Chromosome numbers of 36 cultivated taxa of Prunus subg.Cerasus in Japan

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Yoshikane Iwatsubo[1], Yoo Sengi[2] and Naohiro Naruhashi[1]: **Chromosome numbers of 36 cultivated taxa of *Prunus* subg. *Cerasus* in Japan**

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The latest guide to the flowering cherries of Japan (Nihon Hana no Kai 2002) carries 350 taxa including both wild and cultivated taxa. The chromosome number of flowering cherry in Japan had been reported by Ishikawa (1916), Okabe (1927, 1928), Sax (1931), Tanaka and Oginuma (1975), Oginuma and Tanaka (1976), Nishikawa (1985), Oginuma (1987 a,b, 1988, 1993) and Somego (2000), which showed that the flowering cherry in Japan had diploids, triploids and tetraploids. The latest and preceding papers (Iwatsubo et al. 2002, 2003) of this series about the chromosome numbers of flowering cherries in Japan showed that, on the basis of the chromosome numbers of 217 taxa, the cherries in Japan had diploid, triploid, tetraploid and hexaploid plants, many of them were diploid plants followed by triploid, tetraploid and hexaploid plants. The authors found the chromosome numbers of more than one hundred taxa listed in the latest guide (Nihon Hana no Kai 2002) are unknown.

This is the third paper of a series of chromosome numbers of *Purunus* subg. *Cerasus* (Iwatsubo et al. 2002, 2003), which reports on the chromosome numbers of 36 taxa conserved in the Arboretum of Ishikawa Forest Experiment Station, Ishikawa Pref., central Japan.

Materials and methods

Meristems of leaf buds of 36 taxa in *Prunus* subg. *Cerasus* were collected from the plants conserved in the Arboretum of Ishikawa Forest Experiment Station. One plant from each taxon was used for the study. The leaf buds of cherry trees cut into halves with a razor were pretreated in a 2 mM 8–hydroxyquinoline solution for one hour at room temperature and kept at ca. 5℃ for about 15 h. They were 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℃ for 10 minutes, and then washed in tap water. They were stained in a drop of 1.5% lactopropionic orcein on the slide glass and ordinary squash technique was applied in preparation. Herbarium specimens made from the plants conserved in the Arboretum of Ishikawa Forest Experiment Station will be deposited in the Toyama Science Museum (TOYA).

Results and discussion

The studied taxa and their chromosome counts determined in the present study as well as counts reported previously by other authors are listed in Table 1. As seen in the Table, the chromosome counts registered so far showed an euploid series, based on x=8, of diploid (2n=16), triploid (2n=24) and tetraploid (2n=32). In the 36 taxa studied, 31 taxa are diploids, four taxa are triploids, and one taxon is a tetraploid. In these taxa, chromosome counts are reported here for the first time for 23 taxa: 20 are diploids and three are triploids. In the taxa studied, *P.* ×*introrsa* 'Introrsa' is reported as 2n=16 by Somego (2000), however, the preceding two papers of this series (Iwatsubo et al. 2002, 2003) as well as the present result all show this taxon has 2n=24 chromosomes. In 'Introrsa' the triploid (2n=24) form may be more widely cultivated than the diploid (2n=16) form. Okabe (1928) reported that *P. pendula* 'Pendula' had two forms

Table 1. List of studied taxa of *Prunus* subg. *Cerasus*, Japanese name, and present and previous chromosome counts

Taxon	Japanese name	Present count(2n)	Previous report	Reference
P. incisa Thunb. 'Akane-yae'	Akane-yae（茜八重）	16		
'Micrantha'	Ko-mame-zakura（小豆桜）	16		
P.×*introrsa* Yagi ex Ohwi 'Introrsa'	Tsubaki-kanzakura（椿寒桜）	24	16	Somego 2000
			24	Iwatsubo et al. 2002, 2003
P. jamasakura Siebold ex Koidz. 'Geba-zakura'	Geba-zakura（下馬桜）	16		
'Octopes'	Yatsubusa-zakura（八房桜）	16		
'Sendaiya'	Sendaiya（仙台屋）	16	16	Iwatsubo et al. 2003
'Zenshoji-kikuzakura'	Zenshōji-kikuzakura（善正寺菊桜）	16	16	Iwatsubo et al. 2002
cv.	Midori-yama-zakura（緑山桜）	16		
cv.	Suji-gaku-yama-zakura（筋顎山桜）	16		
var. *chikusiensis*（Koidz.）Ohwi	Tsukushi-zakura（筑紫桜）	16		
f. *pubescens*（Makino）Ohwi	Usuge-yama-zakura（薄毛山桜）	16		
P. lannesiana（Carrière）E.H.Wilson 'Amayadori'	Amayadori（雨宿）	16		
'Beni-tamanishiki'	Beni-tamanishiki（紅玉錦）	16	16	Iwatsubo et al. 2003
'Fasciculata'	Itokukuri（糸括）	16		
'Horinji'	Hōrinji（法輪寺）	16		
'Kusimana'	Kushima-zakura（玖島桜）	16		
'Moutan'	Botan（牡丹）	24		
'Polycarpa'	Fuku-zakura（福桜）	24		
'Purpurea-plena'	Yae-murasaki-zakura（八重紫桜）	16		
'Shibayama'	Shibayama（芝山）	24		
var. *speciosa*（Koidz.）Makino 'Akami-ohshima'	Akami-ōshima（赤実大島）	16	16	Iwatsubo et al. 2003
'Cataracta'	Taki-nioi（滝匂）	16		
'Gozanomanioi'	Gozanoma-nioi（御座の間匂）	16		
'Kanzaki-ohshima'	Kanzaki-ōshima（寒咲大島）	16		
f. *plena* Y. Kimura	Yae-no-ōshima-zakura（八重の大島桜）	16	16	Oginuma 1987 a
P. pendula Maxim. 'Pendula'	Shidare-zakura（枝垂桜）	16	16	Okabe 1928（as *P. itosakura* Siebold）; Oginuma 1987 a; Iwatsubo et al. 2002
			24	Okabe 1928（as *P. itosakura* Siebold）
'Pendula-rosea'	Beni-shidare（紅枝垂）	16	16	Iwatsubo et al. 2002
P. pseudocerasus Lindl.	Shina-mizakura（支那実桜）	32	24	Oginuma 1987 a,b
			32	Okabe 1928; Oginuma 1987 b, 1988; Iwatsubo et al. 2002
P. sargentii Rehder	Ōyama-zakura（大山桜）	16	16	Okabe 1927, 1928（as *P. sachalinensis* Miyoshi）; Oginuma and Tanaka 1976; Oginuma 1987 a; Iwatsubo et al. 2003
P. serrulata Lindl. f. *Longipes* Miyoshi	Oku-miyako（奥都）	16		
P.×*subhirtella* Miq. 'Autumnalis'	Jūgatsu-zakura（十月桜）	16	16	Iwatsubo et al. 2002, 2003
			24	Oginuma and Tanaka 1976; Oginuma 1987 a
'Subhirtella'	Ko-higan（小彼岸）	16	16	Okabe 1928（as *P. subhirtella*）; Sax 1931（8 II, as *P. subhirtella*）; Iwatsubo et al. 2002, 2003
			24	Oginuma and Tanaka 1976; Oginuma 1987 a
P.×*yedoensis* Matsum. 'Candida'	Usuge-ōshima（薄毛大島）	16		
'Hayazaki-oshima'	Hayazaki-ōshima（早咲大島）	16		
'Kurama-zakura'	Kurama-zakura（鞍馬桜）	16	16	Iwatsubo et al. 2002
Prunus sp.	Izutaga-shiro（伊豆多賀白）	16		

of cytotypes : 2n=16 and 24 chromosomes. However, recent (Oginuma 1987 a ; Iwatsubo et al. 2002) and present studies for this taxon all showed 2n=16 chromosomes. The diploid (2n=16) form appears to be more widely cultivated than the triploid (2n=24) form. The plant of *P*.×*subhirtella* 'Subhirtella' used in the study was a diploid plant with 2n=16 chromosomes, but this taxon is known to have two cytological forms ; one diploid with 2n=16 chromosomes (Okabe 1928 ; Sax 1931 ; Iwatsubo et al. 2002, 2003) and the other triploid with 2n=24 chromosomes (Oginuma and Tanaka 1976 ; Oginuma 1987 a). 'Subhirtella' is considered as a hybrid between *P. incisa* and *P. pendula* f. *ascendens* (Kawasaki 1994), both of which are known to be diploid taxa (Okabe, 1927, 1928 ; Sax 1931 ; Tanaka and Oginuma 1975 ; Oginuma and Tanaka 1976 ; Oginuma 1987 a ; Iwatsubo et al. 2003). Thus, in the two cytological forms of 'Subhirtella', the diploid form appears to be a hybrid plant having one chromosome set from each of the two parent species.

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岩坪美兼[1]・千木　容[2]・鳴橋直弘[1]：サクラ属 *Cerasus* 亜属 36 分類群の染色体数

サクラ属 *Cerasus* 亜属 36 分類群（野生種を含む）について，染色体数の観察を行った。31 分類群は二倍体，4 分類群は三倍体，そして 1 分類群は四倍体であった。観察の結果は以下のとおりである。これらのうち 23 分類群の染色体数は初めての報告である（*印は初報告の分類群）。

二倍体（2n=16）のサクラ：

アカネヤエ*，アカミオオシマ，アマヤドリ*，イズタガシロ*，イトククリ*，ウスゲオオシマ*，ウスゲヤマザクラ*，オオヤマザクラ，オクミヤコ*，カンザキオオシマ*，クシマザクラ*，クラマザクラ，ゲバザクラ*，ゴザノマニオイ*，コヒガン，コマメザクラ*，シダレザクラ，ジュウガツザクラ，スジガクヤマザクラ*，ゼンショウジキクザクラ，センダイヤ，タキニオイ*，ツクシザクラ*，ハヤザキオオシマ*，ベニシダレ，ベニタマニシキ，ホウリンジ*，ミドリヤマザクラ*，ヤエノオオシマザクラ，

ヤエムラサキザクラ*，ヤツブサザクラ*。

三倍体（2n=24）のサクラ：

シバヤマ*，ツバキカンザクラ，フクザクラ*，ボタン*。

四倍体（2n=32）のサクラ：

シナミザクラ。

以上の 36 分類群のなかで，ツバキカンザクラには二倍体の報告があり，コヒガン，シダレザクラ，シナミザクラ，ジュウガツザクラには三倍体の報告がある。今回の石川県林業試験場に保存されているサクラの観察ではコヒガン，シダレザクラ，ジュウガツザクラは二倍体，ツバキカンザクラは三倍体，そしてシナミザクラは四倍体であり，いずれもサクラの染色体数に関するこのシリーズの以前の報告（Iwatsubo et al. 2002, 2003）と一致した。

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