

# Yoshikane Iwatsubo<sup>1</sup>, Tetsuya Kawasaki<sup>2</sup> and Naohiro Naruhashi<sup>1</sup> : **Chromosome numbers of 193 cultivated taxa of *Prunus* subg. *Cerasus* in Japan**

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## Abstract

Chromosome counts of 193 taxa including wild taxa in the *Prunus* subg. *Cerasus* in Japan were reported. Among 193 taxa, the chromosome counts of 148 taxa were determined for the first time. The taxa studied included 161 diploids, 30 triploids, one tetraploid, and one hexaploid. This study showed that the majority of the cultivated *Prunus* subg. *Cerasus* taxa of Japan are diploid.

**Key words** : chromosome number, cultivar, Japan, *Prunus* subg. *Cerasus*, Rosaceae.

*Prunus* L. (Prunoideae, Rosaceae), a diverse group constituting of deciduous and evergreen trees and shrubs, is distributed in the temperate zones and tropical mountains, and comprises more than 200 species divided into seven subgenera being recognized in sensu stricto as discrete genera : *Prunus* L., s. str., *Cerasus* Mill., *Armeniaca* Mill., *Persica* Mill., *Amygdalus* L., *Padus* Mill. and *Laurocerasus* Duhamel (Mabberley 1997). At present, including *Prunus* taxa introduced from China and other countries, 25 species (Ohwi and Kitagawa 1992) and hundreds of cultivated taxa grown chiefly as garden flowers (Nihon Hana no Kai 1982) are found in Japan.

In *Prunus*, various chromosome numbers,  $2n=16, 17, 18, 19, 24, 25, 32, 34, 36, 40, 48, 64, 144$ , and so on, were known (Fedorov 1969). In Japan, the first cytological study of this genus gave  $2n=16$  for *P. ×yedoensis* 'Yedoensis' (Ishikawa 1916). Thereafter,  $2n=16, 24, 25$  and  $32$  were reported for the *Prunus* taxa in Japan (Okabe 1927, 1928 ; Sax 1931 ; Tanaka and Oginuma 1975 ; Oginuma and Tanaka 1976 ; Nishikawa 1985 ; Oginuma 1987 a,b, 1988, 1993 ; Somego 2000, and so on). The majority of the cultivated *Prunus* taxa in Japan, however, remained up to now unexamined. We present here somatic chromosome counts of 193 taxa including wild taxa

in the subg. *Cerasus*.

## Materials and methods

Chromosome counts were made from somatic cells undergoing mitosis in the meristems of leaf buds collected from the plants preserved both in the Tama Forest Science Garden at Hachioji in Tokyo Metropolis and in the Yuki Experimental Station of the Flower Association of Japan (Nihon Hana no Kai), Ibaraki Prefecture. After being collected, the leaf buds were readily pretreated in a 2 mM 8-hydroxyquinoline solution for a few hours at room temperature and then at ca. 5°C for about 15 h. They were then fixed and kept in Newcomer's fluid at room temperature until used. After being immersed in 1 N HCl for a few hours, the leaf buds were macerated in 1 N HCl at 60°C for 10 minutes, and then washed in tap water. They were stained in 1.5% lacto-propionic orcein, and the usual squashing method was applied for the examination of chromosomes. Voucher specimens are kept in TNS.

## Results and discussion

Including wild taxa, a total of 193 taxa in the *Prunus* subg. *Cerasus* found in Japan were used for the chromosome study. A list of the taxa studied, the number of plants examined, and their voucher specimens are presented in Table

Table 1. List of studied taxa of *Prunus* subg. *Cerasus*, Japanese name, number of individuals examined, voucher specimen numbers, and present and previous chromosome counts

Taxon	Japanese name	Present count (2n)	No. of plants examined	Voucher number	Previous report	Reference
<i>P. apetala</i> (Siebold et Zucc.) Franch. et Sav. var. <i>pilosa</i> (Koidz.) E.H.Wilson 'Multipetala'	Hinagiku-zakura (雛菊桜)	16	1	Kawasaki 5243 <sup>r</sup>	16	Oginuma and Tanaka 1976; Oginuma 1987 a
<i>P. apetala</i> (Siebold et Zucc.) Franch. et Sav. var. <i>monticola</i> Kawas. et H. Koyama × <i>P. × parvifolia</i> (Matsum.) Koehne	Shikizaki-choji-zakura (四季咲丁香桜)	16	1	Kawasaki 5195 <sup>r</sup>		
<i>P. campanulata</i> Maxim.	Kan-hi-zakura (寒緋桜)	16	1	Kawasaki 7243 <sup>r</sup>	16	Okabe 1927, 1928 (as <i>P. cerasoides</i> var. <i>campanulata</i> ); Oginuma and Tanaka 1976; Oginuma 1987 a, b; Somego 2000
'Ryukyu-hizakura'	Ryukyu-hizakura (琉球緋桜)	16	1	Kawasaki 5242 <sup>r</sup>		
( <i>P. campanulata</i> Maxim. × <i>P. incisa</i> Thunb.) 'Okame'	Okame (オカメ)	16	1	Kawasaki 5216 <sup>r</sup>		
<i>P. campanulata</i> Maxim. × <i>P. × heio-zakura</i> Ohwi	Hatsumiyo-zakura (初御代桜)	24	1	Kawasaki 5214 <sup>r</sup>		
<i>P. × chichibuensis</i> H.Kubota et Moriya	Chichibu-zakura (秩父桜)	16	1	Kawasaki 5204 <sup>r</sup>		
var. <i>uyekii</i> H.Kubota	Ogurayama-zakura (小倉山桜)	16	1	Kawasaki 5205 <sup>r</sup>		
<i>P. × furuseana</i> Ohwi	Minobu-zakura (身延桜)	16	1	Kawasaki 5256 <sup>r</sup>		
<i>P. × ganman-zakura</i> H.Kubota nom. nud.	Ganman-zakura (含満桜)	16	1	Kawasaki 5260 <sup>r</sup>		
<i>P. incisa</i> Thunb. 'Fujikikuzakura'	Fuji-kiku-zakura (富士菊桜)	16	1	Kawasaki 7245 <sup>r</sup>		
'Kojou-no-mai'	Kojō-no-mai (湖上の舞)	16	1	Kawasaki 5253 <sup>r</sup>		
'Midono-yaе'	Midono-yaе (水土野八重)	16	1	Kawasaki 7247 <sup>r</sup>		
'Oshidori'	Oshidori-zakura (鶯鶯桜)	16	2	Kawasaki 7253 <sup>r</sup> Kawasaki 7283 <sup>r</sup>		
'Yamadei'	Midori-zakura (緑桜)	16	1	Kawasaki 3859 <sup>r</sup>		
var. <i>globosa</i> Kawas.	Amedama-zakura (船玉桜)	24	2	Kawasaki 5106 <sup>r</sup> Kawasaki 5150 <sup>r</sup>		
var. <i>kinkiensis</i> (Koidz.) Ohwi	Kinki-mame-zakura (近畿豆桜)	16	1	Kawasaki 5211 <sup>r</sup>	16	Oginuma and Tanaka 1976; Oginuma 1987 a
'Kumagaizakura'	Kumagai-zakura (熊谷桜)	16	1	Kawasaki 5210 <sup>r</sup>		
( <i>P. incisa</i> Thunb. × <i>P. lannesiana</i> (Carrière) E.H.Wilson var. <i>speciosa</i> (Koidz.) Makino) 'Umineko'	Umineko (海猫)	16	1	Kawasaki 5197 <sup>r</sup>		
<i>P. incisa</i> Thunb. × <i>P. sp.</i>	Gotenba-zakura (御殿場桜)	16	1	Kawasaki 5114 <sup>r</sup>		

<i>P. incisa</i> Thumb. × <i>P. sp.</i>	Watanabe-zakura (渡辺桜)	16	1	Kawasaki 1464 <sup>y</sup>		
<i>P. × introrsa</i> Yagi ex Ohwi 'Introrsa'	Tsubaki-kanzakura (椿寒桜)	24	1	Kawasaki 5085 <sup>r</sup>	16	Somego 2000
	'Myoshoji'	24	2	Kawasaki 5217 <sup>y</sup> Kawasaki 7242 <sup>r</sup>		
<i>P. jamasakura</i> Siebold ex Koidz. 'Agrishi-kogikuzakura'	Agishi-kogiku-zakura (阿岸小菊桜)	16	1	Kawasaki 7279 <sup>r</sup>		
	'Gijozakura'	16	1	Kawasaki 4815 <sup>r</sup>		
'Goshinzakura'	Goshin-zakura (御信桜)	16	1	Kawasaki 5094 <sup>r</sup>		
	'Haguensis'	16	1	Kawasaki 6445 <sup>r</sup>		
'Heteroflora'	Keta-no-shiro-kiku-zakura (気多の白菊桜)	16	1	Kawasaki 7264 <sup>r</sup>		
	'Hiuchidani-kikuzakura'	16	1	Kawasaki 5111 <sup>y</sup>		
'Hiyoshizakura'	Hiuchidani-kiku-zakura (火打谷菊桜)	16	1	Kawasaki 5093 <sup>r</sup>		
	'Ichihara'	16	1	Kawasaki 1471 <sup>r</sup>		
'Iyo-usuzumi'	Ichihara-tora-no-o (市原虎の尾)	16	1	Kawasaki 5189 <sup>y</sup>		
	'Kenrokuen-kumagai'	16	1	Kawasaki 5227 <sup>r</sup>		
'Kinugasa'	Kinugasa (衣笠)	16	1	Kawasaki 5237 <sup>r</sup>		
	'Kotohira'	16	1	Kawasaki 5147 <sup>r</sup>		
'Nahohiana'	Konohana-zakura (木の花桜)	16	1	Kawasaki 5188 <sup>y</sup>		
	'Sanozakura'	16	1	Kawasaki 3841 <sup>y</sup>		
'Sunpu-zakura'	Sano-zakura (佐野桜)	16	1	Kawasaki 5112 <sup>y</sup>		
	'Yoro-zakura'	16	1	Kawasaki 5308 <sup>y</sup>		
'Zenshoji-kikuzakura'	Sunpu-zakura (駿府桜)	16	1	Kawasaki 5097 <sup>r</sup>		
	Yōrō-zakura (養老桜)	16	1	Kawasaki 5091 <sup>r</sup>		
cv.	Zenshoji-kiku-zakura (善正寺菊桜)	16	1	Kawasaki 7265 <sup>y</sup>		
	Sōdō-zakura (宗堂桜)	16	1	Kawasaki 7265 <sup>y</sup>		
<i>P. jamasakura</i> Siebold ex Koidz. 'Kenrokuen-kumagai' (♀) × <i>P. campanulata</i> Maxim. (♂)	Yokohama-hizakura (横浜緋桜)	16	1	Kawasaki 5212 <sup>y</sup>		
	<i>P. × kanzakura</i> Makino 'Izutaga-aka'	16	1	Kawasaki 5086 <sup>r</sup>	16	Oginuma and Tanaka 1976; Oginuma 1987 a
'Kanzakura'	Kan-zakura (寒桜)	16	1	Kawasaki 5086 <sup>r</sup>		

Table 1. (continued)

Taxon	Japanese name	Present count (2n)	No. of plants examined	Voucher number	Previous report	Reference
'Kawazu-zakura'	Kawazu-zakura (河津桜)	16	1	Kawasaki 6444 <sup>r</sup>	16	Somego 2000
'Oh-kanzakura'	Ō-kan-zakura (大寒桜)	16	1	Kawasaki 6448 <sup>r</sup>		
'Rubescens'	Shuzenji-kan-zakura (修善寺寒桜)	16	1	Kawasaki 7155 <sup>r</sup>		
<i>P. ×kobuku-zakura</i> Ohwi	Kobuku-zakura (子福桜)	16	1	Kawasaki 5261 <sup>v</sup>		
<i>P. ×koshiensis</i> Koidz.	Koshi-no-higan-zakura (越の彼岸桜)	24	1	Kawasaki 5192 <sup>r</sup>	24	Oginuma 1987 a,b (as <i>P. pendula</i> var. <i>koshiensis</i> ); Somego 2000
<i>P. lannestiana</i> (Carrière) E.H.Wilson 'Alboresea'	Fugenzō (普賢象)	16	1	Kawasaki 5167 <sup>r</sup>	16	Okabe 1927 (as <i>P. serrulata</i> 'Fugenzō'), 1928 (as <i>P. serrulata</i> f. <i>classica</i> ); Oginuma 1987 a
'Aratama'	Aratama (新珠)	16	1	Kawasaki 3837 <sup>v</sup>		
'Azuma-nishiki'	Azuma-nishiki (東錦)	16	1	Kawasaki 5087 <sup>r</sup>		
'Benigasa'	Benigasa (紅笠)	16	1	Kawasaki 3822 <sup>v</sup>		
'Beni-shigure'	Beni-shigure (紅時雨)	16	1	Kawasaki 3834 <sup>v</sup>		
'Beni-yutaka'	Beni-yutaka (紅豊)	24	1	Kawasaki 5110 <sup>v</sup>		
'Candida'	Ariake (有明)	24	1	Kawasaki 1400 <sup>r</sup>	24	Okabe 1927 (as <i>P. serrulata</i> 'Ariake'), 1928 (as <i>P. serrulata</i> f. <i>candida</i> )
'Chihara-zakura'	Chihara-zakura (千原桜)	16	1	Kawasaki 5081 <sup>r</sup>		
'Chrysanthemoides'	Kiku-zakura (菊桜)	16	1	Kawasaki 5131 <sup>v</sup>		
'Contorta'	Fukurokuju (福祿寿)	24	1	Kawasaki 1399 <sup>r</sup>	24	Okabe 1927 (as <i>P. serrulata</i> 'Fukurokuju'), 1928 (as <i>P. serrulata</i> f. <i>contorta</i> ); Oginuma 1987 a
'Eigenji'	Eigenji (永源寺)	16	1	Kawasaki 5158 <sup>v</sup>		
'Erecta'	Ama-no-gawa (天の川)	16	1	Kawasaki 5109 <sup>v</sup>	16	Okabe 1927 (as <i>P. serrulata</i> 'Ama-nogawa'), 1928 (as <i>P. serrulata</i> f. <i>erecta</i> )
'Fudanzakura'	Fudan-zakura (不斷桜)	16	1	Kawasaki 5078 <sup>r</sup>		
'Gioiko'	Gyoikō (御衣黄)	16	1	Kawasaki 5168 <sup>r</sup>	16	Okabe 1928 (as <i>P. serrulata</i> f. <i>tricolor</i> )
'Gosho-odora'	Gosho-nioi (御所匂)	16	1	Kawasaki 5103 <sup>r</sup>		

'Grandiflora'	Ukon (鬱金)	16	1	Kawasaki 5170 <sup>†</sup>	16	Okabe 1927 (as <i>P. serrulata</i> 'Ukon'), 1928 (as <i>P. serrulata</i> f. <i>luteo-virens</i> )
'Hakusan-ohtemari'	Hakusan-ohdemari (白山大手毬)	16	1	Kawasaki 1472 <sup>†</sup>		
'Hanagasa'	Hanagasa (花笠)	16	1	Kawasaki 3827 <sup>†</sup>		
'Hisakura'	Ichiyō (一葉)	16	1	Kawasaki 5182 <sup>†</sup>	16	Okabe 1928 (as <i>P. serrulata</i> f. <i>unifolia</i> )
'Hokuhou'	Hokuhō (北鵬)	24	1	Kawasaki 3829 <sup>†</sup>		
'Hotate'	Hotate (帆立)	16	1	Kawasaki 5163 <sup>†</sup>		
'Imose'	Imose (妹背)	16	1	Kawasaki 5160 <sup>†</sup>		
'Juzukakezakura'	Baigoji-juzukake-zakura (梅 護寺般若掛桜)	16	1	Kawasaki 5141 <sup>†</sup>		
'Kariginu'	Kariginu (狩衣)	24	4	Kawasaki 1445 <sup>†</sup> Kawasaki 7257 <sup>†</sup> Kawasaki 7258 <sup>†</sup> Kawasaki 7259 <sup>†</sup>		
'Kibune-uzu'	Kibune-uzu (貫船雲珠)	16	1	Kawasaki 5148 <sup>†</sup>		
'Kinashi-chigozakura'	Kinashi-chigo-zakura (鬼無 稚児桜)	16	1	Kawasaki 5157 <sup>†</sup>		
'Kirin'	Kirin (麒麟)	16	1	Kawasaki 5139 <sup>†</sup>	16	Okabe 1927 (as <i>P. serrulata</i> 'Kirin'), 1928 (as <i>P. serrulata</i> f. <i>atrorubra</i> )
'Kodaiji'	Kōdaiji (高台寺)	24	1	Kawasaki 5234 <sup>†</sup>		
'Kokesimidzu'	Kokeshimizu (苔清水)	16	1	Kawasaki 5236 <sup>†</sup>	16	Okabe 1927 (as <i>P. serrulata</i> 'Koke- shimidzu'), 1928 (as <i>P. serrulata</i> f. <i>angustipetala</i> )
'Komatsunagi'	Koma-tsunagi (駒繫)	24 <sup>1</sup>	1	Kawasaki 1190 <sup>†</sup>	24	Okabe 1927 (as <i>P. serrulata</i> 'Koma- tsunagi'), 1928 (as <i>P. serrulata</i> f. <i>komatsunagi</i> )
'Kongosan'	Kongōzan (金剛山)	16	1	Kawasaki 5233 <sup>†</sup>		
'Kouka'	Kōka (紅華)	16	1	Kawasaki 3835 <sup>†</sup>		
'Longipedunculata'	Hiyodori-zakura (鶯桜)	16	1	Kawasaki 5137 <sup>†</sup>		
'Matsumae'	Matsumae (松前)	16	1	Kawasaki 5183 <sup>†</sup>		
'Matsumae-aizen'	Matsumae-aizen (松前愛染)	16	1	Kawasaki 5146 <sup>†</sup>		
'Matsumae-benihigoromo'	Matsumae-beni-higoromo (松前紅緋衣)	16	1	Kawasaki 3824 <sup>†</sup>		
'Matsumae-hanazomei'	Matsumae-hanazomei (松前花 染衣)	16	1	Kawasaki 5184 <sup>†</sup>		

Table 1. (continued)

Taxon	Japanese name	Present count (2n)	No. of plants examined	Voucher number	Previous report	Reference
'Matsumae-hayazaki'	Matsumae-hayazaki (松前早咲)	24	2	Kawasaki 5113 <sup>y</sup> Kawasaki 5229 <sup>r</sup>		
'Matsumae-kazan-in'	Matsumae-kazan'in (松前花山院)	16	1	Kawasaki 3823 <sup>y</sup>		
'Matsumae-usubenikokomoe'	Matsumae-usubeni-kokomoe (松前薄紅九重)	16	1	Kawasaki 5162 <sup>y</sup>		
'Matsumae-usugasanesomei'	Matsumae-usugasane-somei (松前薄重染井)	16	1	Kawasaki 3828 <sup>y</sup>		
'Matsumae-yaekotobuki'	Matsumae-yaekotobuki (松前八重寿)	16	1	Kawasaki 5161 <sup>y</sup>		
'Mikurumakaisi'	Mikuruma-gaeshi (御車返し)	16	1	Kawasaki 1373 <sup>r</sup>	16	Okabe 1928 (as <i>P. serrulata</i> f. <i>diversiflora</i> )
'Mirabilis'	Ômura-zakura (大村桜)	16	1	Kawasaki 5175 <sup>r</sup>		
'Mitsukabizakura'	Mikkabi-zakura (三ヶ日桜)	16	1	Kawasaki 5100 <sup>r</sup>		
'Mollis'	Yôkihi (楊貴妃)	16	1	Kawasaki 1383 <sup>r</sup>		
'Multipetala'	Najima-zakura (名島桜)	16	1	Kawasaki 5144 <sup>y</sup>	16	Okabe 1928 (as <i>P. serrulata</i> f. <i>multi-petala</i> )
'Nigrescens'	Usuzumi (薄墨)	24	4	Kawasaki 5221 <sup>r</sup> Kawasaki 5222 <sup>r</sup> Kawasaki 5223 <sup>r</sup> Kawasaki 7261 <sup>y</sup>	25	Okabe 1928 (as <i>P. serrulata</i> f. <i>nigrescens</i> )
'Nobilis'	Edo (江戸)	16	1	Kawasaki 7246 <sup>y</sup>	16	Okabe 1927 (as <i>P. serrulata</i> 'Yedo'), 1928 (as <i>P. serrulata</i> f. <i>nobilis</i> )
'Ohta-zakura'	Ôta-zakura (太田桜)	16	1	Kawasaki 5095 <sup>r</sup>		
'Ojochin'	Ôjochin (大堤灯)	24	1	Kawasaki 5128 <sup>r</sup>	24	Okabe 1927 (as <i>P. serrulata</i> 'Ôjochin'), 1928 (as <i>P. serrulata</i> f. <i>bullata</i> )
'Okinazakura'	Okina-zakura (翁桜)	24	1	Kawasaki 7260 <sup>r</sup>		
'Omuro-ariake'	Omuro-ariake (御室有明)	16	1	Kawasaki 1469 <sup>r</sup>		
'Purpurea'	Murasaki-zakura (紫桜)	16	1	Kawasaki 3839 <sup>y</sup>	16	Okabe 1928 (as <i>P. serrulata</i> f. <i>purpurea</i> )
'Ranran'	Ranran (蘭蘭)	16	1	Kawasaki 3836 <sup>y</sup>		

'Sekiyama'	Kanzan (関山)	16	1	Kawasaki 5169 <sup>r</sup>	16	Okabe 1927 (as <i>P. serrulata</i> 'Kanzan'), 1928 (as <i>P. serrulata</i> f. <i>purpurascens</i> )
'Sendai-shidare'	Sendai-shidare (仙台枝垂)	16	1	Kawasaki 1384 <sup>r</sup>		
'Shizuka'	Shizuka (静香)	16	1	Kawasaki 7280 <sup>r</sup>		
'Shonaden'	Shō-naden (小南殿)	16	1	Kawasaki 5230 <sup>r</sup>		
'Shujaku'	Suzaku (朱雀)	16	1	Kawasaki 1380 <sup>r</sup>		
'Sirayuki'	Shirayuki (白雪)	24	2	Kawasaki 3831 <sup>v</sup> Kawasaki 5102 <sup>r</sup>	16	Okabe 1927 (as <i>P. serrulata</i> 'Shirayuki')
'Sirotae'	Shirotae (白妙)	24	1	Kawasaki 7266 <sup>r</sup>	24	Okabe 1928 (as <i>P. serrulata</i> f. <i>nivea</i> )
'Sobanzakura'	Itsukayama (早晚山)	16	1	Kawasaki 5165 <sup>r</sup>	16	Okabe 1927 (as <i>P. serrulata</i> 'Shirotae'), 1928 (as <i>P. serrulata</i> f. <i>albida</i> ); Oginuma 1987 a
'Sphaerantha'	Kenrokuen-kiku-zakura (兼六園菊桜)	16	1	Kawasaki 5172 <sup>r</sup>		
'Suisho'	Suishō (水晶)	16	1	Kawasaki 5164 <sup>r</sup>		
'Superba'	Shōgetsu (松月)	16	2	Kawasaki 5166 <sup>r</sup> Kawasaki 5181 <sup>v</sup>	16	Okabe 1927 (as <i>P. serrulata</i> 'Shōgetsu'), 1928 (as <i>P. serrulata</i> f. <i>superba</i> )
'Taihaku'	Tai-haku (太白)	24	1	Kawasaki 6447 <sup>r</sup>		
'Taoyame'	Taoyame (手弱女)	16	1	Kawasaki 5228 <sup>r</sup>		
'Tsukubane'	Tsukubane (突羽根)	16	1	Kawasaki 5138 <sup>v</sup>		
'Wasinowo'	Washi-no-o (鷲の尾)	24	1	Kawasaki 7281 <sup>r</sup>	24	Okabe 1927 (as <i>P. serrulata</i> 'Washi-no-o'), 1928 (as <i>P. serrulata</i> f. <i>arguta</i> )
'Yae-benitorano-o'	Yae-beni-tora-no-o (八重紅虎の尾)	16	3	Kawasaki 5092 <sup>r</sup> Kawasaki 5151 <sup>r</sup> Kawasaki 5159 <sup>r</sup>		
cv.	Daimin (大明)	24	1	Kawasaki 5084 <sup>r</sup>		
cv.	Fusa-zakura (房桜)	16	1	Kawasaki 5149 <sup>r</sup>		
cv.	Goten-nioi (御殿匂)	16	1	Kawasaki 5226 <sup>r</sup>		
cv.	Hōmyōji (法明寺)	16	1	Kawasaki 5088 <sup>r</sup>		
cv.	Jūni-yae-zakura (従二八重桜)	16	1	Kawasaki 5090 <sup>r</sup>		
cv.	Matsumae-sarasa (松前更紗)	24	1	Kawasaki 5154 <sup>r</sup>		

Table 1. (continued)

Taxon	Japanese name	Present count (2h)	No. of plants examined	Voucher number	Previous report	Reference
cv.	Ōshika-zakura (大鹿桜)	16	1	Kawasaki 5089 <sup>r</sup>		
cv.	Yadake-murasaki (矢岳紫)	16	1	Kawasaki 5235 <sup>r</sup>		
var. <i>speciosa</i> (Koidz.) Makino 'Affinis'	Jō-nioi (上匂)	16	2	Kawasaki 5231 <sup>r</sup> Kawasaki 7278 <sup>r</sup>	16	Okabe 1927 (as <i>P. serrulata</i> 'Jō-mioi'), 1928 (as <i>P. serrulata</i> f. <i>affinis</i> )
'Surugadai-odora'	Surugadai-nioi (駿河台匂)	16	1	Kawasaki 5130 <sup>r</sup>	16	Okabe 1928 (as <i>P. serrulata</i> f. <i>surugadai-odora</i> )
f. <i>formosa</i> (Nakai) Sugim.	Shiokaze-zakura (潮風桜)	16	1	Kawasaki 6446 <sup>r</sup>		
<i>P. lannesiana</i> (Carrière) E.H.Wilson × <i>P. sargentii</i> Rehder	Ōshū-sato-zakura (奥州里桜)	16	1	Kawasaki 1473 <sup>r</sup>		
<i>P. leveilleana</i> Koehne 'Sasabe-zakura'	Sasabe-zakura (笹部桜)	16	1	Kawasaki 7254 <sup>r</sup>		
<i>P. mahaleb</i> L. 'Pendula'		16	1	Kawasaki 3864 <sup>y</sup>		
<i>P. matuurae</i> Sasaki	Taihei-zakura (大平桜)	16	1	Kawasaki 5108 <sup>y</sup>		
<i>P.</i> × <i>media</i> Miyoshi 'Media'	Kaba-zakura (蒲桜)	16	1	Kawasaki 7250 <sup>y</sup>		
<i>P.</i> × <i>miyoshii</i> Ohwi 'Ambigua'	Taizan-fukun (泰山府君)	16	1	Kawasaki 5232 <sup>r</sup>	16	Oginuma and Tanaka 1976
<i>P.</i> × <i>mochidzukiana</i> Nakai	Mochizuki-zakura (望月桜)	16	1	Kawasaki 5201 <sup>y</sup>		
<i>P.</i> × <i>moniuana</i> Kawas.	Moniwa-zakura (茂庭桜)	16	1	Kawasaki 5099 <sup>r</sup>		
( <i>P. nipponica</i> Matsum. var. <i>kurilensis</i> (Miyabe) Miyabe × <i>P. campanulata</i> Maxim.) 'Kursar'	Kurusaru (クルサル)	16	1	Kawasaki 5254 <sup>y</sup>		
<i>P.</i> × <i>parvifolia</i> (Matsum.) Koehne 'Parvifolia'	Fuyu-zakura (冬桜)	24	1	Kawasaki 5249 <sup>r</sup>	24	Oginuma and Tanaka 1976
<i>P. pendula</i> Maxim. 'Pendula'	Shidare-zakura (枝垂桜)	16	1	Kawasaki 7252 <sup>y</sup>	16	Okabe 1928 (as <i>P. itosakura</i> Siebold nom. subnud.) ; Oginuma 1987 a
'Pendula-rosea'	Beni-shidare (紅枝垂)	16	1	Kawasaki 1128 <sup>r</sup>		
'Plena-rosea'	Yae-beni-shidare (八重紅枝垂)	16	1	Kawasaki 1451 <sup>r</sup>		
'Ujou-shidare'	Ujō-shidare (雨情枝垂)	16	1	Kawasaki 5186 <sup>y</sup>		
f. <i>ascendens</i> (Makino) Ohwi 'Komatsu-otome'	Komatsu-otome (小松乙女)	16	1	Kawasaki 7152 <sup>y</sup>	16	Oginuma and Tanaka 1976
<i>P. pseudocerasus</i> Lindl.	Shina-mizakura (支那実桜)	32	1	Kawasaki 1083 <sup>r</sup>	24	Oginuma 1987 a,b
					32	Okabe 1928 ; Oginuma 1987 b,1988



Table 1. (continued)

Taxon	Japanese name	Present count (2h)	No. of plants examined	Voucher number	Previous report	Reference
<i>P. × ischonoskii</i> Koehne	Nikkō-zakura (日光桜)	16	2	Koji Bessho <sup>o</sup> Kawasaki 5203 <sup>y</sup>		
<i>P. verecunda</i> (Koidz.) Koehne 'Antiqua'	Nara-no-yaе-zakura (奈良の八重桜)	16	1	Kawasaki 5077 <sup>r</sup>		
<i>f. norioi</i> Ohwi	Kataoka-zakura (片丘桜)	16	1	Kawasaki 5176 <sup>r</sup>	16	Oginuma and Tanaka 1976 (as <i>P. leu-eilleana</i> 'Norioi')
<i>P. × yedoensis</i> Matsum. 'Amagi-yoshino'	Amagi-yoshino (天城吉野)	16	2	Kawasaki 3852 <sup>y</sup> Kawasaki 5075 <sup>r</sup>	16	Tanaka and Oginuma 1975; Oginuma and Tanaka 1976; Oginuma 1987 a
'Amerika'	Amerika (アメリカ)	16	1	Kawasaki 5193 <sup>y</sup>		
'Funabara-yoshino'	Funabara-yoshino (船原吉野)	24	3	Kawasaki 5199 <sup>y</sup> Kawasaki 7241 <sup>r</sup> Kawasaki 7248 <sup>r</sup>		
'Izu-yoshino'	Izu-yoshino (伊豆吉野)	16	2	Kawasaki 5224 <sup>r</sup> Kawasaki 7247 <sup>r</sup>	16	Oginuma and Tanaka 1976
'Jindai-akebono'	Jindai-akebono (神代曙)	16	1	Kawasaki 5255 <sup>y</sup>		
'Kurama-zakura'	Kurama-zakura (鞍馬桜)	16	1	Kawasaki 7256 <sup>r</sup>		
'Manadzuru-littorea'	Mizutama-zakura (水玉桜)	16	1	Kawasaki 7262 <sup>r</sup>		
'Mikado-yoshino'	Mikado-yoshino (御帝吉野)	16	1	Kawasaki 5076 <sup>r</sup>		
'Mishima-zakura'	Mishima-zakura (三島桜)	16	1	Kawasaki 5225 <sup>r</sup>		
'Morioka-pendula'	Morioka-shidare (盛岡枝垂)	16	1	Kawasaki 5248 <sup>r</sup>		
'Perpendens'	Shidare-somei-yoshino (枝垂染井吉野)	16	1	Kawasaki 5239 <sup>r</sup>		
'Rubriflora'	Benizuru-zakura (紅鶴桜)	16	1	Kawasaki 5241 <sup>r</sup>		
'Sakuyahime'	Sakuyahime (咲耶姫)	16	1	Koji Bessho <sup>o</sup>		
'Somei-nioi'	Somei-nioi (染井匂)	16	1	Kawasaki 1449 <sup>r</sup>		
'Sotorihime'	Sotorihime (衣通姫)	16	1	Kawasaki 7255 <sup>r</sup>		
'Syouwa-zakura'	Shōwa-zakura (昭和桜)	16	1	Kawasaki 5152 <sup>r</sup>		

'Yedoensis'	Somei-yoshino (染井吉野)	16	1	Kawasaki 5198 <sup>†</sup>	16	Ishikawa 1916 (as <i>P. jedoensis</i> ) ; Okabe 1927, 1928 ; Tanaka and Oginuma 1975 ; Oginuma and Tanaka 1976 ; Oginuma 1987 a
cv.	Shirataki-shidare (白滝枝垂)	16	1	Kawasaki 7267 <sup>†</sup>		
<i>P. ×yedoensis</i> Matsum. 'Amagi-yoshino' (♀) × <i>P. campanulata</i> Maxim. (♂)	Yōkō (陽光)	16	1	Kawasaki 5247 <sup>†</sup>		
<i>Prunus</i> sp.	Pinku-kuraudo (ピンククラウド)	16	1	Kawasaki 5196 <sup>†</sup>		
<i>Prunus</i> sp.	Furusato-zakura (古里桜)	24	1	Kawasaki 7151 <sup>†</sup>		

<sup>†</sup> Material of 'Komatsunagi' (2n=16) of Oginuma and Tanaka (1976) is a cultivar belongs to *P. pendula* f. *ascendens*.

<sup>†</sup> Material from the Tama Forest Science Garden at Hachioji in Tokyo Metropolis.

<sup>†</sup> Material from the Yuki Experimental Station of the Flower Association of Japan (Nihon Hana no Kai), Ibaraki Prefecture.

1. Their chromosome counts found in the present study together with their chromosome numbers reported previously are also listed in Table 1.

As shown in the Table, *Prunus* subg. *Cerasus* studied displayed four different chromosome counts,  $2n=16$ , 24, 32 and 48. Based on  $x=8$  (Darlington and Wylie 1955), these counts showed euploid series and were interpreted as diploid ( $2n=16$ ), triploid ( $2n=24$ ), tetraploid ( $2n=32$ ) and hexaploid ( $2n=48$ ). In the 193 taxa studied, 161 taxa (83.4%) were diploid, 30 taxa (15.5%) were triploid, one species was tetraploid, and one species was hexaploid. The result shows that the majority of the cultivated *Prunus* subg. *Cerasus* taxa of Japan are diploid.

The chromosome number of *P. lannesiana* 'Nigrescens' was reported as  $2n=25$  (Okabe 1928). Does the report of  $2n=25$  for *P. lannesiana* 'Nigrescens' represent aneuploidy, or is the count an error? Except for the report made by Okabe (1928), aneuploidy has not been found in any Japanese taxa in subg. *Cerasus*. Moreover, all plants of *P. lannesiana* 'Nigrescens' investigated in the study were verified as triploid ( $2n=24$ ). Hence, the  $2n=25$  for this taxon given by Okabe (1928) may be due to miscount caused by the technical difficulties of several decades ago.

Some *Prunus* subg. *Cerasus* taxa are known to comprise two cytological forms: *P. lannesiana* 'Sirayuki', one diploid and the other triploid (Okabe 1927, 1928); *P. pendula* 'Pendula', one diploid and the other triploid (Okabe 1928; Oginuma 1987 a); *P. pseudocerasus*, one triploid and the other tetraploid (Okabe 1928; Oginuma 1987 a,b, 1988); *P. ×subhirtella* 'Subhirtella', one diploid and the other triploid (Okabe 1928; Sax 1931; Oginuma and Tanaka 1976; Oginuma 1987 a). In the present study, *P. ×introrsa* 'Introrsa' and 'Sirayuki' were triploid with  $2n=24$ , but both of them were previously reported as diploid with  $2n=16$  (Okabe 1927; Somego 2000); *P. ×subhirtella* 'Autumnalis' was diploid with  $2n=16$ , while Oginuma and Tanaka (1976) and Oginuma (1987 a) were reported them as triploid with  $2n=24$ . Disagreements of chromosome counts between previous reports by different authors and findings in the present study of these cultivars, await further cytological and taxonomical studies.

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岩坪美兼<sup>1</sup>・川崎哲也<sup>2</sup>・鳴橋直弘<sup>1</sup>：サクラ属 *Cerasus* 亜属 193 分類群の染色体数

サクラ属 *Cerasus* 亜属 193 分類群 (野生種を含む) について、染色体数を明らかにした。そのうち 148 分類群の染色体数は初めての報告である。

二倍体 (2n=16)

アギシコギクザクラ, アズマニシキ, アマギヨシノ, アマノガワ, アメリカ, アラタマ, イズタガアカ, イズヨシノ, イチハラトラノオ, イチヨウ, イツカヤマ, イモセ, イヨウスズミ, ウコン, ウジョウシダレ, ウミネコ, エイゲンジ, エド, オウシウサトザクラ, オオカンザクラ, オオシカザクラ, オオタザクラ, オオミネザクラ, オオムラザクラ, オカメ, オグラヤマザクラ, オシドリザクラ, オムロアリアケ, オモイガワ, カタオカザクラ, カッテザクラ, カバザクラ, カワヅザクラ, カンザクラ, カンザン, カンヒザクラ, ガンマンザクラ, ギオウジギジョザクラ, キクザクラ, キナシチゴザクラ, キヌガサ, キブネウズ, ギョイコウ, キリン, キンキマメザクラ, クシロヤエ, クマガイ, クマガイザクラ, クラマザクラ, クルサル, ケタノシロキクザクラ, ケンロクエンキクザクラ, ケンロクエンクマガイ, コウカ, コケシミズ, コジョウノマイ, ゴシヨニオイ, ゴシンザクラ, ゴテンニオイ, ゴテンバザクラ, コトヒラ, コノハナザクラ, コヒガン, コブクザクラ, コマツオトメ, コンゴウザン, サクヤヒメ, ササベザクラ, サノザクラ, シオカゼザクラ, シキザキチョウジザクラ, シキザクラ, シズカ, シ

ダレザクラ, シダレソメイヨシノ, ジュウガツザクラ, ジュウニヤエザクラ, シュゼンジカンザクラ, ショウゲツ, ショウドウヒガン, ショウナデン, ショウニオイ, ショウフクジザクラ, ショウワザクラ, シラタキシダレ, ジンダイアケボノ, スイシヨウ, スザク, スルガダイニオイ, スンプザクラ, センシヨウジキクザクラ, センダイシダレ, センダイヨシノ, ソウドウザクラ, ソトオリヒメ, ソメイニオイ, ソメイヨシノ, タイザンフクン, タイヘイザクラ, タオヤメ, タケシマザクラ, チチブザクラ, チハラザクラ, ツクバネ, ナジマザクラ, ナラノヤエザクラ, ニッコウザクラ, ニドザクラ, バイゴジジュズカケザクラ, ハクサンオオデマリ, ハナガサ, ヒウチダニキクザクラ, ヒナギクザクラ, ヒヨシザクラ, ヒヨドリザクラ, ピンククラウド, フゲンゾウ, フサザクラ, フジキクザクラ, フダンザクラ, ベニガサ, ベニシグレ, ベニシダレ, ベニヅルザクラ, ホウミョウジ, ホザキヒガンヤエザクラ, ホタテ, マツマエ, マツマエアイゼン, マツマエウスガサネソメイ, マツマエウスベニコノエ, マツマエカザンイン, マツマエハナゾメイ, マツマエベニヒゴロモ, マツマエヤエコトブキ, ミカドヨシノ, ミクルマガエシ, ミシマザクラ, ミズタマザクラ, ミッカビザクラ, ミドノヤエ, ミドリザクラ, ミノブザクラ, ムシャザクラ, ムラサキザクラ, モチヅキザクラ, モニワザクラ, モリオカシダレ, ヤエベニシダレ, ヤエベニトラノオ, ヤエベニヒガン, ヤダケムラサキ, ヨウキヒ, ヨウコウ, ヨウロウザクラ, ヨコハマヒザクラ, ランラン, リュウキュウヒザクラ, ワタナベザクラ, *P. mahaleb* 'Pendula', *P. serrulata* var. *hupehensis*.

三倍体 (2n=24)

アメダマザクラ, アリアケ, ウスズミ, オオヂョウチン, オキナザクラ, カリギヌ, コウダイジ, コシノヒガンザクラ, コマツナギ, シラユキ, シロタエ, タイハク, ダイミン, タカサゴ, タカトオコヒガン, ツバキカンザクラ, トウカイザクラ, ハツミヨザクラ, フクロクジュ, フナバラヨシノ, フユザクラ, フルサトザクラ, ベニユタカ, ホクホウ, マツマエサラサ, マツマエハヤザキ, ミョウシヨウジ, ワシノオ, (*P. sargentii* × *P. subhirtella*) 'Accolade', (*P. pseudocerasus* × *P. subhirtella*) 'Wadai'.

四倍体 (2n=32)

シナミザクラ.

六倍体 (2n=48)

*Prunus psilliflora*.

コヒガン, シダレザクラ, そしてシラユキでは、二倍体と三倍体が報告されており、シナミザクラで

は三倍体と四倍体が報告されている。また、ジュウガツザクラでは三倍体も報告されており、ツバキカンザクラでは二倍体も報告されている。これらのサクラについては、今後さらに細胞学的調査と分類学

的研究を行う必要がある。

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