

松前公園(北海道) のシロバナタンポポの核型

メタデータ	言語: eng 出版者: 公開日: 2019-03-07 キーワード (Ja): キーワード (En): 作成者: メールアドレス: 所属:
URL	https://doi.org/10.24517/00053468

This work is licensed under a Creative Commons Attribution-NonCommercial-ShareAlike 3.0 International License.



Kyoko Sato^{1,3}, Hidetoshi Takeuchi² and Yoshikane Iwatsubo^{1*}: **Karyotype of *Taraxacum albidum* (Asteraceae) preserved in Matsumae Park, Hokkaido**
 佐藤杏子^{1,3}・竹内秀敏²・岩坪美兼^{1*}: 松前公園 (北海道) のシロバナタンポポの核型

Taraxacum albidum Dahlst., a perennial herb in the Asteraceae, thrives in central and western Honshu, Shikoku, Kyushu (Morita 1995) and Ryukyu (Shimabuku 1997) in Japan. In Hokkaido, however, this species is exclusively found in the area of Matsumae Park, in Matsumae, a town located on the farthest southern end of the Oshima-hanto Peninsula. *Taraxacum albidum* in this locality is thought to be introduced, and is preserved in Ryu-un-in Temple in Matsumae Park as an ornamental plant.

Taraxacum albidum has two polyploid forms: tetraploids with $2n = 32$ chromosomes distributed in Kyushu; and pentaploids with $2n = 40$ chromosomes, distributed in Honshu, Shikoku, Kyushu and Ryukyu (Sato et al. 2011). The pentaploids have two forms: $2n = 40 = 3M+32m+2m_{sc}+3sm$ (Type I) and $2n = 40 = 4M+31m+1m^{sc}+2m_{sc}+1sm+1sm^{sc}$ (Type II), whereas tetraploids show a uniform karyotype: $2n = 32 = 26m+2m^{sc}+4m$.

In this report, we present the karyotype of *T. albidum* preserved in Matsumae Park in Matsumae Town, Hokkaido.

Materials and methods

The present study utilized two *T. albidum* plants, which were grown from germinated seed collected in Matsumae Park.

Karyotypes were determined from meristematic cells of root tips subjected to the ordinal squash technique. Newly formed root tips sprouting from the cultivated plant were collected, pretreated in 2 mM 8-hydroxyquinoline at room temperature (ca. 25°C) for 1–1.5 h, and kept at 5°C for 15 h. The root tips were fixed in a mixture of glacial acetic acid and ethyl alcohol (1:3) for 1 h, soaked in 1N hydrochloric acid at room temperature for 1 h, macerated in 1N hydrochloric acid at 60°C for 10 minutes, washed in tap water, and then stained in a drop of 2% lacto-propionic orcein on a slide glass. Chromosome forms were described according to the nomenclature proposed by Levan et al. (1964).

Results and discussion

Chromosome number for the examined sample of *T. albidum* was $2n = 40$ chromosomes (Fig. 1). The two plants examined had $2n = 40$ chromosomes and their karyotypes were almost the same. As shown in Fig. 2, the 40 chromosomes at metaphase ranged from 1.3 to 3.9 μm in length and 1.0 to 2.0 in arm ratio, and were divided into two groups: 38 metacentric chromosomes and two submetacentric chromosomes (Table 1). Out of them, two metacentric chromosomes had a secondary constriction in the distal part of the long arm. Total length of the somatic complement was 87.0 μm and the longest chromosome was three times longer than shortest chromosome. The karyotype was formulated as $2n = 40 = 2M+34m+2m_{cs}+2sm$, which corresponded with the Type I for pentaploid ($2n = 40$) *T. albidum* reported in Sato et al. (2011).

In conclusion, this study showed that *T. albidum* preserved in Matsumae Park is a Type I pentaploid ($2n = 40$).

References

- Levan, A., Fredga, K. and Sandberg, A. A. 1964. Nomenclature for centromeric position on chromosomes. *Hereditas* **52**: 201–220.
- Morita, T. 1995. *Taraxacum*. Iwatsuki, K., Yamazaki, T., Boufford, D. E. and Ohba, H. (eds). *Flora of Japan* vol. IIIb. Angiospermae, Dicotyledoneae, Sympetalae (b). pp. 7–13. Kôdansha, Tokyo.
- Sato, K., Yamazaki, T. and Iwatsubo, Y. 2011. Cytogeography of *Taraxacum albidum* (Asteraceae) in



Fig. 1. Photograph of somatic metaphase chromosomes of *Taraxacum albidum* with $2n = 40$ preserved in Matsumae Park, which were grown from seeds originally collected from Ryu-un-in temple. Bar: 5 μ m.

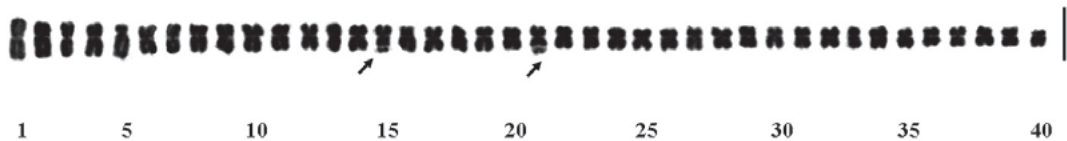


Fig. 2. Karyotype of somatic metaphase of *Taraxacum albidum* preserved in Matsumae Park. Bar: 5 μ m.

Japan. Cytologia **76**: 201-212.

Shimabuku, K. 1997. Check list vascular flora of Ryukyu Islands Revised ed. pp. 582-583. Kyushu Univ. Press, Fukuoka. (in Japanese)

摘 要

北海道松前町の松前公園・龍雲院にはシロバナタンポポが生育している。シロバナタンポポは本州（関東・北陸以西）、四国、九州に自生し、東北以北では松前公園だけに存在することから移入されたと考えられている。

シロバナタンポポには、四倍体（ $2n=32$ ）と五倍体（ $2n=40$ ）があり、五倍体には核型の異なる2型（Type I, Type II）が存在することが知られていることから、松前公園のシロバナタンポポがどのタイプかを明らかにするために、種子から育てた2個体について染色体観察を行った。

その結果、松前公園のシロバナタンポポは五倍体（ $2n=40$ ）であり、核型はSato et al. (2011) で報告し

Table 1. Measurements at somatic metaphase chromosomes of 5x *Taraxacum albidum*

No.	Length (μm)	Total (μm)	Arm ratio	Form
1	1.8 + 2.1	3.9	1.2	m
2	1.4 + 1.8	3.2	1.3	m
3	1.4 + 1.8	3.2	1.3	m
4	1.3 + 1.7	3.0	1.3	m
5	1.0 + 2.0	3.0	2.0	sm
6	1.3 + 1.4	2.7	1.1	m
7	1.2 + 1.4	2.6	1.2	m
8	1.0 + 1.5	2.5	1.5	m
9	1.2 + 1.3	2.5	1.1	m
10	1.0 + 1.4	2.4	1.4	m
11	0.9 + 1.3	2.2	1.4	m
12	0.9 + 1.3	2.2	1.4	m
13	0.9 + 1.3	2.2	1.4	m
14	1.1 + 1.1	2.2	1.0	M
15	0.9 + 1.0 + 0.3	2.2	1.4	m
16	0.8 + 1.4	2.2	1.8	sm
17	1.1 + 1.1	2.2	1.0	M
18	0.8 + 1.3	2.1	1.6	m
19	0.8 + 1.3	2.1	1.6	m
20	0.9 + 1.1	2.0	1.2	m
21	0.8 + 0.8 + 0.4	2.0	1.5	m
22	0.9 + 1.1	2.0	1.2	m
23	0.9 + 1.0	1.9	1.1	m
24	0.9 + 1.0	1.9	1.1	m
25	0.9 + 1.0	1.9	1.1	m
26	0.9 + 1.0	1.9	1.1	m
27	0.9 + 1.0	1.9	1.1	m
28	0.8 + 1.1	1.9	1.4	m
29	0.8 + 1.1	1.9	1.4	m
30	0.8 + 1.1	1.9	1.4	m
31	0.8 + 1.1	1.9	1.4	m
32	0.8 + 1.1	1.9	1.4	m
33	0.8 + 1.1	1.9	1.4	m
34	0.8 + 1.0	1.8	1.3	m
35	0.8 + 1.0	1.8	1.3	m
36	0.8 + 1.0	1.8	1.3	m
37	0.8 + 0.9	1.7	1.1	m
38	0.7 + 0.9	1.6	1.3	m
39	0.7 + 0.8	1.5	1.1	m
40	0.5 + 0.8	1.3	1.6	m

た五倍体の2つの型の内のType Iであることが判った。

(¹ Graduate School of Science and Engineering, University of Toyama, 3190 Gofuku, Toyama 930-8555, Japan: iwatsubo@sci.u-toyama.ne.jp (*corresponding author); ² Matsumae Public Office, Fukuyama 248, Matsumae Town, Hokkaido 049-1592, Japan; ³ Present address: Akada 631-20, Toyama 939-8064, Japan ¹〒930-8555 富山市五福3190 富山大学大学院理工学教育部; ²〒049-1592 北海道松前郡松前町福山248 松前町役場; ³〒939-8064 富山市赤田631-20)

(Received December 10, 2011; accepted January 30, 2012)