A New Species, *Cerasus kumanoensis* from the Southern Kii Peninsula, Japan

TOSHIKO KATSUKI

*Tama Forest Science Garden, Forestry and Forest Products Research Institute, Todori 1833-81, Hachioji, Tokyo 193-0842, Japan. katsuki@ffpri.affrc.go.jp*

A new species, *Cerasus kumanoensis* T. Katsuki (Rosaceae), sp. nov., is described from the southern Kii Peninsula, Japan. It is similar to *C. jamasakura var. jamasakura* and *C. leveilleana* because the corymbose inflorescences and extended peduncle are identical in these three taxa. However, *C. kumanoensis* is distinguished by several morphological and phenological characteristics, an earlier flowering period, narrowly ovate and smaller leaf blade (4–8 cm long, 1.8–3.6 cm wide) and glabrous petiole and pedicel.

Key words: *Cerasus kumanoensis*, flowering cherry, flowering period, Japan, Kii Peninsula

The cherry genus *Cerasus* Mill. (Rosaceae) is widely distributed in the northern hemisphere. Nine species of *Cerasus* are native to Japan (Kawasaki 1993, Ohba 2001, Ikeda *et al.* 2017), where it has been cultivated for centuries for the aesthetic qualities of its blossoms and where many ornamental cultivars have been reported. Interspecific hybridization occurs relatively easily and numerous hybrid taxa have also been published in Japan. Although Japanese interest in cultivated *Cerasus* is so high that many studies have revealed morphological diversity in cultivars and hybrids (Wilson 1916, Ohwi 1953, Kawasaki 1993), in wild trees such interest has been relatively low and the morphological diversity within wild populations has not received much detailed examination. If Japanese wild *Cerasus* populations are examined in detail, undescribed taxa may be found, as is the case of *C. sargentii* (Rehd.) H. Ohba var. *akimotoi* H. Ohba & Mas. Saito (Ohba & Saito 2000). Here, I describe a new species of wild cherry, *C. kumanoensis*, sp. nov., from the Kii Peninsula, Japan.

*Cerasus jamasakura* (Siebold ex Koidz.) H. Ohba, *C. leveilleana* (Koehne) H. Ohba and *C. speciosa* (Koidz.) H. Ohba are morphologically distinct, exhibit genetic differences (Kato *et al.* 2014), and are treated as independent species in Japan (e.g., Ohwi 1953, Ohba 2001, Ikeda *et al.* 2017), although they have also been treated as varieties or forms of *C. serrulata* (Lindl.) G. Don ex Loudon (Koehne 1912, Wilson 1916, Chang *et al.* 2007). These three species are characterized by corymbose inflorescences with a long peduncle. *Cerasus kumanoensis* is considered to be close to the three species, because of its corymbose inflorescences and a peduncle that often extends to more than 10 mm in length during flowering. Among the species of *Cerasus* native to Japan, these characteristics occur only within these species.

*Cerasus kumanoensis* has pink petals and a short peduncle (1–4 mm long) during early blooming. It is similar to *C. sargentii var. sargentii* in appearance (Fig. 1B–E). The leaf blade on short shoots of *C. kumanoensis* (4–8 cm long, 1.8–3.6 cm wide) is obviously shorter and narrower than in *C. jamasakura* (5–9 cm long, 3–4 cm wide according to Kawasaki 1993), *C. leveilleana* (6–12 cm long, 3–6 cm wide according to Kawasaki 1993) and *C. sargentii* (7–11 cm long, 4.5–6.5 cm wide according to Kawasaki 1993), as
shown in Fig. 1G. The length and width of the leaf blade on the long shoots in Cerasus differ distinctly from those on short shoots (Oohara 2009), and most references provide both data of long shoots and short shoots. I refer to the sizes given in Kawasaki (1993) that is based only on short shoots. Additionally, C. kumanoensis is distinguished by its roughly serrate leaf margin (Fig. 2G) and pale green lower leaf surface (Fig. 1G), characters that in C. jamasakura are acutely serrate and glaucous, respectively. Cerasus kumanoensis is similar to C. leveilleana, but is distinguished by its glabrous petiole and pedicel (Fig. 1B, 2A, H).

Another remarkable feature of Cerasus kumanoensis is its flowering period. Within its natural range C. kumanoensis blooms earlier than C. jamasakura. The flowering period in 2017 of five individuals of C. kumanoensis and C. jamasakura, and one cultivated plant of C. × yedoensis (Matsum.) Masam. et Suzuki 'Somei-yoshino' in the towns of Kozagawa and Kushimoto, Wakayama Prefecture, are shown in Fig. 3. These individuals were near each other (horizontal distance within 1,700 m, altitude 20–120 m), and the environment related to flowering period, such as the mean temperature between 11 February and 10 May in 2017 (6.6 °C), appeared to be the same. The flowering periods of C. kumanoensis and C. jamasakura did not overlap in my observations. In individuals observed in detail, the flowering periods of surrounding individuals of the two taxa also did not overlap. As C. leveilleana blooms later than C. jamasakura (Miller-Rushing et al. 2007), C. kumanoensis and C. leveilleana also differ in flowering period and possibly do not cross with each other. Cerasus jamasakura, however, blooms later in this area than in some adjacent places. For example, in late April, when C. jamasakura blooms in Kozagawa, C. jamasakura in nearby Kamitonda has already finished flowering. Further studies are needed to determine the effectiveness of seasonal isolation between C. kumanoensis and C. jamasakura.

As a result of field surveys and examination of specimens in the Makino Botanical Garden (MBK), Tokushima Prefectural Museum (TKPM), Osaka Museum of Natural History (OSA) and Wakayama Prefectural Museum of Natural History (WMNH), a new taxon, Cerasus kumanoensis, was confirmed to occur only within Mie, Nara and Wakayama Prefectures. New specimens that I collected are preserved in TFA (herbarium of Tama Forest Science Garden, Forestry and Forest Products Research Institute, Japan). Since it has been thought that only C. jamasakura var. jamasakura and C. leveilleana occur in the southern Kii Peninsula (Murata 2004, Morimoto 2011), in-

### Table 1. Comparison of characters of flowers and leaves among Cerasus kumanoensis, sp. nov., C. jamasakura var. jamasakura and C. leveilleana.

<table>
<thead>
<tr>
<th>Characters</th>
<th>C. kumanoensis</th>
<th>C. jamasakura</th>
<th>C. leveilleana</th>
</tr>
</thead>
<tbody>
<tr>
<td>Peduncle length (mm)</td>
<td>1–4 (–10)</td>
<td>5–15</td>
<td>1–15</td>
</tr>
<tr>
<td>Petal color</td>
<td>pink (to white)</td>
<td>white</td>
<td>white to pink</td>
</tr>
<tr>
<td>Flowering period</td>
<td>Mid Mar. to early Apr.</td>
<td>Early to mid Apr.</td>
<td>Mid to late Apr.</td>
</tr>
<tr>
<td>Bract figure</td>
<td>obovate</td>
<td>narrowly ovate</td>
<td>broadly obovate</td>
</tr>
<tr>
<td>Flower number per inflorescence</td>
<td>1–2 (–3)</td>
<td>2–4</td>
<td>2–3</td>
</tr>
<tr>
<td>Leaf blade ** shape</td>
<td>narrowly ovate</td>
<td>narrowly elliptic</td>
<td>broadly obovate</td>
</tr>
<tr>
<td>Leaf blade ** length (cm)</td>
<td>4–8</td>
<td>5–9***</td>
<td>6–12***</td>
</tr>
<tr>
<td>Leaf blade ** width (cm)</td>
<td>1.8–3.6</td>
<td>3–4***</td>
<td>3–6***</td>
</tr>
<tr>
<td>Leaf margin</td>
<td>roughly serrate</td>
<td>acutely serrate</td>
<td>roughly serrate</td>
</tr>
<tr>
<td>Lower surface of leaf</td>
<td>pale green</td>
<td>glaucous</td>
<td>pale green</td>
</tr>
<tr>
<td>Petiole and pedicel</td>
<td>glabrous</td>
<td>glabrous</td>
<td>hairy</td>
</tr>
</tbody>
</table>

*Flowering period observed in towns of Kozagawa and Kushimoto, Wakayama Prefecture, Japan, in 2017. See text.

**Leaf blade observed on short shoot.

individuals of *Cerasus kumanoensis* have often been identified as one of them (e.g. WMNH 13705 and 23483 as *C. jamasakura* var. *jamasakura*, and OSA 240450 as *C. leveilleana*).

Since more than 50 names have been published among *C.serrulata* and related taxa from eastern Asia (Ohba 2001), the relationship between them and *C. kumanoensis* must be examined. *Prunus superflua* Koidz. (1932) has narrow leaf blades (6–11 cm long, 2.3–3.8 cm wide) and in general appearance is similar to *C. kumanoensis*, but the syntypes (*Y. Nabeshima s.n., 15 Apr. 1932, KYO & TI; G. Koidzumi s.n., 17 May 1932, KYO*) collected in Fukuoka Prefecture, Kyushu, have leaves with acutely serrate margins and narrowly ovate bracts, which support Ohba’s (2001) treatment of it as individual variation within *C. jamasakura*.

Six species, varieties or subvarieties have been published from the Kii Peninsula and its surroundings, but none of them corresponds to *C. kumanoensis*. Holotype specimens of *Prunus mutabilis* Miyoshi var. *dilatata* Nakai (1950) (*K. Torii s.n., 30 Oct. 1949, TNS 81083*) and *Prunus toriwii* Nakai (1953) (*K. Torii s.n., 15 Apr. 1951, TNS 86156*) from Aichi Prefecture have leaves with acutely serrate margins and narrowly ovate bracts. This supports Ohba’s (2001) treatment of them as representing individual variation within *C. jamasakura*. Makino (1906) and Makino (1928) described *Prunus pseudo-cerasus* Lindl. var. *spontanea* Maxim. subvar. *humilis* Makino and *Prunus ogawana* Makino from Kochi Prefecture. The narrowly elliptic leaves with acutely serrate margins of the syntypes of the former (*T. Makino s.n., 1889, MAK 223123, T. Makino s.n., Jun. 1893, 223124*) and the holotype of the latter (*T. Makino s.n., 17 Jun. 1927, MAK 225657*) suggest that both taxa from Kochi Prefecture are *C. jamasakura* as treated by Ohba (2001). A syntype of *Prunus pseudo-cerasus* Lindl. var. *jamasakura* Makino subvar. *pubescens* Makino (1908) (*S. Matsuda s.n., Apr. 1902, MAK 223105*) from Nara Prefecture has broadly obovate bracts and hairy pedicels, which support Ohba’s (2001) treatment of it as a synonym of *C. leveilleana*. Although I have not seen authentic specimens of *Prunus antiqua* Miyoshi (1922) from Nara Prefecture, it was treated as a cultivar of *C. leveilleana* by Kawasaki (1993).

### Taxonomic treatment

*Cerasus kumanoensis* T. Katsuki, sp. nov. — Figs. 1 & 2.

Similar to *C. leveilleana* (Koehne) H. Ohba, but distinguished by narrowly ovate and smaller leaf blades (4–8 × 1.8–3.6 cm in *C. kumanoensis* vs. 6–12 × 3–6 cm in *C. leveilleana*), earlier flowering period and glabrous pedicels and pedicles (Table 1).

**Typus.** JAPAN, Honshu, Wakayama Pref., Kozagawa, Ikenoyama, alt. 40 m, 21 Mar. 2017, T. Katsuki s.n. (holo.: TI 00012970. Iso-: TFA HDA-000256–258, TNS 1284055)

Trees, deciduous, to 16 m tall (flowering well even when less than 8 m tall), DBH up to 0.3 m. Bark purplish brown, almost smooth; lenticels distinct, horizontal; young branches yellowish brown, lustrous, glabrous, extending slightly horizontally. Leaves alternate, reddish brown or green when young, appearing after flowering, petiolate; petiole 14–20 mm long, usually glabrous; blade narrowly ovate, 4–8 cm long, 1.8–3.6 cm wide, base rounded to obtuse, margin simply or doubly roughly serrate, serrations with an apical gland, apex caudate-acuminate, upper surface with sparse soft hairs, lower surface glabrous and pale green, slightly lustrous, lateral veins 5–8 pairs, with trichomes in vein axils; apical part of petiole or base of blade with a pair of wart-like glands; stipules lanceolate, incised serrate. Bud scales sticky, outer surface glabrous, inside with hairs. Inflorescences corymbose, 20–36 mm across, 1- or 2- (or 3-)flowered, axillary, usually on previous year’s short shoots and sometimes on long shoots; peduncle 1–4 mm long to sometimes over 10 mm at the end of flowering, glabrous; pedicel 6–24 mm long, usually glabrous; bracts obovate, ca. 5 mm long, incised serrate with a gland. Flowers hermaphroditic; hypanthium glabrous, reddish purple, tube campanulate, slightly broadened apically, 4–8 mm long; calyx lobes ovate or narrowly ovate, ca. 5 mm
Fig. 2. *Cerasus kumanoensis*, sp. nov. A, flower (petals removed); B, longitudinal section of flower (petals removed); C, calyx lobe; D, petal; E, bract; F, bud scale; G, margin of mature leaf (upper surface); H, leaf base and petiole; I, stone. Drawn from isotype (TNS 1284055) and paratype (TNS 1284056) by K. Hamasaki.
long, margin entire or serrate, spreading at anthesis. Petals pink or sometimes white and slightly pink, narrowly to broadly elliptic, 10–20 mm long, 6–16 mm wide, base widely cuneate, apex emarginate. Stamens ca. 30, slightly shorter than style; filaments glabrous; pistil glabrous, 12–16 mm long. Fruits globose, glabrous, 6–8 mm across, blackish purple when mature, taste slightly bitter; stone flat, ovoid, 5–6 mm long.

**Phenology**. Coastal individuals (alt. 0–100 m) bloom earliest in late February whereas individuals in mountainous regions (alt. 600–800 m) bloom in late April. Foliation and seed germination take place slightly after flowering. Fruiting from mid May to early June.

**Distribution and habitat**. *Cerasus kumanoensis* is widely distributed in the southern part of the Kii Peninsula (Fig. 4). Specific localities are Hidagawa Town, Tanabe City, Shirahama Town, Susami Town, Kushimoto Town, Kozagawa Town, Nachi-katsuura Town, Taiji Town, Shingu City and Kitayama Village in Wakayama Prefecture, Kami-kitayama Village, Shimo-kitayama Village and Totsukawa Village in Nara Pref., and Owase City, Kumano City, Mihama Town and Kiho Town in Mie Prefecture. These localities are at 0 to 800 m elevation. *Cerasus kumanoensis* typically grows in young secondary forests alongside other deciduous broadleaved trees. It is occurs more on ridges and slopes, less in valleys and lowlands. It is common in mountainous areas inland and also in coastal locations to the south.

**Japanese name**. Kumano-zakura. **English name**. Kumano cherry.

**Etymology**. The species epithet kumanoensis refers to old regional name of the distribution area, Kumano.

**Notes**. *Cerasus kumanoensis* is morphologically distinct from *C. jamasakura* and *C. leveilleana*. The classification of *Cerasus* in different parts of the world, however, is inconsistent. For example, Kuitert (1999) and Chang et al. (2007)
do not treat *Cerasus jamasakura* as a species. To clarify this confusion, it is necessary to use molecular methods and population genetics and to examine the nomenclature. The genetic variation within the domesticated populations of *C. jamasakura* in Japan was revealed in recent years (Tsuda et al. 2009), but the relationship with *C. jamasakura* var. *chikusiensis* (Koidz.) H. Ohba on Kyushu and *C. leveilleana* and *C. serrulata* in China have not been examined. Although it is possible to identify the taxa of *Cerasus* in Japan using SSR markers (Kato et al. 2014), their phylogenetic relationships have not been determined. The possibility of a hybrid origin for *C. kumanoensis* must also be considered, but natural hybrid swarms in *Cerasus* in Japan have not been examined genetically. Further studies are therefore needed to determine the taxonomic classification of these taxa, including *C. kumanoensis*.


I thank Ms. Y. Yamashita, Mr. T. Hogen, Mr. K. Tanoue and Mr. S. Jyoudo of the Wakayama Prefectural Forestry Experiment Station, Mr. K. Okuda and Mr. M. Nakamura of the Mie branch, Japan Tree Doctors Association, Mr. K. Jinbo and Mr. O. Hashino of the Nanki Forestry Association, the staff of the Kozagawa Town Office, Mr. H. Sato in Kozagawa Town, the staff of the Kumano City Office and Mr. K. Okada in the Wakayama Prefectural Office for field surveys, Ms. A. Naito (WMNH), Mr. D. Sakuma (OSA), Ms. S. Fujii and Dr. K. Fujikawa (MBK), Mr. Y. Ibaragi and Mr. M. Ogawa (TKPM), Dr. H. Ikeda and Ms. A. Shimizu (TI), Dr. A. Ebihara (TNS), Dr. H. Nagamasu (KYO) and Dr. N. Murakami (MAK) for their generous support in the herbarium, and Ms. K. Hamasaki for the beautiful illustrations.

References


Received June 18, 2017; accepted January 1, 2018