	1.0	m
24	$0.5 + 0.5 = 1.0$	2.8	1.0	m
25	$0.3 + 0.7 = 1.0$	2.8	2.3	sm
26	$0.3 + 0.7 = 1.0$	2.8	2.3	sm
27	$0.5 + 0.5 = 1.0$	2.8	1.0	m
28	$0.5 + 0.5 = 1.0$	2.8	1.0	m
29	$0.5 + 0.5 = 1.0$	2.8	1.0	m
30	$0.5 + 0.5 = 1.0$	2.8	1.0	m

* chromosome with satellite