

Katsuhiko KONDO\*: **Chromosome numbers  
of some *Drosera* taxa\*\***

近藤勝彦\*: モウセンゴケ属 3種, 1雑種の染色体数\*\*

A classic in cytology has been Rosenberg's early studies (1903, 1904, 1909) of *Drosera* material for observations of meiotic behavior in hybrids of Angiosperms. Shimamura (1941) proved that Rosenberg used Japanese *Drosera obovata* Mert. et Koch which is the natural hybrid of *D. longifolia* L. and *D. rotundifolia* L. Wood (1955) in his studies of some North American *Drosera* material applied previously-reported evidence of meiotic behavior in hybrids of higher plants to his *Drosera* studies, and indicated that *Drosera anglica* Huds. might be of hybrid origin. Chromosome numbers of various *Drosera* taxa have been reviewed and reported by Kondo (1966, 1969, 1970, 1971a, 1971b, 1971c). Since chromosome counts are of great biosystematic importance, many more records of chromosome numbers are necessary for an understanding of the genus *Drosera*.

The chromosome numbers of three species and one artificial hybrid of *Drosera* are here reported: chromosome counts for one species and one artificial hybrid are given for the first time; and two counts verify counts previously reported in the literature.

**Materials and Methods** Materials used in this study were collected and sent from the following sources:

*Drosera menziesii* R. Br.—King's Park and Botanic Garden, Perth, W. A., Australia (Seed stock No. 2083; courtesy of Dr. D. E. Schnell, Statesville, N. C., U. S. A.).

*Drosera peltata* Smith—Mt. Keira, N. S. W., Australia (courtesy of Mr. B. Whitehead, Dapto, N. S. W., Australia).

*Drosera spathulata* Labill. (Kansai-type)—Mt. Shinoda, Osaka Pref., Japan (courtesy of Mr. I. Kusakabe, Tokyo, Japan).

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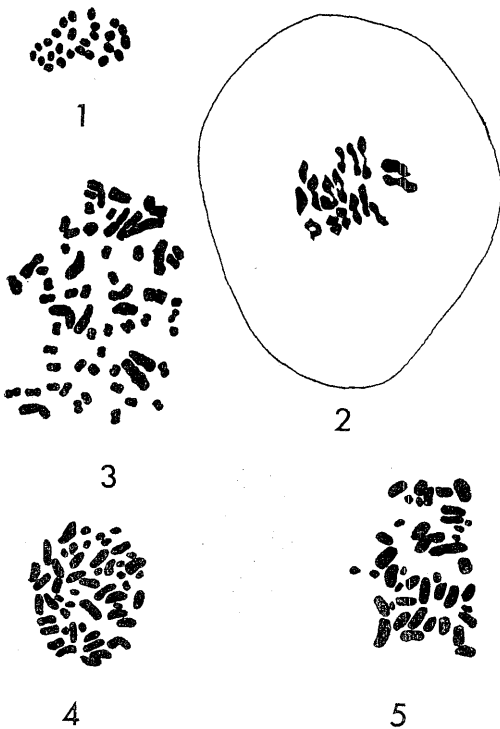
\*\* The author expresses his appreciation to Dr. A. J. Sharp, The University of Tennessee, for reading the manuscript.

*Drosera* × 'Nagamoto' (*D. longifolia* × *D. spathulata*)—cultivation (courtesy of Mr. I. Kusakabe, Tokyo, Japan). A hybrid, horticulturally named *D.* × 'Nagamoto', was made by Mr. Jiro Nagamoto on June 24, 1971 (pollination date). The parents of the hybrid were *Drosera longifolia* as the maternal parent from Hokkaido and *D. spathulata* as the paternal parent from Mt. Shinoda, Osaka.

Root tips were fixed in regular Farmer's fluid. Flower buds were fixed in regular Carnoy's solution. Chromosome counts were made by the aceto-carmine squash method.

#### Results and Discussion

Observations were made of the chromosome numbers of three species and one hybrid thus prepared. *Drosera menziesii* has the somatic chromosome number,  $2n=26$  (Fig. 1). All the somatic chromosomes of the species are almost of the same size and very small. *Drosera menziesii* is placed in Subgenus *Ergaleium* DC., Section *Polyteltes* Diels according to Diels (1906). The meiotic chromosome number of *Drosera peltata* Smith was counted as  $n=16$  (Fig. 2). The chromosomes were all bivalents. The chromosome number of *D. peltata*,  $2n=40$ , was previously reported by Venkatasubban (1950) using Indian material and by Kondo (1969) using



Figs. 1, 3, 4 and 5. Chromosomes in root tip cells of: Fig. 1. *Drosera menziesii* R. Br. ( $2n=26$ ); Fig. 3. *Drosera spathulata* Labill. ( $2n=60$ ); Fig. 4. *Drosera* × 'Nagamoto' ( $2n=50$ ); Fig. 5. *Drosera* × 'Nagamoto' ( $2n=43$ ). Fig. 2. Chromosomes in pollen mother-cell of *Drosera peltata* Smith ( $n=16$ ). ×ca. 1350.

Japanese material. Thus, the chromosome number of this *D. peltata* is different from that of Australian *D. peltata*. Kress (1970) reported the chromosome number of *D. auriculata* Backh. ex Planch. to be  $2n=32$  which is same as that of *D. peltata* counted at this time. *Drosera auriculata* is closely related to *D. peltata*, and both are placed in same subgenus and section as is *D. menziesii* according to Diels (1906). The chromosome numbers of those three species indicate that *D. auriculata* and *D. peltata* are closely related, but these two species and *D. menziesii* might be less related.

*Drosera spathulata* (Kansai-type) showed the somatic chromosome number to be  $2n=60$  (Fig. 3). Karyotype of the species is:  $K(2n=60)=18L+42S$ ; L means large chromosomes, and S means small chromosomes. Kondo (1971b) reviewed the *Drosera spathulata* complex which has five different chromosome numbers;  $2n=20, 40, 50, 60, 80$ . In the present investigation, individuals from Osaka, which is called the Kansai-type, showed the same chromosome number  $2n=60$  as those from Aichi Prefecture, Japan, previously reported by Kondo (1966, 1969).

An artificial hybrid, *Drosera* × '*Nagamoto*' showed two different chromosome numbers in two individuals: one (Ind. No. NA-1) was  $2n=50$  (Fig. 4), and the other one (Ind. No. NA-2) was  $2n=43$  (Fig. 5). The former karyotype is  $K(2n=43)=30L+13S$ , and the latter one is  $K(2n=50)=30L+20S$ . According to the *Drosera*-type of hybridization (Shimamura, 1941), *Drosera* × '*Nagamoto*' should always have the chromosome number  $2n=50$  if meiotic divisions of this hybrid is normal and the chromosomes in meiosis are equally divided physically, since the chromosome number of one parent of this hybrid, *D. longifolia*,  $2n=40$  and that of the other parent, *D. spathulata* (Kansai-type), is  $2n=60$  (the parent *D. spathulata* came from the same population as that of above *D. spathulata* studied). Thus, the unusual chromosome number of one individual (Ind. No. NA-2) of *D.* × '*Nagamoto*' ( $2n=43$ ) might be due to hybrid meiotic irregularity. This kind of irregularity in chromosome number might occur sometimes (Wood, 1955). A karyotype comparison between the two individuals indicate that they have same number of large chromosomes, thirty. More observations of meiosis in this hybrid should be made before further discussion is attempted. A distinguishing characteristic for this hybrid is the absence of winter buds; *Drosera longifolia* does have winter buds but *D. spathulata* does not.

Another characteristic is that the stipule is five-lobed or more. In contrast, *Drosera spathulata* usually has three-lobed stipules. Plant characters, especially leaf-blades morphology, is usually intermediate between both parents.

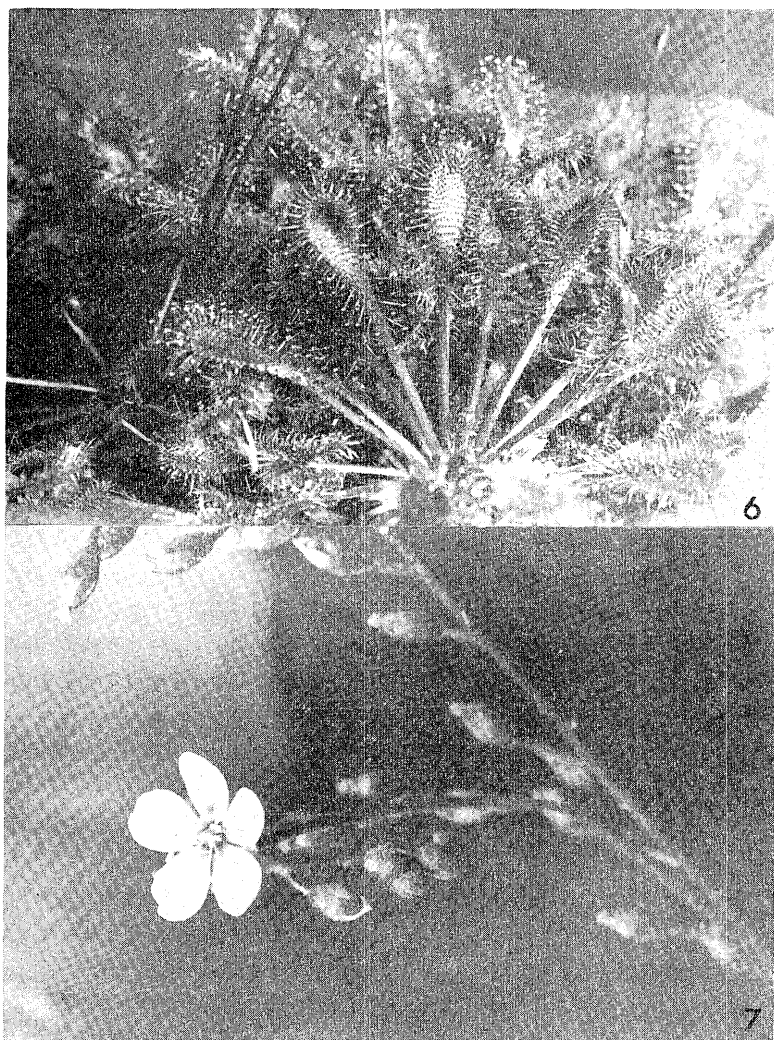


Fig. 6-7. *Drosera* × '*Nagamoto*' × ca. 2. Fig. 6. Foliar characters of *D.* × '*Nagamoto*'. Fig. 7. Floral characters of *D.* × '*Nagamoto*'. (Courtesy of Mr. I. Kusakabe)

(Fig. 7). Scapes are green to red colored, and 20 to 30 cm long. Flowers are about 10 mm diameter (Fig. 6). Petals are light red to light pink in color. Flower morphology is very similar to that of *D. spathulata* instead of being intermediate between the parents. This hybrid combination is reported here for the first time.

#### Literature cited

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モウセンゴケ属3種1雑種の染色体数ならびに核型を調べた。*Drosera menziesii* は

$2n=26$  の染色体数をもっており、それらの染色体はすべて同じ形態を示し、かつ大変小さかった。オーストラリア産のイシモチソウ (*Drosera peltata*) の染色体数は、 $2n=40$  をもつ日本産やインド産のものとは異なり、 $n=16$  であった。関西型コモウセンゴケ (*Drosera spathulata*) から  $K(2n=60)=18L+42S$  がえられた。染色体数は愛知県産コモウセンゴケと同数である。日本で園芸栽培され始めたナガモトモウセンゴケ (*Drosera* × 'Nagamoto') といわれる雑種はナガバノモウセンゴケ (*Drosera longifolia*) を母親に上記関西型コモウセンゴケを父親として、永本二郎氏により作出されたものである。この雑種の核型を調べたところ、 $K(2n=50)=30L+20S$  と、 $K(2n=43)=30L+13S$  という 2 つのものが得られた。

□ 中国科学院植物研究所主編：中国高等植物図鑑 Iconographia Cormophytorum Sinicorum 第 1 冊，第 2 冊。中国科学出版社，1972 年 2 月発行，第 1 冊 5.20 元，第 2 冊 5.60 元，A5 版。中国のコケ類以上の高等植物の図鑑である。解説によると、中国にはコケ類以上の高等植物は 3 万種知られているが、その内 7500 種を図説する計画で、第 1 冊，第 2 冊が出版された。第 1 冊はコケ類 212 図，シダ類 356 図，裸子植物 109 図，被子植物の離弁花類をエングラの旧版の順序でクスノキ科まで 1054 図。第 2 冊はケン科からミズキ科までの離弁花類の残りの全部 2224 図をのせ、用語の解説と科，属の検索がつけられている。印刷の体裁は牧野日本植物図鑑と似ていて、1 頁に 2 種類づつ図説されている。第 3 冊は合弁花類，第 4 冊は単子葉類が予定されている。

中国各地の植物系の研究所や大学が協力して編集したものである。今まで中国の図説類は、大型の詳細に画かれたすぐれたものがいくつかある。しかし大部すぎることで、地域的にすぎるため学術研究以外には使用しにくく、一般的なものは殆んどなかった。陳氏の中国樹木分類学も樹木だけの図鑑である。今回のものは草も含め、しかも中国植物のほぼ 4 分の一が納められているので貴重なものである。日頃名前だけは書いていても図を見る機会がなかった中国固有の属や種が多数のせられているので見ていてもたのしい本である。

多量の図なのでかなり既存の本から引用された図がみうけられる。これらは出典まではあげなくとも、少くとも引用のもとになった原図の著者名位はあげておくべきものと思う。中には既存の原図をもとに書きかえたのでないかと思われるものもある。そのため記載文と図とは別の植物でないかと考えられるものがある (例 *Viola vaginata*)。牧野図鑑から引用したものは細部が省略されて粗な図になっているなど欠点もあるが、とにかく便利な価値の高い本が出版されたもので、早く完成されることが望まれる。日本では 2 冊 3,240 円で販売されている。北京で購入して、早速情報を伝えて下さった山田和子氏に感謝する。

(山崎 敬)