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Evaluation of leaf morphology for distinguishing *Prunus* (Rosaceae) from Jeju, Korea

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Leaf morphology was examined for *Prunus* species from Jeju Island. Analyzed were the leaf blade length, petiole length, width of blade, number of veins and angle of the base to the mid-vein as quantitative characters and the distribution of trichome, position of glandsand leaf features qualitative characters. A total of 25 OTU were phenetically analyzed by UPGMA. The resuling phenograms slightly differ from the currently recognized taxonomic system in two points. *Prunus mume* was clustered with *P. padus* and *P. buergeriana*. *Prunu spendula* and *P. yedoensis* were separated from the cluster of *P. jamasakura*, *P. speciosa*, *P. sargentii* and *P. jamasakura* var. *quelpaertensis*. Except for the members of subgenus *Cerasus*, subgenera *Padus* (*P. buergeriana* and *P. padus*), *Microcerasus* (*P. japonica*) and *Amygdalus* were well defined. Some morphological characters of leaves such as the ratio of blade length to width, the length of blade to petiole, number of veins, the distance between the gland and base, the angle of base to mid-vein, and the distribution of trichome were useful as diagnostic features for *Prunus* from Jeju Island.

Key words: Diagnostic character, Jeju Island, leaf, morphological character, *Prunus*.

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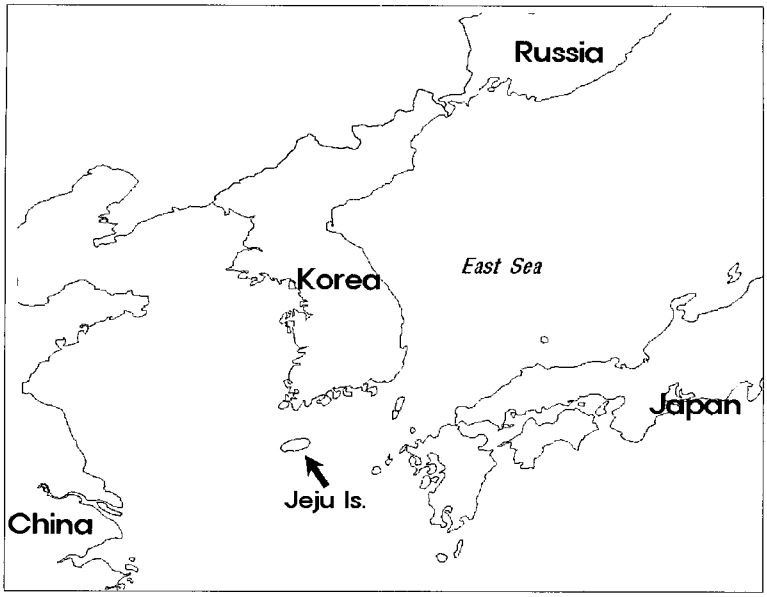

Fig. 1. Location of Jeju Island, Korea.

Prunus L. is a genus of ca 200 species of deciduous, rarely evergreen, trees or shrubs belonging to the family Rosaceae. The genus is widely distributed in temperate and subtropical regions of the Northern hemisphere (Bailey and Bailey, 1976; Cronquist, 1981; Mabberley, 1987; Hotta *et al.*, 1989). Twenty-two taxa are found in Korea, 13 of which are native to Jeju Island (Lee, 1976; Chang, 1994; Kim, 1998; Kim *et al.*, 1999).

The history of researches on *Prunus* native to Jeju dates back to 1912 when Koehne named *P. yedoensis* Matsumura var. *nudiflora* Koehne (1912). His new variety was based on a specimen collected from Jeju Isl. by Emile Taquet in 1902 (Koidzumi, 1913; Nakai, 1914, 1916; Wilson, 1916). To date, many researchers have performed taxonomic studies on *Prunus* native to Jeju (Harn, 1964, 1965; Lee, 1966; Harn *et al.*, 1977; Park *et al.*, 1984; Kim, 1990). However, only *P. yedoensis* has been phonetically analyzed for its morphological characters (Kim *et al.*, 1998).

Keys to identify *Prunus* species contain the inflorescence structure, trichome features, presence of stipules and the sepal shape. Leaf characteristics are also considered to be important in distinguishing taxa in the genus. *Prunus* have either a complete leaf with a blade, petiole and stipule or an incomplete leaf without stipules. *Prunus* species native to Korea are deciduous and have alternate simple leaves with elliptical, ovato-elliptical, ovate or ovato-obeovate shapes and they deciduous (Kim, 1998). Although the leaf characteristics

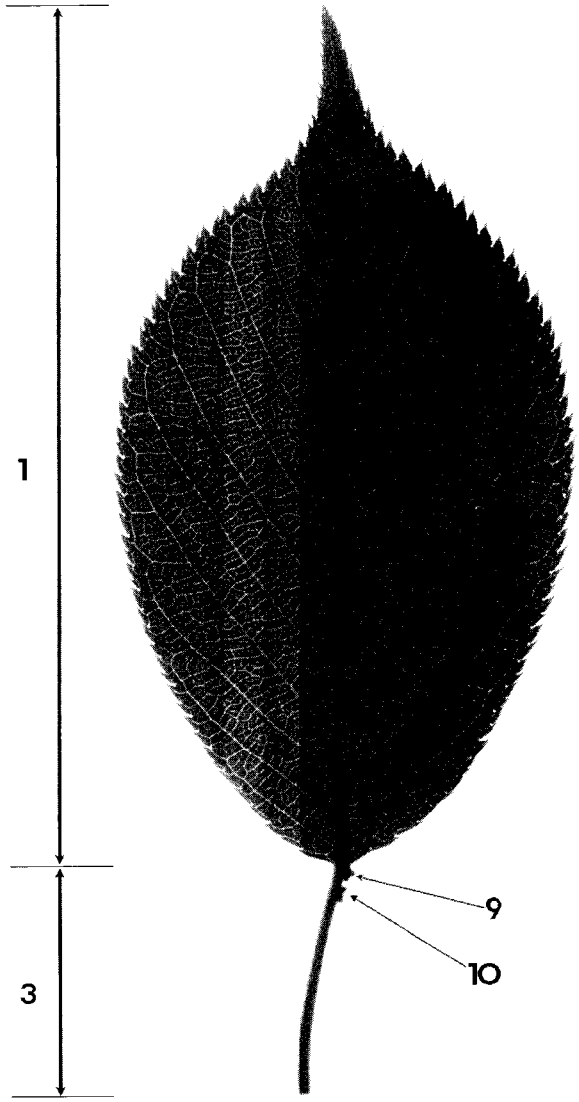

Fig. 2. Illustration of the leaf characters for measurement (see Table 1 for explanation of numbers).

are important in distinguishing *Prunus* taxa, the high level of variation makes them difficult to use without floral features.

We examined the leaf characteristics of 12 taxa native to Jeju, and standardized the

features of the species to see if leaf characters were applicable in distinguishing *Prunus* species as well as to determine the relationships among these taxa.

Materials and Methods

Examination of morphological characters Twelve taxa growing in Jeju were studied *Prunus buergeriana* Miquel, *P. jamasakura* Siebold ex G. Koidz., *P. jamasakura* Siebold ex Koidzume var. *quelpaertensis* (Nakai) Uyeki, *P. japonica* Thunb. ex Murray, *P. maximowiczii* Ruprecht, *P. mume* Seibold et Zucc., *P. padus* L., *P. pendula* Maximowicz f. *ascendes* (Makino) Ohwi, *P. persica* Batsch, *P. sargentii* Rehder, *P. speciosa* (Koidz.) Nakai, and *P. yedoensis* Matsumura (Fig. 1). One to six trees of each species, a total of 44 trees, were sampled. Thirty intact leaves of each tree were collected, pressed and dried in August 2004. The blade length and width, petiole length, and base angle from the right and left were measured as quantitative characterers. The leaf shapes, distribution of trichomes and gland position were qualitative characters (Fig. 2). The terminology used was that defined by Radford *et al.* (1974), Lee (1979) and Harris and Harris (1994).

Numerical analysis All data from measurements were divided into two groups as quantitative and qualitative characters. Twenty-five OUT were derived from the measurements and a data matrix then produced and standardized. Phenetic analysis was performed using the unweighted pair group method using arithmetic averages (UPGMA), and SPSS (SPSS Inc. 2002, Version 11.5) used for all statistic analysis.

Results and Discussion

Examination of morphological characters Leaf characters were evaluated as defined by two groups; quantitative and qualitative characters. We measured 12 morphological and two synthetic charactersrepresenting the quantitative characters. The measurements of each characters were statistically analyzed and are shown in Figs. 3, 4 and 5.

The shortest leaf length was that of *P. maximowiczii*, at 3.00 cm, and the longest was that of *P. speciosa*, at 17.20 cm. *Prunus persica* had the longest leaf blade, at 12.97±1.88 (6.8-15.70) cm on average, followed by *P. sepciosa*, *P. pendula* f. *ascendens* and *P. sargentii*. *Prunus mume* had the shortest leaf blade, at 7.22±1.03 (5.00-9.20) cm among

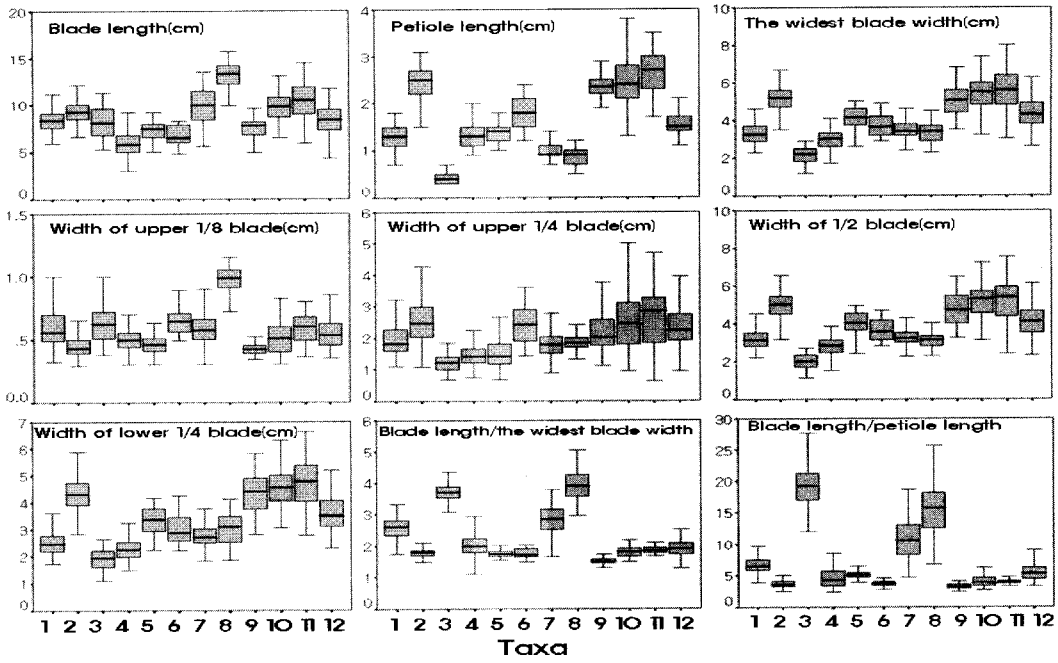

Fig. 3. Comparisons of leaf blade length and width, petiole length, distance between each site of blade, blade length/width, and blade length/petiole length among 12 *Prunus* taxa. 1; *P. buergeriana*, 2; *P. jamasakura*, 3; *P. japonica*, 4; *P. maximowiczii*, 5; *P. mume*, 6; *P. padus*, 7; *P. pendula* for. *ascendens*, 8; *P. persica*, 9; *P. jamasakura* var. *quelpaertensis*, 10; *P. sargentii*, 11; *P. speciosa*, 12; *P. yedoensis*.

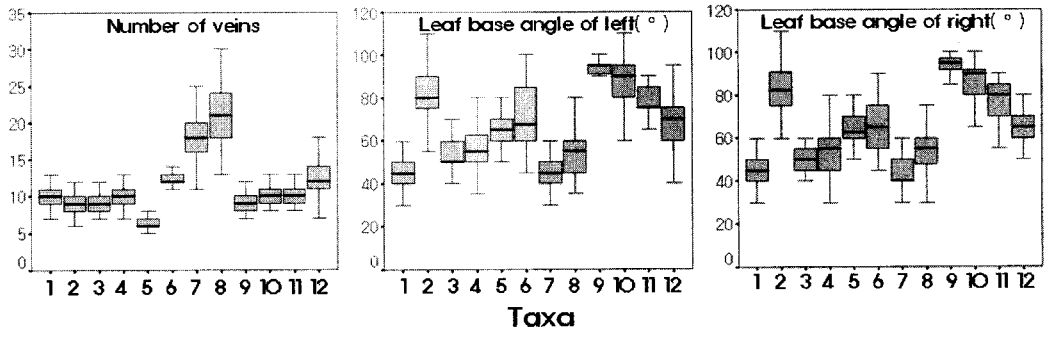

Fig. 4. Number of veins, leaf base angle of left and right among 12 *Prunus* taxa. umbers correspond to those in Fig. 3.

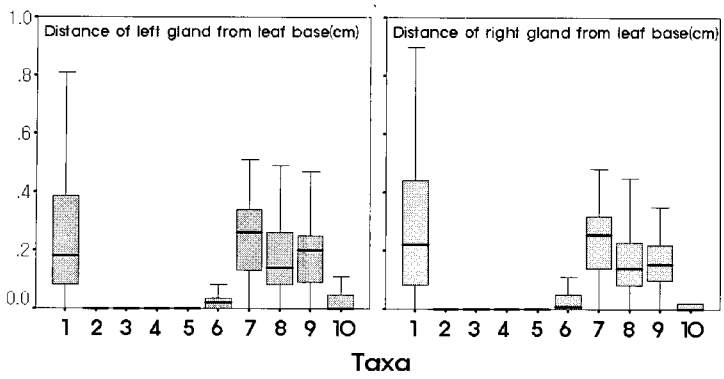

Fig. 5. Distance of left and right gland from leaf base among 12 *Prunus* taxa. Numbers correspond to those in Fig. 3.

the twelve taxa.

Prunus speciosa had the widest blade in terms of the widest blade width and width measured at other four sites on the leaf blade (1/8, 4/1, 1/2 and 3/4 of leaf blade, see Fig. 2.), and *P. japonica* had the narrowest. The widest and narrowest blade widths were those of *P. speciosa* and *P. japonica* at 8.00 cm and 1.20 cm, respectively. *Prunus sargentii*, *P. jamasakura*, and *P. jamasakura* var. *quelpaertensis* were sorted by average width, with *P. japonica* being the last in this parameter (Fig. 3).

In the measurement of the petiole length, the average length for *P. speciosa* was longest, at 2.61±0.43 (1.7-3.50) cm, followed by *P. sargentii*, *P. jamasakura* and *P. jamasakura* var. *quelpaertensis*. *Prunus japonica* had the shortest petiole (0.43±0.12 cm) (Fig.3).

Two synthetic data derived from the blade and petiole lengths (blade length/petiole length), and the blade length and width (blade length/blade widest width) indicated significant differences between the taxa that maybe used to identify species. While the ratio of the blade to petiole lengths *P. japonica*, *P. pendula* f. *ascendens* and *P. persica* were over 10, those for the others were below 10. We were able to divide the taxa into two groups using the ratio of the blade length to the blade's widest width *P. jamasakura*, *P. speciosa*, *P. persica*, *P. padus*, *P. jamasakura* var. *quelpaertensis*, *P. sargentii* and *P. yedoensis* were below three, constituting one group, and *P. japonica* and *P. persica* were above three, constituting the other.

As with the blade to petiole length ratio, the number of veins was a variable character, ranging from four pairs for *P. mume* to 30 pairs for *P. persica*. *P. persica* had

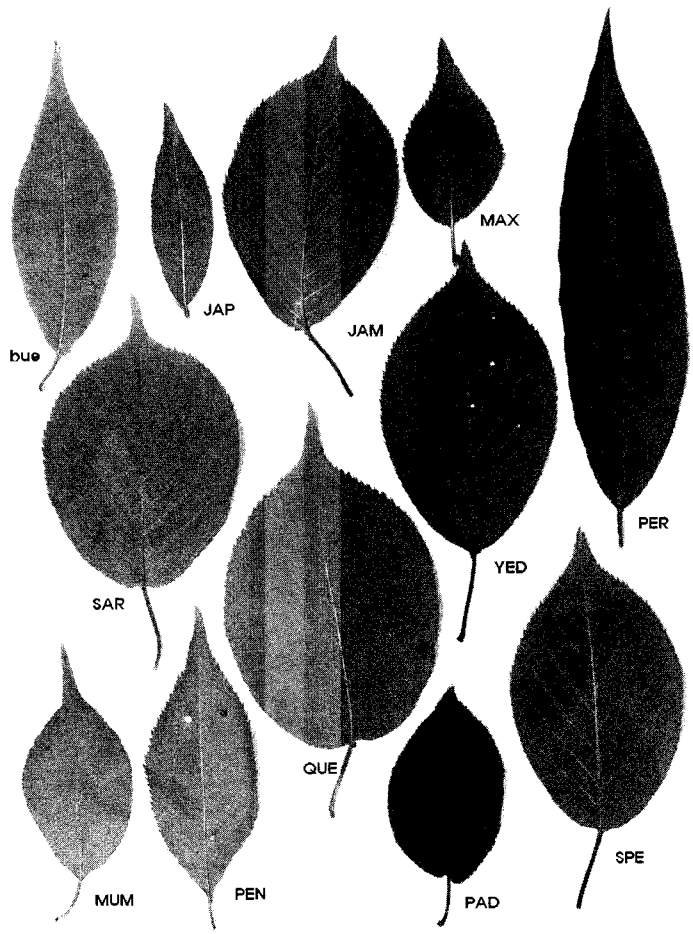

Fig. 6. Leaf shape of 12 *Prunus* taxa. BUE; *P. buergeriana*, JAM; *P. jamasakura*, JAP; *P. japonica*, MAX; *P. maximowiczii*, MUM; *P. mume*, PAD; *P. padus*, PEN; *P. pendula* for. *ascendens*, PER; *P. persica*, QUE; *P. jamasakura* var. *quelpaertensis*, SAR; *P. sargentii*, SPE; *P. speciosa*, YED; *P. yedoensis*.

21.18±3.45 pairs on average, followed by *P. pendula* f. *ascendens*, *P. yedoensis* and *P. padus*. *Prunus mume* (6.48±1.31 pairs) had less than 10 pairs of veins on average.

The angle of the leaf base to the mid-vein determined the shape of the leaf base, so is an important character inidentifying species. Eight taxa, *P. buergeriana*, *P. japonica*, *P. speciosa*, *P. maximowiczii*, *P. mume*, *P. pendula* f. *ascendens* and *P. persica*, had angles below 90°, whereas those of *P. buergeriana* and *P. pendula* f. *ascendens* were below 60°

Table 1. The explanation of leaf characters for measurement

No.	Characters
1	Blade length (cm)
2	The widest blade width (cm)
3	Petiole length (cm)
4	Width of upper 1/8 blade (cm)
5	Width of upper 1/4 blade (cm)
6	Width of 1/2 blade (cm)
7	Width of lower 1/4 blade (cm)
8	Number of vein
9	Distance of left gland from leaf base (cm)
10	Distance of right gland from leaf base (cm)
11	Leaf base angle of left
12	Leaf base angle of right
13	Blade length/the widest blade width
14	Blade length/petiole length

and that for *P. jamasakura* var. *quelpaertensis* was above 90°.

The distance between the base of the blade and gland reflects a more specific morphological feature of these taxa. *Prunus mume* and *P. japonica* were distinguished from the others due to the absence of glands. The glands of the three taxa, *P. maximowiczii*, *P. padus* and *P. pendula* f. *ascendens*, existed right on the leaf base, and whereas those of seven taxa were away from the leaf base, existing onthe petiole. The distance was less than 0.2 cm for *P. persica* and *P. yedoensis* among the seven taxa having glands on the petiole. Considering the quantitative descriptions of the morphological characters, the ratios of the blade length to width and blade to petiole lengths, the number of veins, distance of the glands from the leaf base and the angle of the leaf base to the mid-vein can be applied in the indentification. Figure 6 shows the various leaf shapes of the 12 *Prunus* taxa. The leaf shapes varied from oval to lanceolate, and with many variations appearing even in samples taken from the same tree (Table 2).

The taxa were divided in two groups in terms of their leaf apex, i.e. acuminate and caudate. The acuminate group consisted of *P. buergeriana*, *P. japonica*, *P. maximowiczii*, *P. padus*, and *P. pendula* f. *ascendens* and *P. persica*. *P. jamasakura*, *P. mume*, *P. jamasakura* var. *quelpaertensis*, *P. sargentii*, *P. speciosa* and *P. yedoensis* having acute leaf apex. With regard to the leaf base, *P. buergeriana*, *P. japonica*are cuneate and *P. pendula* f. *ascendens*, and *P. jamasakura* var. *quelpaertensis* and *P. sargentii* were subcordate, with the other taxa being acuate. Compare to the leaf size, the quantitative

Table 2. Description of leaf shape and margin of 12 taxa

Taxa	Shape			Margin
	outline	apice	base	
P. buergeriana	elliptic	acuminate	cuneate	serrulate
P. jamasakura	elliptic ovovato-elliptic	caudate	acuate	serrate
P. japonica	lanceolate ovate	acuminate	cuneate	bisserate
P. maximowiczii	ovate ovovate	acuminate	acuate	bisserate
P. mume	ovate	caudate	acuate	serrulate
P. padus	ovovato-oblong elliptic	acuminate	acuate	serrulate
P. pendula f. *ascendens*	elliptic oblong-elliptic	acuminate	cuneate	serrate
P. persica	elliptic oblong-elliptic	acuminate	acuate	serrulate
P. jamasakura var. *quelpaertensis*	elliptic ovovato-elliptic	caudate	subcordate	serrate
P. sargentii	elliptic ovovato-elliptic	caudate	subcordate	serrate
P. speciosa	elliptic ovovato-elliptic	caudate	acuate	serrate
P. yedoensis	elliptic ovovato-elliptic	caudate	acuate	serate

characteristcs of the leaf apex and base varied less, so provides more useful methods of identification.

All twelve taxa had teeth on their leaf margin six and four with serrate and serrulate, respectively, the other two, *P. japonica* and *P. maximowiczii*, had bisserate teeth, which can be used for the differentiation of the taxa (Table 2). The trichome distribution pattern is a useful key for identifying species in some families, as well as in *Prunus* (Sun, 1986; Hyun, 1988; Shin, 1989; Lee, 1992).

In this study, the trichome was distributed in three different patterns on the leaves, i.e. present over the entire leaf surface, on both the upper and lower surfaces of the blade and petiole, present in certain parts of surface or the complete absence of trichome. *Prunus maximowiczii* was the only species with trichome over the entire leaf surface. In *P. pendula* f. *ascendens* and *P. yedoensis*, trichome was found on the upper surface of

Table 3. Distribution of trichome in 11 taxa of *Prunus*.

	Blade		Petiole		Vein axil	Twig	Bud
	adaxial	abaxial	upper	lower			
P. buergeriana	−	−	−	−	+	−	−
P. jamasakura	−	−	−	−	+	−	−
P. japonica	+	+	+	−	+	−	+
P. maximowiczii	+	+++	+++	+++	+	+++	++
P. mume	−	+	+	−	+	−	−
P. padus	−	−	−	−	−	−	−
P. pendula f. *ascendens*	−	+++	+++	+++	+	+++	++
P. persica	−	+	−	−	−	−	+
P. jamasakura var. *quelpaertensis*	−	−	+	−	−	−	−
P. sargentii	−	−	−	−	+	−	−
P. speciosa	−	−	−	−	−	−	−
P. yedoensis	−	++	++	++	+	++	++

−; absent, +; rare, ++; common, +++; abundant.

blade, petiole and vein axil. Trichome existed on both the upper and lower surfaces of the blade, the upper surface of the petiole and on the vein axil in *P. japonica*. The trichome of *P. mume* existed on the bottom surface of the blade, upper surface of the petiole and on the vein axil. *Prunus jamasakura* var. *quelpaertensis* had trichome only on the upper surface of the petiole and *P. persica* on the bottom surface of the blade. Little trichome was observed on the vein axil in *P. buergeriana*, *P. jamasakura* and *P. sargentii*, but no trichome was found in *P. padus* and *P. speciosa*. *Prunus maximowiczii*, *P. pendula* f. *ascendens* and *P. yedoensis* had trichome on both their twigs and winter buds, whereas *P. japonica* and *P. persica* had trichome on their winter buds.

Numerical analysis The measurements of the quantitative characters stated in Table 2 were used as OTUs for a cluster analysis. All data were used after standardization to minimize the effect of excessive measurements, and then applied to the UPGMA for the construction of phenograms. As a result of the cluster analysis, a dissimilarity coefficient matrix, shown in Table 4, was created based on the phenogram.

Two major groups were defined by the cluster analysis based on measurements of the

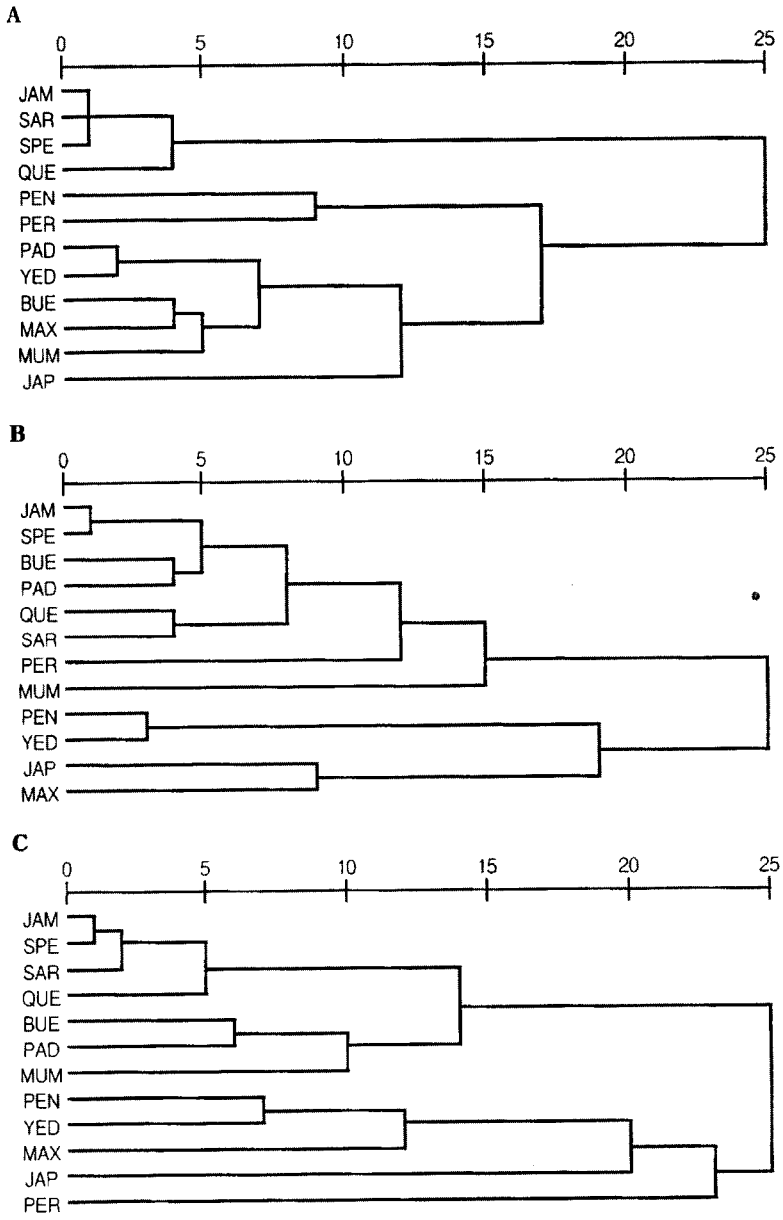

Fig. 7. Phenograms obtained from (A) complete linkage rescaled distance cluster by quantitative characters of leaves, (B) complete linkage rescaled distance cluster by qualitative characters of leaves, and (C) complete linkage rescaled distance cluster by the combination of all morphological characters of leaves. Abbreviations correspond to those in Fig. 6.

Table 4. Dissimilarity coefficient matrix for phenogram by 14 quantitative characters in each taxa. Abbreviations correspond to those in Fig. 6.

	BUE	JAM	JAP	MAX	MUM	PAD	PEN	PER	QUE	SAR	SPE
JAM	26.37										
JAP	15.82	62.55									
MAX	5.35	29.96	18.61								
MUM	7.90	13.09	28.58	5.61							
PAD	9.33	11.06	36.01	9.72	7.09						
PEN	6.32	35.29	17.19	14.78	18.79	17.38					
PER	25.59	55.40	26.40	42.40	45.48	37.20	12.56				
QUE	33.83	2.95	66.85	30.15	13.98	13.01	44.66	67.59			
SAR	31.81	0.65	68.94	36.51	17.66	13.80	39.18	55.30	3.57		
SPE	29.94	1.87	69.09	38.53	19.27	14.97	37.03	50.69	7.86	1.09	
YED	8.64	7.14	35.52	12.78	5.87	2.12	13.25	31.23	11.48	9.18	9.32

quantitative characters (Table 4, Fig. 7A). *Prunus jamasakura*, *P. jamasakura* var. *quelpaertensis*, *P. sargentii* and *P. speciosa* were clustered to form one group, with the rest constituting the other group. This phenogram shows that *P. padus* belongs to the subgenus *Padus* (Moench) Focke and is related to *P. yedoensis*, which belongs to the subgenus *Cerasus* (Adans) Focke. Also, *P. buergeiana,* which is in the subgenus *Padus*, appeared to have a close relationship with *P. persica* of the subgenus *Amygdalus* (L.) Benth. & Hook. The phenogram based on the quantitative characters only revealed different relationships to those of the current taxonomic systems. Although the quantitative characters are available to identify genera, these are not appropriate for deducing the relationships among taxa.

A data matrix was created by weighted measurements of 11 qualitative characters. All data were standardized, as above, and a dissimilarity coefficient matrix and phenogram then constructed (Tables 6, 7; Fig. 7B). The trichome distribution was a key characters for defining two clusters. This phenogram differed from the one based on the quantitative characters with regard to the cluster pattern and distance between the taxa. In this phenogram, *P. padus* and *P. buergeraina,* which are in the subgenus *Padus*, were closely linked and *P. yedoensis* and *P. pendula* f. *ascendens* of the subgenus *Cerasus* also have relationships. *Prunus mume*, one of the subgenus *Prununophora* (Neck.) Focke, was isolated from other clusters, such as taxonomic systems (Willson, 1913; Nakai, 1916; Krussman, 1986). Although the phenogram reflected the currently recognized taxonomic systems in some ways, the qualitative characters could not provide congruent data to

Table 5. Characters and character states used in the phenetic analysis of leaves

No.	Character	Character state
1	Hairiness of upper surface of blade	absence (0), presence (1)
2	Hairiness of lower surface of blade	absence (0), presence (1)
3	Hairiness of upper surface of petiole	absence (0), presence (1)
4	Hairiness of lower surface of petiole	absence (0), presence (1)
5	Hairiness of vein axile	presence (0), absence (1)
6	Hairiness of twig	absence (0), presence (1)
7	Hairiness of bud	absence (0), presence (1)
8	Nectar gland	petiole (0), leaf base (1), absence (2),
9	Leaf apex	acuminate (0), caduate (1)
10	Leaf margin	serrate (0), serrulate (1), biserrate (2)
11	Leaf base	acute (0), cuneate (1), subcordate (2)

Table 6. Data matrix for phenetic analysis. Numbers and character states correspond to those in Table 5, and abbreviations correspond to those in Fig. 6

	1	2	3	4	5	6	7	8	9	10	11
BUE	0	0	0	0	0	0	0	1	0	1	1
JAM	0	0	0	0	0	0	0	0	1	0	0
JAP	1	1	1	0	0	0	1	2	0	2	1
MAX	1	1	1	1	0	1	1	1	0	2	0
MUM	0	1	1	0	0	0	0	2	1	1	0
PAD	0	0	0	0	1	0	0	0	0	1	0
PEN	0	1	1	1	0	1	1	1	0	0	1
PER	0	1	0	0	1	0	1	0	0	1	0
QUE	0	0	1	0	1	0	0	0	1	0	2
SAR	0	0	0	0	0	0	0	0	1	0	2
SPE	0	0	0	0	1	0	0	0	1	0	0
YED	0	1	1	1	0	1	1	0	1	0	0

explain the relationships among taxa.

We combined standardized measurements for both the quantitative and qualitative characters in order to revise the phenograms in relation to each character, and constructed a dissimilarity coefficient matrix and phenogram, as shown in Table 8 and Fig. 7C. The analysis yielded five defined clusters; *P. jamasakura*, *P. speciosa*, *P.*

Table 7. Dissimilarity coefficient matrix for phenogram by 11 qualitative characters in each taxa. Abbreviations correspond to those in Fig. 6.

	BUE	JAM	JAP	MAX	MUM	PAD	PEN	PER	QUE	SAR	SPE
JAM	8.50										
JAP	20.95	35.92									
MAX	30.72	39.34	12.96								
MUM	14.18	15.34	17.28	27.06							
PAD	7.31	9.44	31.43	34.85	21.49						
PEN	22.53	27.73	24.57	14.79	22.05	29.84					
PER	14.74	16.88	23.99	27.41	21.59	7.44	22.40				
QUE	16.29	14.15	36.38	46.16	22.16	15.34	28.19	22.78			
SAR	8.50	6.36	35.92	45.70	21.71	15.80	27.73	23.24	7.79		
SPE	12.62	4.13	40.05	43.46	19.47	5.32	31.85	12.75	10.03	10.49	
YED	29.38	20.88	34.60	18.46	21.56	30.32	6.85	22.89	27.70	27.24	25.01

Table 8. Dissimilarity coefficient matrix for phenogram by 14 quantitative characters and 11 qualitative characters in each taxa. Abbreviations correspond to those in Fig. 6.

	BUE	JAM	JAP	MAX	MUM	PAD	PEN	PER	QUE	SAR	SPE
JAM	34.87										
JAP	36.77	98.47									
MAX	36.08	69.30	31.57								
MUM	22.08	28.43	45.86	32.67							
PAD	16.64	20.50	67.44	44.57	28.58						
PEN	28.85	63.02	41.75	29.57	40.83	47.22					
PER	40.33	72.28	50.40	69.81	67.07	44.63	34.96				
QUE	50.12	17.11	103.23	76.31	36.14	28.36	72.85	90.37			
SAR	40.31	7.01	104.86	82.21	39.37	29.60	66.91	78.54	11.36		
SPE	42.56	5.99	109.14	81.99	38.74	20.29	68.88	63.45	17.89	11.58	
YED	38.02	28.02	70.11	31.24	27.43	32.45	20.09	54.11	39.18	36.43	34.33

sargentii and *P. jamasakura* var. *quelpaertensis* formed one group, with *P. buergeriana*, *P. padus* and *P. mume* appearing to have relationships, *P. pendula*f. *ascendens*, *P. yedoensis* and *P. maximowiczii* were one cluster, and *P. japonica* and *P. persica* formed separate groups.

This phenogram shows accordance with areas of the current taxonomic system (Willson, 1913; Krussman, 1986). The subgenus *Padus* (*P. buergeriana* and *P. padus*),

subgenus *Microcerasus* (Spach) Schneid. (*P. japonica*) and subgenus *Amygdalus* (*P. persica*) are well defined, as in the current taxonomic system. It, however, is not consistent with the current taxonomic system, in giving two different results. First, *P. mume* was clustered with *P. padus* and *P. buergeriana* and second, *P. pendula* and *P. yedoensis* were separated from the cluster of *P. jamasakura*, *P. speciosa*, *P. sargentii* and *P. jamasakura* var. *quelpaertensis*, except the members of the subgenus *Cerasus*.

With only the morphological characters of the leaves, the relationships between the taxa were not completely deduced compare to other characters, such as the fruit, seed, inflorescence structure and floral organ (Krussman, 1986). The results suggest that some of the morphological characters of the leaves were very useful in identifying taxa, such as the ratio of the blade length to width and the blade to petiole length, number of veins, the distance between the gland and leaf base, the angle of the leaf base to the mid-vein and the trichome distribution.

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제주도산 벚나무속 잎 형질의 분류학적 검토

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본 연구는 제주도산 벚나무속 식물을 대상으로 잎 형질의 분류학적 중요성을 검토하기 위하여 수행하였다. 양적 형질은 엽신의 길이, 엽병의 길이, 엽폭, 엽맥 수, 분지각과 엽저각 등을 조사하였다. 질적 형질은 모용분포와 밀선의 위치, 잎의 형태 등을 조사하였다. 총 25개의 OTU에 대해 UPGMA에 의한 표현형적 분석을 실시하였다. 그 결과 subgenus *Prunophora* 에 속하는 매실나무가 subgenus *Padus*에 속하는 귀룽나무와 섬개벚나무와 같은 유집군을 형성한 점과 subgenus *Cerasus*에 속하는 벚나무, *P. speciosa*, 산벚나무, 사옥와 올벚나무, 왕벚나무가 별개의 유집군을 형성한 점 등 일부 분류체계와 다른 양상을 보였다. 그러나 subgenus *Padus*에 속하는 귀룽나무와 섬개벚나무, subgenus *Microcerasus*에 속하는 이스라지, subgenus *Amygdalus*에 속하는 복사나무가 각각의 유집군을 형성하는 등 분류체계와 유사한 양상이 강하게 나타났다. 결국, 잎 형질, 그 중에서도 엽신의 길이와 폭의 비, 엽신의 길이와 엽병 길이의 비, 엽맥 수, 잎 기부에서 밀선과의 거리, 주맥과 잎 기부의 좌·우각 등과 모용의 분포 등이 제주도산 벚나무속의 식별형질이 될 수 있을 것으로 판단되었다.

주요어: 벚나무속, 잎, 형질, 제주도, 식별형질

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