
A TAXONOMIC REVISION OF
RHODODENDRON SUBG.
TSUTSUSI SECT. *BRACHYCALYX*
(ERICACEAE)¹

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ABSTRACT

Section *Brachycalyx* Sweet comprises nearly 30 species in *Rhododendron* L. subg. *Tsutsusi* (Sweet) Pojark. (Ericaceae) and is mainly distributed from China to Japan as well as eastern Asia. A taxonomic revision of section *Brachycalyx* is proposed and eight species with one subspecies are recognized. *Rhododendron dilatatum* Miq. var. *decandrum* Makino is newly recognized at the new rank of subspecies as *R. dilatatum* subsp. *decandrum* (Makino) X. F. Jin & B. Y. Ding. Lectotypes are designated for *R. dilatatum* var. *glaucum* Hatus., *R. farrerae* Tate ex Sweet var. *leucotrichum* Franch., *R. mariesii* Hemsl. & E. H. Wilson, *R. reticulatum* D. Don ex G. Don, and *R. wadanum* Makino.

Key words: China, East Asia, Ericaceae, Japan, *Rhododendron* sect. *Brachycalyx*.

The genus *Rhododendron* L. (Ericaceae), which is well known as a group of alpine flowers, contains about 1000 species worldwide (Chamberlain et al., 1996; Fang et al., 2005). The Sino-Himalayan, southwest China, and northern Burma regions are the largest diversity centers, with western Sichuan, northwestern Yunnan, and southeastern Tibet considered the genetic center (Ming & Fang, 1979). *Rhododendron*, as it was first established, appeared with *Azalea* L. (Linnaeus, 1753). Salisbury retained *Azalea* within *Rhododendron*, which is now followed widely (Philipson & Philipson, 1973). In terms of infrageneric ranks, the genus posed systematic problems (Kurashige et al., 2001). Maximowicz (1870) published his *Rhododendreae Asiae Orientalis*, which took the greatest step forward on classification (Philipson & Philipson, 1973). He used the position of flower buds and their relationship with leaf buds to divide the infrageneric ranks, which contained eight sections. Hooker's treatment of *Rhododendron* in

Genera Plantarum was similar to Maximowicz, but he used series as the subdivision ranks (Hooker, 1876). Sleumer (1949, 1980) recognized eight subgenera using the following characters: relationship of flower buds and leaf buds, habitat, flower structure, and lepidote or non-lepidote leaves. He divided the lepidote group into three subgenera. Cullen and Chamberlain (1978, 1979) and Philipson and Philipson (1982) presented a synopsis of infrageneric division. Their taxa were mainly based on Sleumer's classification, but the few changes were for the better.

Rhododendron sect. *Brachycalyx* Sweet was first proposed by Tate, based on a typified Chinese species, *R. farrerae* Tate ex Sweet. Unfortunately, Tate placed *R. dauricum* L., a deciduous but lepidote taxon, in this section. Tate also used Kaempfer's name *Tsutsusi* for the azalea section. De Candolle treated the evergreen azaleas as a section (section *Tsutsusi* Sweet) of *Rhododendron*, but Philipson and Philipson (1973) placed *R. farrerae* in their Eurhododendron

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group. Maximowicz (1870) was innovative in that he used the character of flower buds. The evergreen/Indian azaleas, which have terminal flower buds, formed section *Tsusia* Maxim., this name restricted to these species. The features of buds are often difficult to observe, and Maximowicz failed to explain his species, *R. schlippenbachii* Maxim. (Philipson & Philipson, 1973). Until now, the placement of *R. schlippenbachii* is still confused (Philipson & Philipson, 1982; He, 1994; Judd & Kron, 1995; Yamazaki, 1996; He & Chamberlain, 2005). Wilson and Rehder (1921), in *A Monograph of Azaleas*, proposed section *Sciadorhodion* Rehder & E. H. Wilson to replace section *Brachycalyx*. Section *Sciadorhodion* was accepted by Kitamura and Murata (Kitamura, 1971) and Judd and Kron (1995), but later was combined at the subgeneric rank (Yamazaki, 1993, 1996). Nakai (1924, 1927) posed another section name, section *Verticillata* Nakai, and species of this section have mixed flower and leaf buds except in *R. schlippenbachii*. In Sleumer's system, section *Brachycalyx* was placed in subgenus *Tsutsusi* (Sweet) Pojark., with section *Tsusiopsis* Sleumer established as a new section. Section *Tsusiopsis*, the third section to be established, had evergreen leaves and leaves 2-opposite or 3-verticillate at the apices of branchlets (Sleumer, 1949, 1980). Spethmann (1987) treated subsection *Brachycalyces* Spethmann within subgenus *Pentanthera* (G. Don) Pojark. sect. *Tsutsusi*, and posed subsection *Tashiroia* (Rehder) Spethmann instead of section *Tsusiopsis*. Chamberlain and Rae (1990) retained section *Tsusiopsis* to section *Tsutsusi*, but Yamazaki (1993, 1996) retained it to subgenus *Sciadorhodion* (E. H. Wilson & Rehder) T. Yamazaki (Table 1).

During a recent visit to three herbaria (TI, KYO, and TNS) in Japan, the first author was able to examine all collections of subgenus *Sciadorhodion* (sensu Yamazaki, 1993, 1996). We found that it was advisable to use the character of the relationship of flower buds and leaf buds. Herein, we used Sleumer's category to delimit section *Brachycalyx*. Furthermore, analysis of *matK* and *trnK* intron sequences revealed that *Rhododendron tashiroi* Maxim. is allied to *R. farrerae* and *R. wadanum* Makino (Kurashige et al., 2001). The morphological characters of *R. tashiroi* are much closer to those of section *Brachycalyx* than they are to section *Tsutsusi*. Thus, we reduce section *Tsusiopsis* to the synonymy of section *Brachycalyx*. The ITS sequence data and pollen morphology support this taxonomic view as well (Gao et al., 2002a, b).

BRIEF TAXONOMIC HISTORY

As mentioned above, *Rhododendron* sect. *Brachycalyx* initially contained only two species, *R. farrerae*

and *R. dauricum*, with *R. dauricum* now placed in section *Rhododendron* (Cullen, 1980). Don (1834) then described *R. reticulatum* D. Don ex G. Don in *A General History of Dichlamydeous Plants*, and later *R. dilatatum* Miq. would become the third species in this section. During his eastern Asian azalea research, Maximowicz described the species *R. weyrichii* Maxim. and later *R. tashiroi* (Maximowicz, 1870, 1887). *Rhododendron quinquefolium* Bisset & S. Moore was described at around the same time. In the late 19th century, a new variety of *R. dilatatum* was named by Makino (Makino, 1893). From the early 20th century to 1920, Makino and Nakai published several taxa for this section during their research of Japanese plants (Makino, 1917, 1926a, b; Nakai, 1926), and Nakai (1927) placed them all in section *Verticillata* and also made a small revision. Then, five species, namely *R. mayebarae* Nakai & H. Hara, *Azalea amagiana* Makino (= *R. amagianum* Makino), *A. kiyosumensis* Makino (= *R. kiyosumense* Makino), *R. viscistylum* Nakai, and *R. sanctum* Nakai were designated (Makino, 1931; Nakai, 1932, 1935; Hara, 1935). Hara (1948) made an enumeration of Japanese seed plants, which provided a detailed list of Japanese *Rhododendron* and also proposed several new names. In *Flora of Japan*, Ohwi's treatment was very similar to Hara's, but some varieties and forms were neglected (Ohwi, 1953). Kitamura and Murata (1971) published *Coloured Illustrations of Woody Plants of Japan*; their broader-scale understanding of the Japanese *Rhododendron* led to fewer taxa than Hara and Ohwi. Later, Hara (1974) described *R. hidakanum* H. Hara and placed the species in section *Brachycalyx*. Yamazaki was regarded as the most comprehensive taxonomist across section *Brachycalyx*, not only because he proposed many new species, varieties, and combinations, but also because he investigated this section and presented a new system (Yamazaki, 1981, 1984, 1987a, b, 1988, 1991, 1993, 1996).

Several species of section *Brachycalyx* were discovered in China. Hemsley and Wilson (1907) designated *Rhododendron mariesii* Hemsl. & E. H. Wilson as a new species, which was collected in northwestern Hubei and widely distributed in the drainage area of the Yangtze River (Fang, 1935). Hayata studied the collections from Taiwan and named *R. shojoense* Hayata and *R. gnaphalocarpum* Hayata (Hayata, 1913; Yamazaki, 1996). Tam Pei-Cheung investigated rhododendrons in southern China and described *R. cinereoserratum* P. C. Tam and *R. daiyunicum* P. C. Tam as new species (Tam, 1982). However, *R. daiyuenshanicum* P. C. Tam later replaced *R. daiyunicum* (Tam, 1983). Ding and Fang (1990) discovered *R. huadingense* B. Y. Ding & Y. Y. Fang, with this name not validly published until 2005,

Table 1. Different systematic positions of *Rhododendron* sect. *Brachycalyx*, together with subgenus *Tsutsusi*.

Wilson & Rehder, 1921	Nakai, 1927	Sleumer, 1949, 1980	Philipson & Philipson, 1982	Spethmann, 1987	Chamberlain & Rae, 1990	Yamazaki, 1993, 1996	He & Chamberlain, 2005
	subg. <i>Tsutsusi</i> (Sweet) Pojark. sect. <i>Tsutsusi</i> Sweet	subg. <i>Tsutsusi</i> (Sweet) Pojark. sect. <i>Tsutsusi</i> Sweet	sect. <i>Tsutsusi</i> G. Don	subg. <i>Tsutsusi</i> (Sweet) Pojark. subsect. <i>Obtusa</i> (Rehder) Spethmann	subg. <i>Tsutsusi</i> (Sweet) Pojark. sect. <i>Tsutsusi</i> Sweet (including <i>R.</i> <i>tashiroi</i> Maxim.)	subg. <i>Tsutsusi</i> (Sweet) Pojark. sect. <i>Tsutsusi</i> Sweet sect. <i>Tschonoskia</i> T. Yamaz. subg. <i>Sciadorhodion</i> (E. H. Wilson & Rehder) T. Yamaz.	
	<i>Rhododendron</i> <i>tashiroi</i> Maxim. in sect.						
sect. <i>Tsutsusi</i> Sweet	sect. <i>Verticillata</i> Nakai	sect. <i>Tsutsiopsis</i> Sleumer sect. <i>Brachycalyx</i> Sweet	sect. <i>Tsutsiopsis</i> Sleumer sect. <i>Brachycalyx</i> Sweet	subsect. <i>Tashiroia</i> (Rehder) Spethmann subsect. <i>Brachycalyces</i> (Sweet) Spethmann sect. <i>Sciadorhodion</i> Rehder & E. H. Wilson (sensu Spethmann = <i>R.</i> <i>pentaphyllum</i> Maxim.– <i>R.</i> <i>schlippenbachii</i> Maxim.)	sect. <i>Brachycalyx</i> Sweet	sect. <i>Sciadorhodion</i> T. Yamaz. sect. <i>Quinquefolia</i> T. Yamaz.	sect. <i>Tsutsiopsis</i> Sleumer sect. <i>Brachycalyx</i> Sweet
sect. <i>Sciadorhodion</i> Rehder & E. H. Wilson (including <i>R. schlippenbachii</i> Maxim.)							sect. <i>Sciadorhodion</i> Rehder & E. H. Wilson

since two collections were cited as type (Ding & Jin, 2005). Further examination of the type and observation of seed coat and pollen revealed that *R. huadingense* should belong to section *Pentanthera* G. Don (Jin, 2006). Ding and Fang (1989a) also named a white-flowered form of *R. mariesii* when they surveyed the rhododendrons in Zhejiang, eastern China. Kurashige (1999) published *R. chilanshanense* Y. Kurashige, which was collected in Taiwan.

Chamberlain and Rae (1990) revised the entire subgenus as a section of *Rhododendron* subg. *Tsutsusi*, but left four species of section *Brachycalyx* in doubt. Yamazaki (1996) later revised this group, which was distributed in Japan, Korea, and Taiwan. Many specimens of *R. farrerae* were examined, but herein we cite only two or three specimens from the same locality rather than a comprehensive listing.

MORPHOLOGICAL CHARACTERS

We discuss the principal diagnostic characters used to identify members of *Rhododendron* sect. *Brachycalyx* (Chamberlain & Rae, 1990; Yamazaki, 1993, 1996; He, 1994; He & Chamberlain, 2005).

HABIT

From previous reports, all species of *Rhododendron* sect. *Brachycalyx* are deciduous shrubs, except *R. tashiroi*. Based on specimen examination, we found *R. tashiroi* and *R. daiyunicum* to be evergreen, with leaves that may be persistent in winter. The deciduous shrub species are commonly less than 5 m tall and as shrubs are typically ramified.

LEAF

Leaves are generally verticillate at the top of young shoots. Most species in this section have leaves in a whorl of three, but the leaves of *Rhododendron quinquefolium* are 5-verticillate. The leaves of *R. tashiroi* are sometimes opposite or 3-verticillate, and leaves of *R. reticulatum* var. *bifolium* T. Yamaz. are also 3-verticillate, with one blade lanceolate or setaceous and much smaller than the other two. The leaf shape is usually ovate or triangular-ovate, but shapes may be variable, especially for widespread species (e.g., *R. reticulatum* and *R. mariesii*), with their leaves ranging from oblong to ovate-elliptic. *Rhododendron tashiroi* is the only taxon known to have coriaceous leaves, with other taxa in the section having chartaceous or thickly chartaceous blades. Leaf apices are often acute or acuminate and terminate in a mucro or gland. Leaf margins are minutely denticulate, or sometimes inconspicuous, and those of *R. quinquefolium* are ciliate.

Indumentum on the leaf dorsal surface is variable. Yamazaki distinguished some taxa mainly by the villose pubescence on the dorsal midribs (Yamazaki, 1993, 1996), but we found this to be a fallible character for some species identification. From fieldwork, it was ascertained that *Rhododendron weyrichii*, *R. dilatatum*, and *R. osuzuyamense* T. Yamaz. are characterized by glands on dorsal surfaces of immature leaf blades.

Petiole length ranges from 2–10 mm. *Rhododendron farrerae* differs from *R. mariesii* mainly in its shorter but pubescent petioles. Examination of specimens revealed considerable overlap, with the petiole indumentum in various patterns. Four types of indumentum can be recognized: (1) glabrous (*R. quinquefolium*); (2) densely villose (*R. amagianum* and *R. sanctum*); (3) densely or sparsely soft pubescent (*R. nudipes* Nakai and related taxa); and (4) glandular, stipitate-glandular, or sometimes with sparse soft trichomes (*R. weyrichii*, *R. dilatatum*, and related taxa).

PEDICEL

Pedicels range from 5–10 mm and usually elongate when fruiting, with the pedicels of *Rhododendron huadingense* often 12–20 mm in length. The indumentum of pedicels correlates with that seen for petioles.

INFLORESCENCE

Inflorescences of the species in *Rhododendron* sect. *Brachycalyx* have from one to three (to four) flowers, in terminal umbels. Yamazaki (1993, 1996) used the character of solitary flowers to identify *R. osuzuyamense*, *R. hyugaense* (T. Yamaz.) T. Yamaz., *R. viscistylum*, and *R. amakusaense* (Takada ex T. Yamaz.) T. Yamaz. Species seen in Kyushu, Japan, revealed that this character was not consistently reliable, as *R. osuzuyamense*, *R. hyugaense*, *R. amakusaense*, and *R. viscistylum* sometimes had 2-flowered umbels. Occasionally, *R. mayebarae* and *R. nudipes* have only a single flower as a reduced inflorescence (Minamitani, 1984).

FLOWER

Flowers in *Rhododendron* sect. *Brachycalyx* appear prior to or with leaf emergence, ranging from late February to early June. Within a species, flowering time is mainly impacted by altitude (Minamitani, 1984). Flowers of three species (*R. sanctum*, *R. amagianum*, and *R. quinquefolium*) appear in May to mid-July, opening after the leaves appear. This character has been used frequently to distinguish species in Japan.

Only *Rhododendron daiyunicum* has distinct calyx lobes ca. 5 mm (Tam, 1982), but the species type shows an indistinct calyx. Calyces of all species in *Rhododendron* sect. *Brachycalyx* are minute (3–4 mm diam.), with the lobes inconspicuous or slightly conspicuous (e.g., *R. quinquefolium*). The calyx indumentum correlates with that seen on the pedicels.

Corollas are funnellform or rotate-funnelform, and the corolla tubes are conspicuous. Colors are variable, e.g., pale pink, rose-pink, lilac, purple, reddish purple to red, rarely white. Most species have dark blotches on the upper internal surface of the corolla, but rarely pale blotches occur (e.g., *Rhododendron osuzuyamense*). Corolla length is from 20–35 mm, but some species reach 40–50 mm (e.g., *R. weyrichii* and *R. amagianum*). Corolla lobes are oblong or elliptic, deeply divided, and spreading.

Stamens are five to 10 in section *Brachycalyx*, with only *Rhododendron dilatatum* having five stamens. The remaining species have 10 stamens, but occasionally eight or nine stamens may be seen in flowers. The stamens are generally unequal and are shorter than or equal to the corolla in length. Anthers are ellipsoid, 2–3 mm long; filaments are glabrous or rarely sparsely pubescent on the lower half (e.g., *R. viscistylum*). Only *R. quinquefolium* has filaments that are densely pubescent in their lower third. *Rhododendron farrerae* was described with its filaments having glandular trichomes on the lower half (He, 1994; He & Chamberlain, 2005), but Fang (1935) and our investigation indicate the filaments to be glabrous (Ding & Fang, 1989b).

Styles in *Rhododendron* sect. *Brachycalyx* are 25–50 mm long, usually curved at the base, and longer than or equal to the corolla in length. The stylar indumentum is variable as well, but most members in section *Brachycalyx* have glabrous styles. Styles of *Rhododendron amagianum* and *R. sanctum* are occasionally basally hirsute; *R. wadanum* has styles glandular on the lower half.

Ovary shapes are almost ovoid versus oblong-ovoid (only *Rhododendron dilatatum*). Three types of ovary indumentum are recognized: (1) glabrous (e.g., *R. quinquefolium*); (2) with dense or sparse soft trichomes (e.g., *R. farrerae*, *R. mariesii*, *R. reticulatum*, *R. lagopus* Nakai, *R. nudipes*, *R. wadanum*, *R. sanctum*, *R. weyrichii*); and (3) sparsely to densely glandular-pubescent, sometimes with sparse soft trichomes (e.g., *R. dilatatum*, *R. hyugaense*, *R. osuzuyamense*, *R. viscistylum*, *R. chilanshanense*).

CAPSULE

The size and shape of the capsule are variable both within infraspecies and among species in *Rhododen-*

dron sect. *Brachycalyx*. Capsules are usually obliquely cylindrical, rarely broadly ellipsoid (e.g., *R. hyugaense* and *R. quinquefolium*). The indumentum is similar to the indumentum of the ovaries, and that of *R. quinquefolium* is glabrous. Members of *Rhododendron* ser. *Dilatata* T. Yamaz. (sensu Yamazaki, 1993, 1996) always have capsules with glandular indumentum, occasionally with sparse trichomes. Capsules in this section are otherwise sparsely or densely hirsute, and trichomes may be conspicuously spreading (e.g., *R. reticulatum*, *R. mayebarae*, and *R. mariesii*).

SEED

Seeds in *Rhododendron* sect. *Brachycalyx* are very small, brown, and without wings. Morphological characters of seeds for four species were available to us, namely *R. reticulatum*, *R. tashiroi*, *R. quinquefolium*, and *R. mariesii*. The surface cells of *R. quinquefolium* are protruding, short, and broad versus slightly concave, long, and narrow (Ding et al., 1995; Yamazaki, 1996).

MATERIALS AND METHODS

Over 10,000 collections of *Rhododendron* sect. *Brachycalyx* preserved in 30 herbaria (B, CCTM [Herbarium of the Institute of Canton Chinese Traditional Medicine], CDBI, FJFC, FMP, FNU, GXMI, GZTM, HGAS, HHBG, HNNU, HTC, HZU, IBK, IBSC, KUN, KYO, LBG, N, NAS, NF, P, PE, SCFI, SZ, TI, TNS, W, ZJFC, and ZM) were examined. Descriptions for each species were based on these specimens. It was not possible to examine specimens of *R. chilanshanense*, and this species is described principally from the original description (Kurashige, 1999) and the subsequent *Flora of China* treatment (He & Chamberlain, 2005). Leaf blade measurements were taken from fruiting collections, and descriptions of indumentum were taken from these mature specimens as well. The lengths of both the corollas and fruits were measured from the calyx apices to the corolla or capsule apices. Corolla colors were taken mainly from collection notes, Yamazaki's (1993, 1996) observations, and our fieldwork. Taxa in Japan are recognized according to Yamazaki's concept (Yamazaki, 1993, 1996).

For infraspecific rank, we recognize only subspecies, but this differentiation intergrades among taxa. Our subspecies concept embodies a geographical differentiation across regions and is not altitudinally delimited. In section *Brachycalyx*, taxa with white flowers had been previously designated as variety or form (Ding & Fang, 1989a; Yamazaki, 1993, 1996), and these two infraspecific ranks were frequently used to describe the

variation for a single character such as the corolla color. These taxonomic entities often encompass few individuals, limited to the population level, and are better suited for horticultural recognition.

Specimen localities in China are resolved to the counties (-xian) or mountains (-shan), and those in Japan are often called -gun or -yama/mura, respectively.

TAXONOMIC TREATMENT

Rhododendron L., Sp. Pl. 1: 392. 1753. TYPE:
Rhododendron ferrugineum L.

Azalea L., Sp. Pl. 1: 150. 1753. TYPE: *Azalea indica* L.
[= *Rhododendron indicum* (L.) Sweet].

Trees or shrubs, terrestrial or sometimes epiphytic; indumentum various (see Seith & Hoff, 1980), with peltate scales, glabrous, or sometimes with trichomes. Leaves evergreen, deciduous, or semi-evergreen, alternate, sometimes aggregated at branchlet apex. Inflorescence racemose or corymbose, terminal or sometimes lateral, 1- to 30-flowered. Calyx 5- to 8-lobed, lobes minute and triangular to large and conspicuous, sometimes reduced to a rim; corolla funnellform to campanulate, occasionally rotate-campanulate, regular or slightly zygomorphic, 5 (to 8)-lobed; stamens 5 to 10, rarely 15 to 20 (to 27), inserted at base of corolla, generally declinate; filaments linear, glabrous or basally pilose; anthers without appendages, opening from terminal or oblique pores; ovary usually 5-locular, rarely 6- to 20-locular, with trichomes and/or scales, rarely glabrous; style straight or declinate to deflexed, persistent; stigma capitate, crenate to lobed. Capsule dehiscing from the apex and moving down, cylindrical, coniform, or ovoid, sometimes curved; valves ligneous, thick or thin, straight or twisted. Seeds numerous, minute, fusiform, always winged, or with appendages or threadlike tails on both ends, rarely without appendages.

Rhododendron sect. **Brachycalyx** Tate ex Sweet, Brit. Fl. Gard. ser. 2, 1: 95. 1831. *Rhododendron* subsect. *Brachycalyces* (Sweet) Spethmann, Pl. Syst. Evol. 157: 28. 1987. TYPE: *Rhododendron farrerae* Tate ex Sweet.

Rhododendron ser. *Dilatata* T. Yamaz., Fl. Jap. (Iwatsuki et al., eds.) (ed. 2) 3a: 32. 1993. TYPE: *Rhododendron dilatatum* Miq.

Rhododendron ser. *Glangulistyla* T. Yamaz., Fl. Jap. (Iwatsuki et al., eds.) (ed. 2) 3a: 34. 1993. TYPE: *Rhododendron wadamum* Makino.

Rhododendron ser. *Nudipes* T. Yamaz., Fl. Jap. (Iwatsuki et al., eds.) (ed. 2) 3a: 35. 1993. TYPE: *Rhododendron nudipes* Nakai [= *Rhododendron farrerae* Tate ex Sweet].

Rhododendron sect. *Quinquefolia* T. Yamaz., Fl. Jap. (Iwatsuki et al., eds.) (ed. 2) 3a: 30. 1993. TYPE: *Rhododendron quinquefolium* Bisset & S. Moore.

Rhododendron ser. *Reticulata* T. Yamaz., Fl. Jap. (Iwatsuki et al., eds.) (ed. 2) 3a: 37. 1993. TYPE: *Rhododendron reticulatum* D. Don ex G. Don [= *Rhododendron farrerae* Tate ex Sweet].

Rhododendron ser. *Sciadorhodon* T. Yamaz., Fl. Jap. (Iwatsuki et al., eds.) (ed. 2) 3a: 31. 1993. TYPE: *Rhododendron farrerae* Tate ex Sweet.

Rhododendron sect. *Tsusiopsis* Sleumer, Bot. Jahrb. Syst. 74: 552. 1949. *Rhododendron* subsect. *Tashiroia* (Rehder) Spethmann, Pl. Syst. Evol. 157: 28. 1987. TYPE: *Rhododendron tashiroi* Maxim.

Rhododendron sect. *Verticillata* Nakai, Trees Shrubs Japan (ed. 1): 43. 1922. TYPE: *Rhododendron reticulatum* D. Don ex G. Don [= *Rhododendron farrerae* Tate ex Sweet].

Rhododendron ser. *Weyrichia* T. Yamaz., Fl. Jap. (Iwatsuki et al., eds.) (ed. 2) 3a: 31. 1993. TYPE: *Rhododendron weyrichii* Maxim.

Shrubs deciduous or evergreen; shoots verticillate or subverticillate, glabrous or pubescent. Leaves chartaceous or thin-chartaceous, glandular, villose, or silky-pubescent when young, glabrescent or partly glabrescent later. Both flowers and leaves emerge from the same mixed buds. Inflorescence 1- to 4-flowered; corymb terminal. Calyx lobes minute, only to 2 mm; corolla rotate-funnelform or funnellform, pale purple, pink, lilac-purple, purplish red to reddish purple or red, rarely white, often with dark blotches or spots inside and glabrous on outer surface; stamens 5 to 10, unequal; filaments glabrous, or rarely with pubescence on lower half; ovary villose and/or glandular, sometimes glabrous; style generally glabrous, rarely glandular and/or villose on lower half. Capsules oblong-ovoid to cylindrical, rarely ovoid, sometimes slightly curved. Seeds numerous, minute, brown.

Distribution. *Rhododendron* sect. *Brachycalyx* comprises nine taxa (eight species and one subspecies), with three species distributed in China, six species and one subspecies in Japan, and one species in South Korea.

Discussion. *Rhododendron* sect. *Sciadorhodon* Rehder & E. H. Wilson (Wilson & Rehder, 1921: 79) and *Azalea* subg. *Sciadorhodon* (Rehder & E. H. Wilson) Copeland (1943: 597), with *R. quinquefolium* as the type, could be encompassed within section *Brachycalyx* with the exception of the species *R. schlippenbachii*.

KEY TO SPECIES OF *RHODOENDRON* SECT. *BRACHYCALYX*

- 1a. Leaves evergreen, coriaceous, opposite in pairs or 3-verticillate 6. *R. tashiroi*
1b. Leaves deciduous, chartaceous, 3-verticillate or 5-verticillate.
2a. Leaves 5-verticillate; pedicels and ovaries glabrous 5. *R. quinquefolium*

- 2b. Leaves 3-verticillate; pedicels and ovaries glandular, glandular-pilose, and/or hirsute.
- 3a. Styles glandular, or somewhat sparsely villose on lower half.
 - 4a. Ovaries villose, without glands, not viscosus; style glandular only 7. *R. wadanum*
 - 4b. Ovaries villose, with glands, viscosus; style glandular, intermixed with sparse villose trichomes 2. *R. chilanshanense*
- 3b. Styles glabrous or sparsely hirsute at base.
 - 5a. Flowers opening after leaf emergence; petioles and blade midribs densely villose; lamina rhomboidal 1. *R. amagianum*
 - 5b. Flowers opening usually before or with leaf emergence; pedicels and blade midribs glabrous, villose, and/or glandular; lamina usually ovate to triangular-ovate.
 - 6a. Ovaries villose, without glands, not viscosus.
 - 7a. Corollas red, 35–40 mm long; leaves glandular when young 8. *R. weyrichii*
 - 7b. Corollas rose-pink, lilac, to pale purple, rarely white, 22–35 mm long; leaves silky-pubescent when young 4. *R. farrerae*
 - 6b. Ovaries villose but with glands, viscosus 3. *R. dilatatum*

1. *Rhododendron amagianum* Makino, J. Jap. Bot. 7: 21. 1931. *Rhododendron weyrichii* Maxim. var. *amagianum* (Makino) Hatus., Sci. Rep. Yokosuka City Mus. 15: 23. 1969. TYPE: Japan. Honshū: Pref. Idzu, Mt. Amagi, *T. Makino s.n.* (holotype, MAK!). Figure 1.

Rhododendron sanctum Nakai, Bot. Mag. (Tokyo) 46: 630. 1932. *Rhododendron weyrichii* Maxim. var. *sanctum* (Nakai) Hatus., Sci. Rep. Yokosuka City Mus. 15: 23. 1969, syn. nov. TYPE: Japan. Honshū: Pref. Ise, June 1932, *A. Ando s.n.* (lectotype, designated by Yamazaki, 1996: 89, TII!).

Rhododendron sanctum Nakai f. *albiflorum* T. Yamaz., Revis. Gen. Rhododendron Japan, Taiwan, Korea & Sakhalin 90. 1996. TYPE: Japan. Honshū: Pref. Toonoe (Pref. Shizuoka), Inasa-gun, Shizutama-mura, cultivated in Tokyo, 22 May 1995, *T. Yamazaki 54970* (holotype, TII!).

Rhododendron sanctum Nakai var. *lasigema* Nakai ex Sugim., Key Tr. & Shr. Jap. (ed. 1): 304. 1936. TYPE: Japan. Honshū: Pref. Toonoe (Pref. Shizuoka), Inasa-gun, Shizutama-mura, May 1935, *J. Sugimoto s.n.* (holotype, TII!).

Shrubs deciduous, 2–4 m tall, sometimes to 6 m; young shoots densely pilose. Leaves chartaceous, in a whorl of 3 (3-verticillate), rhombic or rhombic-ovate, 5–8 × 2.5–7 cm, acute or acuminate, with an apical gland, cuneate or rounded at base, entire, blades dorsally glabrous except midribs villose, ventrally pubescent, later becoming glabrous; petioles 3–7(–10) mm, densely villose. Inflorescences 2- or 3-flowered; pedicels 5–10 mm, villose. Calyx bowl-shaped, ca. 3 mm diam., villose, lobes inconspicuous; corolla purplish red or red, rarely white, broadly funnelform, 35–45 × 40–50 mm, deeply 5-divided, tube 10–15(–18) mm, glabrous on both surfaces, lobes elliptic or oblong, 25–32 × 13–20 mm, upper lobes with dark purplish red spots at base; stamens 10, rarely 8 or 9, unequal in length, 20–45 mm, filaments glabrous, anthers oblong, 2–2.5 mm; ovary ovoid, densely villose; style 35–50 mm, glabrous or sparsely hirsute at base. Capsule obliquely cylindrical, 12–

17(–20) × 5–7 mm, densely hirsute; seeds 1.5–2 × ca. 0.5 mm.

Distribution and habitat. *Rhododendron amagianum* is restricted to Izu Ōshima and the adjacent mainland of Japan. It grows in forests at elevations of 300–1000 m above sea level (a.s.l.).

Phenology. *Rhododendron amagianum* flowers from late May to mid-July, with the flowers opening after the emergence of leaves. It fruits from late September to early December.

Discussion. *Rhododendron amagianum* is a remarkable taxon in that its flowers open after the emergence of the leaves. Furthermore, its petioles and midribs are densely villose, and the leaves are rhombic or rhombic-ovate in shape. *Rhododendron amagianum* is similar to *R. weyrichii*, another Japanese species in section *Brachycalyx*, in having red flowers and the leaves also being rhombic-ovate. *Rhododendron amagianum* differs in its petioles and leaf midribs being densely villose dorsally and in its flowers opening after leaf emergence. In contrast, the petioles of *R. weyrichii* are only sparsely pubescent, the leaf midribs are pubescent on both surfaces and later glabrescent, and the flowers open before or with the leaves.

Rhododendron sanctum was published as a new species based on its leaves being slightly smaller, with shorter flowering buds than *R. amagianum*, and the styles sparsely hirsute at the base (Nakai, 1932). The TII lectotype, which was designated by Yamazaki in 1996, reveals glabrous styles. Using Nakai's diagnostic characters, we can hardly distinguish *R. amagianum* from *R. sanctum*. Considering the similar morphology and distribution, we reduce *R. sanctum* and its related taxa to the synonymy of *R. amagianum*.

Additional specimens examined. JAPAN. Honshū: Pref. Aichi: Horai, Tsugeno, Mt. Zinko, *K. Torii 13969* (KYO); Yana-gun, Tsugeno, *S. Kitamura & G. Murata 335* (KYO). Pref. Kanagawa: Sagami, Hakone, Jukkoku-pass, *S. Okuyama & I. Okamoto s.n.* (TNS); Sagami, Hakone, Mt. Kintokisan, *T. Ookawachi s.n.* (TNS). Pref. Mie: Ise, Mt. Asama, *T. Tashiro 51742* (TNS), *51743* (TNS), *s.n.* (KYO), *M.*

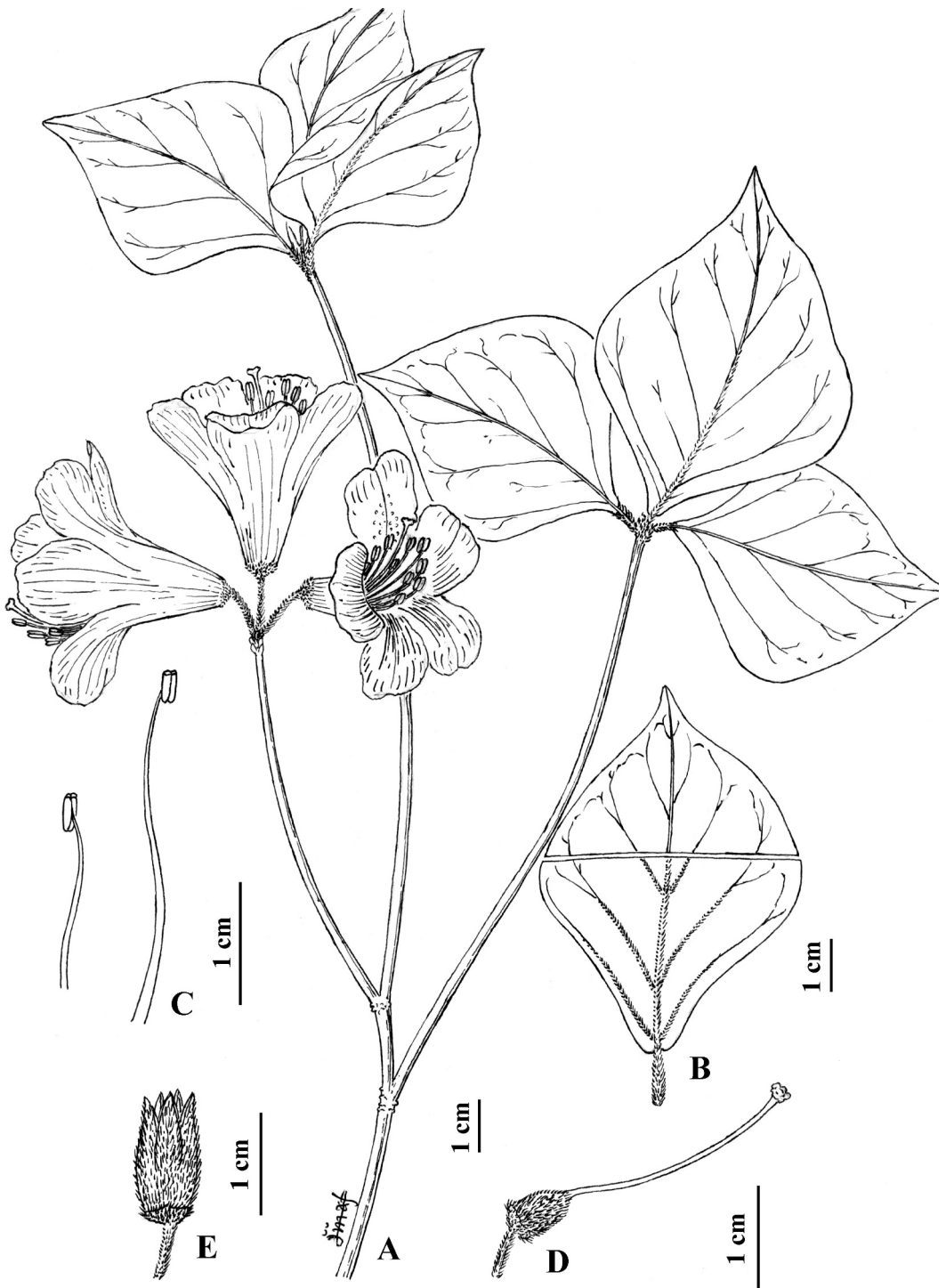


Figure 1. *Rhododendron amagianum* Makino. —A. Flowering shoot. —B. Leaf, showing indumentum. —C. Stamen. —D. Style and ovary. —E. Capsule. A–D from Y. Kimura s.n.; E from Hara s.n.

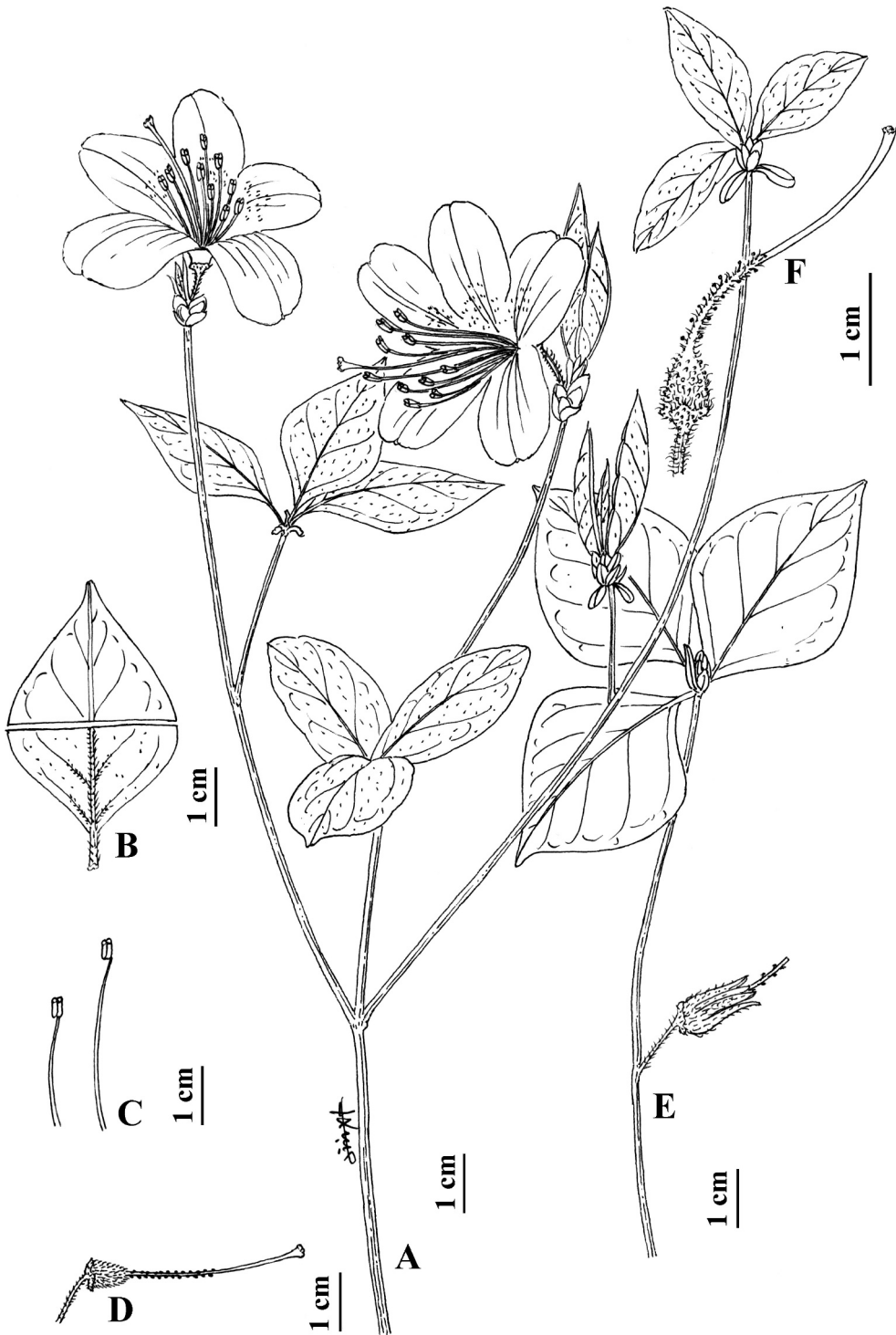


Figure 2. A–E. *Rhododendron wadanum* Makino. —A. Flowering shoot. —B. Leaf, showing indumentum. —C. Stamen. —D. Style and ovary. —E. Fruiting shoot. —F. *Rhododendron chilanshanense* Kurashige. Style and ovary. A–C from Sawada s.n.; D, E from Hara s.n.; F redrawn from Kurashige (1999).

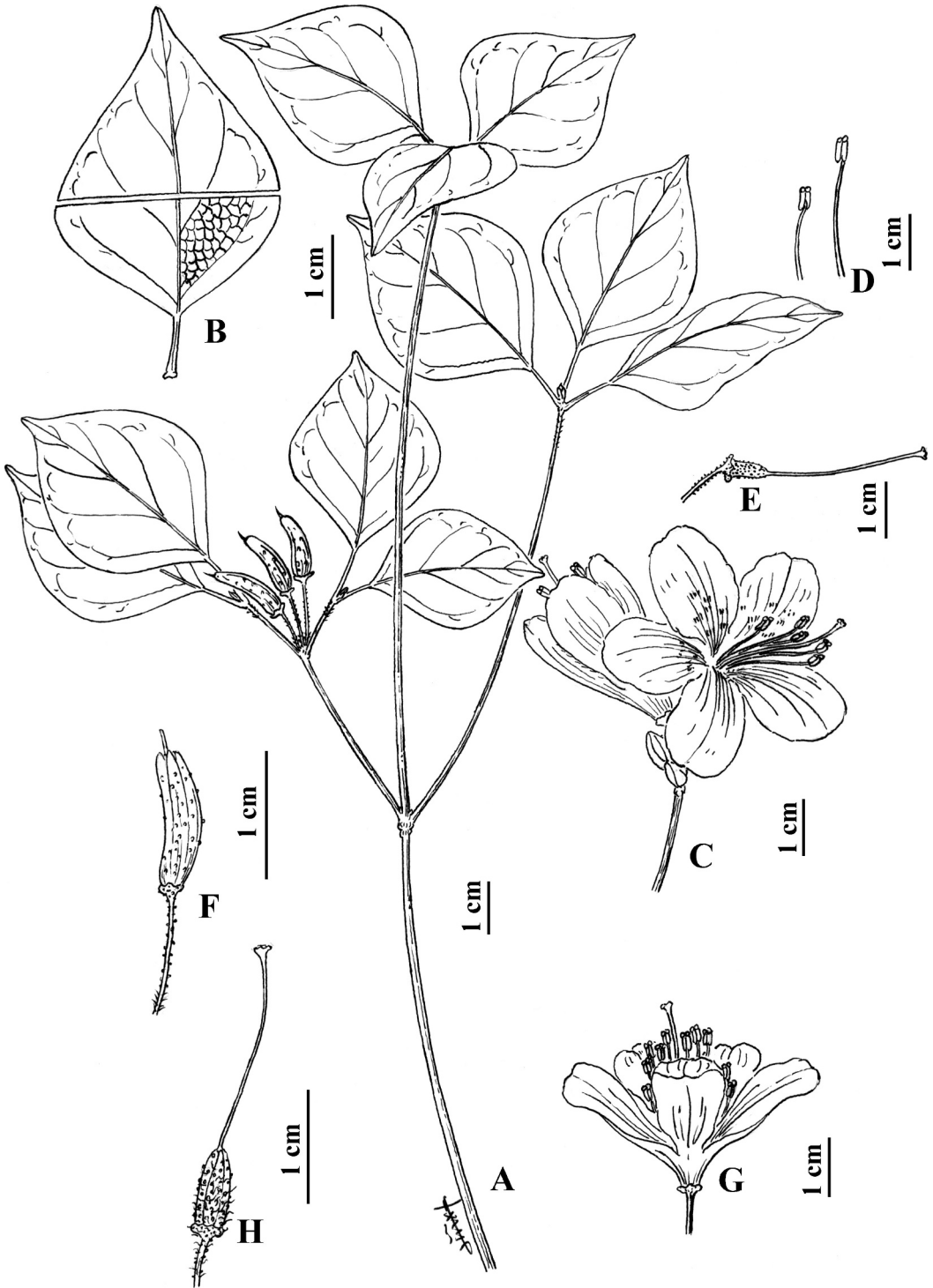


Figure 3. A–F. *Rhododendron dilatatum* Miq. subsp. *dilatatum*. —A. Fruiting shoot. —B. Leaf, showing indumentum. —C. Flowering shoot. —D. Stamen. —E. Style and ovary. —F. Capsule. G, H. *Rhododendron dilatatum* subsp. *decandrum* (Makino) X. F. Jin & B. Y. Ding. —G. Flower. —H. Style and ovary. A, B, F from *J. Murata 11402*; C–E from *X. F. Jin 1408*; G, H from *X. F. Jin 1415*.

Phenology. *Rhododendron dilatatum* subsp. *dilatatum* flowers from mid-March to mid-May, opening before or with the leaves. It fruits from mid-September to October.

Discussion. The typical subspecies of *Rhododendron dilatatum* is remarkable for being the only taxon in section *Brachycalyx* that has five stamens.

Additional specimens examined. JAPAN. **Honshū:** Pref. Aichi: Minamishitara-gun, Horai-cho, Mt. Horaiji, *G. Murata 41058* (KYO), *Nanashi s.n.* (TI); Mikawa, *K. Torii s.n.* (KYO, TI); Mt. Horaiji, *T. Tashiro s.n.* (KYO); Kitashitara-gun, Tomiyama-mura, *G. Murata 7314* (KYO); Kitashitara-gun, Toyone-mura, *K. Torii s.n.* (KYO). Pref. Chiba: Kimitsu-gun, Kazusa-cho, Mt. Kame, Mt. Mitsuishi, *G. Murata & K. Iwatsuki 529* (KYO). Pref. Gifu: Mino-city, Ooyada, from the shrine of Ooyada to the top of Mt. Ten-nou, *H. Takahashi 18573* (TNS); Mino-city, Kataji, near Mt. Okuita, *H. Takahashi & H. Takano 274* (KYO); Mt. Kinka, *J. Murata 11402* (TI); Kamo-gun, Yaotsu-cho, Mine, *H. Takahashi et al. 5222* (KYO); Gujo-gun, Minami-mura, *N. Kurosaki 12564* (KYO). s. loc., *K. Asano & K. Katsumata 16261* (TI). Pref. Gumma: Tano-gun, Onishi-machi, *J. Murata 4643* (KYO), *1662* (KYO); Tano-gun, Manba-machi, *J. Murata et al. 835* (KYO); Tano-gun, Nakazato-mura, Kamigahara, Mt. Kanoosan, *J. Murata et al. 1086* (KYO); Shinusuitoge, *Z. Sato s.n.* (TI); Tano-gun, Nakasato-mura, Hayama-machi, *H. Kanei s.n.* (TI); Nakanodake, Mt. Myogi, *H. Kanai s.n.* (TI); Matuida Onga, *S. Watari s.n.* (TI). Pref. Kanagawa: Hakone, Koziri, *T. Sawada s.n.* (KYO); Hakone, Sokokura, *T. Sawada s.n.* (KYO); Hakone, Mt. Kintoki, *T. Sawada s.n.* (KYO); Atugishi, Kotakuji-onsen, *H. Ohba et al. 40* (TI); Sagami, *H. Kanei s.n.* (TI). Pref. Nagano: Shinano, Shimoina-gun, Ooshikamura, Kamiaokigawa, *K. Asano s.n.* (KYO); Shinano, Shimoina-gun, Ohshika-mura, *H. Kanei et al. s.n.* (TI); Shinano, Shimoina-gun, Iida, Mt. Hontakamori, *T. Yamazaki & K. Asano 7568* (TI); Shinano, Okawara-Sanpukutoge, *S. Saito s.n.* (TI); Usuitoge, *H. Hara s.n.* (TI); Suwa-gun, Fujimi-machi, *Nakayama s.n.* (TI); Tano-gun, Ueno-mura, *T. Yamazaki s.n.* (TI). Pref. Nara: Yoshino-gun, Totsukawamura, *G. Koigumi s.n.* (KYO). Pref. Saitama: Chichibu-shi, Urayama-keikoku, *H. Ohashi et al. 1329* (TI); Chichibu-gun, Ohtaki-mura, Mt. Mitsuimine, *N. Kurosaki 7506* (KYO); Tano-gun, Yano-mura, Mt. Zyomine, *T. Yamazaki s.n.* (TI); Mt. Izugadake, *T. Tuyama s.n.* (TI); Iruma-gun, Hidakamachi, Komahongou, *H. Ohashi et al. 1625* (TI); Iruma-gun, Agano-mura, *H. Kanai & M. Numagata s.n.* (TI); Hano-shi, Neno-gongen, *M. Togashi s.n.* (KYO); Chichibu, Mt. Mitsuimine, *Takawa s.n.* (KYO); Shomarutoge, *J. Ohwi & K. Okamoto 478* (KYO); Hanno-shi, *G. Koigumi s.n.* (KYO). Pref. Shiga: Inukami-gun, Mt. Oikedake, *G. Murata & N. Fukuoka 118* (KYO). Pref. Shimane: Hikawa-gun, Musashi, *Anon. s.n.* (TI). Pref. Shizuoka: Shizuoka-city, Ikawa Lake, *J. Sugimoto et al. 14* (TNS), *32* (KYO); Shizuoka-city, from Sangochi to Abe-pass, Sakasa-gawa, *Y. Kamijo et al. 71* (KYO, TNS); Shizuoka-city, along the Ooya River, from Shinden to Ooginokaname, *E. Miki 16* (KYO); Shizuoka-city, from Magosajima to Ikawa-toge, *E. Miki 28* (KYO); Shizuoka-city, along the Abe River, from Umegashima-onsen to Sekino-sawa, *Y. Kamijo 10* (KYO); Fujinomiya-shi, Kamiide, Asagiri Plateau, western foot of Mt. Fuji, *F. Konta 7989* (TNS); Suruga-gun, *K. Morinaga 3204* (TNS); Nakakawanemachi, *S. Noshiro et al. s.n.* (TI); Fuji-gun, Kamiide-mura, Fumoto, *H. Kanai s.n.* (TI); Iwata-gun, Sakuma-machi, *H. Kanai et al. s.n.* (TI); Sibukoma, *T. Yamazaki 3886* (TI); Mt.

Ogasa, *T. Tashiro s.n.* (KYO), *Y. Kurosawa s.n.* (KYO); Shitagun, Setonoyama-mura, *S. Takahiro s.n.* (KYO), *T. Tashiro s.n.* (KYO). Pref. Tokyo: Nishitama-gun, Nippara, Mt. Tenso, *M. Migushima s.n.* (KYO); Mt. Kumotori, *Anon. s.n.* (TI); Mt. Odake, *S. Okuyama s.n.* (KYO). Pref. Wakayama: Higashimuro-gun, Nachikatsuura-cho, Mt. Nachi, *H. Takahashi 1169* (KYO). Pref. Yamanashi: Minamikoma-gun, Minobu-cho, Mt. Minobu, *N. Kurosaki 12992* (KYO); Minamikoma-gun, Nanbu-machi, Mt. Tenshi, *Y. Tateishi et al. 4578* (KYO, TI, TNS), *Y. Quadota et al. 4592* (TI); Minamikoma-gun, *G. Koigumi s.n.* (KYO); Minamikoma-gun, Nambu-cho, Kozari, *J. Murata et al. 1780* (TI), *Y. Quadota et al. 4592* (KYO); Minamitsuru-gun, Yamanakako-mura, *M. Togashi s.n.* (KYO, TNS), *M. Togashi s.n.* (KYO); Minamitsuru-gun, Kawaguchiko-machi, Yakemage-hara, N foot of Mt. Fuji, *N. Kurosaki 3501* (KYO); Minamitsuru-gun, Mt. Mitsutoge, *T. Shimizu s.n.* (KYO); Minamitsuru-gun, Oshino-mura, Uchino, *M. Togashi s.n.* (KYO); Minamitsuru-gun, Nambu-cho, Kozori, *Y. Quadota et al. 1780* (KYO); Minamitsuru-gun, *M. Togashi s.n.* (TI); Kofu-city, from Anaguchi to Obina, *N. Fukuoka 8159* (KYO); Minamikoma-gun, Minobe-cho, *J. Murata et al. 5585* (TI), *H. Kanei s.n.* (TI); Kai, Nakakoma-gun, Aaiyasumura, *T. Yamazaki 3223* (TI); Kai, *H. Kanei s.n.* (TI); Kai, Minamitsuru-gun, Oshino-mura, Uchino, *M. Togashi s.n.* (KYO); Tsuru-shi, Mt. Kuki, *T. Yamazaki 794* (TI); Kitatsurugun, Hatsukari, *H. Kanai 9413* (KYO, TI); Yamato-mura, from Ohkura-zawa to Komeshoi Pass, *T. Yahara et al. 5938* (KYO); Fuji, Yoshida, *S. Watari s.n.* (TI). **Shikoku:** Pref. Ehime: Uma-gun, Beeshiyama-mura, Mt. Higashiakaishi, *Kazumi Tsuchiya 536* (KYO).

3b. *Rhododendron dilatatum* subsp. *decandrum* (Makino) X. F. Jin & B. Y. Ding, stat. nov. Basionym: *Rhododendron dilatatum* Miq. var. *decandrum* Makino, Bot. Mag. (Tokyo) 7: 134. 1893. *Rhododendron decandrum* (Makino) Makino, J. Jap. Bot. 1: 21. 1917. TYPE: Japan. Shikoku: Pref. Tosa, Ochi, Apr. 1887, *T. Makino s.n.* (holotype, TI!; isotype, MAK not seen, MAK photo!). Figure 3G, H.

Rhododendron decandrum (Makino) Makino f. *lasiocarpum* H. Hara, Enum. Spermatophytarum Japon. 1: 29. 1948, syn. nov. *Rhododendron dilatatum* Miq. var. *lasiocarpum* (H. Hara) T. Yamaz., Fl. Jap. (Iwatsuki et al., eds.) (ed. 2) 3a: 33. 1993. TYPE: Japan. Honshū: Pref. Wakayama, Aritagun, Mt. Yawata, 27 Apr. 1935, *S. Okamoto s.n.* (holotype, KYO!).

Rhododendron decandrum Makino var. *pilosum* H. Hara, Enum. Spermatophytarum Japon. 1: 29. 1948. TYPE: Japan. Honshū: Pref. Mie, Ise, Apr. 1907, *T. Magofuku s.n.* (holotype, TI!).

Rhododendron dilatatum Miq. var. *satsumense* T. Yamaz., J. Jap. Bot. 56: 363. 1981. TYPE: Japan. Kyushu: Pref. Obsumi, Tatakumayama, cult. Tokyo, 1 Apr. 1980, *T. Yamazaki 2534* (holotype, TI!).

Rhododendron hidakanum H. Hara, J. Jap. Bot. 49: 353. 1974, syn. nov. Replaced synonym: *Rhododendron dilatatum* Miq. var. *boreale* Sugim., New Keys Woody Pl. Japan (ed. 2): 509. 1972, nom. illeg. TYPE: Japan. Hikkaido: Hidaka, Maruyama, Shoya, 11 Sep. 1974, *H. Hara et al. s.n.* (holotype, TI!; isotype, TI!).

Rhododendron inobeanum Honda, Bot. Mag. (Tokyo) 43: 383. 1939. TYPE: Japan. Shikoku: Pref. Tokushima, May 1939, *N. Inobe s.n.* (holotype, TI!).

Rhododendron osuzuyamense T. Yamaz., J. Jap. Bot. 59: 208. 1984, syn. nov. Replaced synonym: *Rhododendron dilatatum* Miq. var. *glaucum* Hatus., Sci. Rep. Yokosuka City Mus. 15: 22, 1969. *Rhododendron viscistylum* Nakai var. *glaucum* (Hatus.) Sugim., New Keys Woody Pl. Japan (ed. 2): 509, 1972. TYPE: Japan. Kyūshū: Hyuga, Osuzu, *S. Sako 3384* (lectotype, designated here, TI!).

Rhododendron viscistylum Nakai, Bot. Mag. (Tokyo) 49: 498. 1935, syn. nov. *Rhododendron dilatatum* Miq. var. *viscistylum* (Nakai) Hatus., Sci. Rep. Yokosuka City Mus. 15: 21. 1969. TYPE: Japan. Kyūshū: Pref. Osumi, Takakumayama, 5 June 1932, *J. Sugimoto s.n.* (holotype, TI!).

Rhododendron viscistylum Nakai var. *amakusaense* T. Yamaz., J. Jap. Bot. 59: 208. 1984. *Rhododendron amakusaense* (Takada ex T. Yamaz.) T. Yamaz., J. Jap. Bot. 62: 72. 1987. TYPE: Japan. Kyūshū: Isl. Amakusa, 24 Aug. 1978, *K. Takada s.n.* (holotype, TI!).

Rhododendron viscistylum Nakai var. *hyugaense* T. Yamaz., J. Jap. Bot. 59: 208. 1984. *Rhododendron hyugaense* (T. Yamaz.) T. Yamaz., J. Jap. Bot. 62: 72. 1987. TYPE: Japan. Kyūshū: Pref. Miyazaki, Koyugun, Nishimera, Shiono, 11 Sep. 1978, *K. Takeda 89101* (holotype, KYO!; isotype, TI!).

Calyx densely to sparsely glandular, sparsely pubescent, calyx lobes inconspicuous; corolla pale purple to purple, rarely white, upper lobes with dark purplish or whitish spots; stamens (8 to) 10, unequal in length; ovary densely glandular, sometimes with sparse pubescence. Capsule obliquely cylindrical to oblong-ovoid.

Distribution and habitat. *Rhododendron dilatatum* subsp. *decandrum* is found from Kyūshū to central Honshū provinces, as well as in Hokkaidō (Hidaka), Japan. The subspecies is widely distributed in western Honshū and Shikoku. It grows in thickets, in forests, or on slopes at 100–1400 m a.s.l.

Phenology. *Rhododendron dilatatum* subsp. *decandrum* flowers from late April to mid-May, opening before or with leaf emergence. It fruits from mid-September to mid-November.

Discussion. Subspecies *decandrum* differs from *Rhododendron dilatatum* subsp. *dilatatum* by having twice as many (10) stamens (sometimes only seven to nine). The ovary is covered with glands and is sometimes sparsely pubescent. The distribution area of subspecies *decandrum* is more southern than that of the autonymic subspecies. Because these two infraspecific entities of *R. dilatatum* differ in both morphology and distribution, the infraspecific status is changed here from variety to subspecies.

According to Articles 37.1 and 37.2 (with Art. 8.1) of the *International Code of Botanical Nomenclature* (McNeill et al., 2006), a name published after 1 January 1958 is not validly published if more than one collection is indicated as type. *Rhododendron dilata-*

tum var. *glaucum* was not validly published because two collections, *S. Sako 3384* and *S. Hatusima & S. Sako 31427*, were designated as types. This name was combined as *R. viscistylum* var. *glaucum* in 1972 and replaced with *R. osuzuyamense* in 1984. It can be easily identified by the leaves being whitish green abaxially, and the collection *S. Sako 3384* is more accordant. Herein, this collection is designated as the lectotype for the formal application of these names.

Additional specimens examined. JAPAN. **Hokkaidō:** Pref. Hidaka: Syoa, Mt. Maru, *S. Kurosawa & Y. Tateishi s.n.* (TI); Hidaka, Syoa, *Y. Tateishi & M. Togashi s.n.* (TI), *Y. Jokuuchi s.n.* (TI). **Honshū:** Pref. Hyogo: Isl. Awaji-shima, Sumoto-city, *Sinya Miyake 6330* (KYO), *N. Fukuoka & N. Kurosaki 1575* (KYO); Tsuna-gun, *S. Hosomi 13746* (KYO). Pref. Mie: Ise-shi, Tashiro-dani, *G. Murata 19503* (KYO); Ise, Mt. Yuno, *G. Koizumi s.n.* (KYO); Inabe-gun, Hattamura, *G. Murata 8737* (KYO); Inabe-gun, Fujiwara-mura, Mt. Fujiwara, *G. Murata 20590* (TI); Ise, Mt. Asakuma, *T. Nakai s.n.* (TI), *H. Hara & S. Kurosawa s.n.* (TI); Ise, Momonoki-goya to Fudonotaki, *Y. Mizushima 7268* (TI); Watarai-gun, Nansei-cho, *H. Hara & S. Kurosawa s.n.* (TI); Watarai-gun, Ichinose, Kawakami, *T. Magofuku s.n.* (TI); Komoto, Mt. Yuno, *Yoshii et al. s.n.* (TI); Ise, Komono-cho, Mt. Yuno, *Yoshii et al. s.n.* (TI); Toroha-cho, *H. Hara s.n.* (TI); Mt. Ohdaigahara, *T. Kurokawa s.n.* (TI). Pref. Nara: Yoshinogun, Mt. Takami, *G. Murata 6907* (KYO); Yoshinogun, Shimokitayama-mura, *G. Murata et al. 19* (KYO); Yoshinogun, Mt. Oomine, *G. Murata et al. 37315* (KYO); Yoshinogun, Kamikitayama-mura, Mt. Wasamata to Mt. Daihugen, *G. Murata 22244* (KYO), *22241* (KYO); Yoshinogun, Inter Mt. Sanjogadake and Kotako, *G. Murata & K. Iwatsuki 88* (KYO); Mt. Ohdaigahara, *T. Yamazaki et al. s.n.* (TI), *G. Murata 10128* (KYO). Pref. Osaka: Izumi-shi, Mt. Katsuragi, *Kuwashima s.n.* (KYO); Izumisano-shi, *T. Tashiro s.n.* (KYO). Pref. Shiga: Gamou-gun, Kiakake, *S. Kitamura s.n.* (KYO); Gamou-gun, Mt. Watamuko, *T. Tashiro s.n.* (KYO), *N. Hashimoto s.n.* (KYO); Inukami-gun, Ootaki-mura, *N. Hashimoto s.n.* (TI); Inukami-gun, Mt. Oikedake, *G. Murata & N. Fukuoka 123* (KYO). Pref. Wakayama: Mt. Ooto, Hongu-cho, *N. Naruhashi 1726* (KYO); Arida-gun, *Okamoto 7153* (TI); Arida-gun, Shimizu-cho, *Okamoto s.n.* (KYO); Higashimuro-gun, Kitayama-mura, *H. Kanei s.n.* (TI). **Kyūshū:** Pref. Kagoshima: Osumi, Mt. Takakuma, *H. Idzumi & M. Togashi s.n.* (IBSC, P, TNS), *T. Minamitani 24542* (KYO); Kagoshima, Yoshino, *T. Tashiro s.n.* (KYO); Imuda-ike, *F. Yamazaki s.n.* (TI), *G. Koidzumi s.n.* (TI); Kushikino-shi, *K. Takada s.n.* (KYO); s. loc., *K. Maruno 19238* (TI). Pref. Miyazaki: Koyu-gun, Nishimera-mura, *S. Mitsuta 12504* (KYO); Koyu-gun, Kijo-cho, Ryuma, *T. Minamitani 29417* (KYO), *29422* (KYO); Koyu-gun, Kijo-cho, Matsuo-dam, *T. Minamitani 29394* (KYO); Koyu-gun, Kijo-cho, Mt. Osuzu, *X. F. Jin 1429* (HZU), *1432* (HZU); Nishimera-gun, Yokono, *K. Takada 89106* (KYO), *89104* (KYO), *89102* (KYO), *89103* (KYO); Nishimera-gun, Sugimura, Mamako-daki, *T. Minamitani 29348* (KYO), *29351* (KYO); Nishi-mura, Mt. Kamon-dake, *T. Minamitani 30251* (KYO); Higashiusuki-gun, Mt. Ohkue, *T. Minamitani 28076* (KYO), *21582* (KYO). Pref. Oita: Saekishi, Ohgoshi, *Shigehiko Mashiba 9028* (TI); Minamiyamabe-gun, Yayoi-cho, Mt. Shakuma, *T. Minamitani 23769* (TI); Minamiyamabe-gun, *S. Kurada 574* (TI). **Shikoku:** Pref. Ehime: Nishiuwagun, Mikame-cho, *Y. Nomura 14* (KYO); Nishiuwagun, *Y. Nomura 20* (KYO); Kitauwagun, *J. Murata 15046* (TI),

15047 (TI); Uwajima, *T. Tashiro s.n.* (TI); Kamiukena-gun, Mt. Ishizuchi, *J. Murata & J. Ohno 21337* (TI). Pref. Kagawa: Isl. Syodo-shima, Kankakei, *G. Murata et al. 190* (KYO), *N. Fukuoka 7696* (KYO). Pref. Kochi: Takaoka-gun, Ochi-cho, *H. Koyama & G. Murata 4270* (KYO), *H. Koyama 4249* (KYO), *4254* (KYO), *M. Togashi s.n.* (TNS); Kuroson, *S. Okuyama 15754* (TNS); Godai, *Anon. s.n.* (TNS); Engyouji, *H. Hara 2017* (TI). Pref. Tokushima: Myozai-gun, Kamiyama-cho, Mt. Asahino-maru, *H. Koyama s.n.* (KYO); Myodo-gun, Sanagouchi-mura, *S. Nikai 260245* (TNS); Naka-gun, Kisawa-mura, *G. Murata et al. 56050* (KYO); Miyoshi-gun, Ikedatyou-cho, *S. Takato 1379* (KYO).

4. *Rhododendron farrerae* Tate ex Sweet, Brit. Fl. Gard. ser 2(1): tab. 95. 1831. *Azalea farrerae* (Tate ex Sweet) K. Koch, Dendrologie 2(1): 178. 1872. TYPE: tab. 95 in Sweet, 1831, based on "a cultivated plant introduced from China by Capt. Farrer in 1829" (holotype, Sweet, 1831: tab. 95). Figure 4.

Rhododendron cinereoseratum P. C. Tam, Bull. Bot. Res., Harbin 2(4): 77. 1982. TYPE: China. Fujian: Nanjing Co., Huxi, *Amoy Univ. 20* (holotype, AU!).

Rhododendron daiyunicum P. C. Tam, Bull. Bot. Res., Harbin 2(4): 78. 1982. *Rhododendron daiyuenshanicum* P. C. Tam, Surv. Gen. *Rhododendron* S. China: 28, 96, t. 22: 3. 1983, nom. illeg. superfl. TYPE: China. Fujian: Dehua Co., Mt. Daiyunshan, 20 Apr. 1975, *L. K. Ling 3140* (holotype, FNU!; isotypes, FNU[8]).

Rhododendron farrerae Tate ex Sweet var. *leucotrichum* Franch., J. Bot. (Morot) 9: 394. 1895. TYPE: China. Sichuan, E Sichuan, 1892, *P. Farges 846* (lectotype, designated here, P!).

Rhododendron gnaphalocarpum Hayata, Icon. Pl. Formosan. 3: 132. 1913, syn. nov. TYPE: China. Fujian: Isan, 1910, *T. Nagasawa 239* (holotype, TI!).

Rhododendron kiyosumense Makino, J. Jap. Bot. 6: 18. 1929, syn. nov. *Rhododendron dilatatum* Miq. var. *kiyosumense* (Makino) Hatus., Sci. Rep. Yokosuka City Mus. 15: 22. 1969. TYPE: Japan. Shikoku: Pref. Awa, Mt. Kiyosumi, 22 May 1929, *D. Suzuki s.n.* (lectotype, designated by Yamazaki, 1996: 113, MAK!).

Rhododendron lagopus Nakai, Bot. Mag. (Tokyo) 40: 483. 1926, syn. nov. *Rhododendron wadanum* Makino var. *lagopus* (Nakai) H. Hara, Enum. Sperm. Jap. 1: 78. 1948. *Rhododendron reticulatum* D. Don ex G. Don var. *lagopus* (Nakai) Hatus., Sci. Rep. Yakosuka City Mus. 15: 22. 1969. TYPE: Japan. Honshū: Mt. Daisen, 9 Sep. 1925, *A. Kimura s.n.* (holotype, TI!).

Rhododendron mariesii Hemsl. & E. H. Wilson, Bull. Misc. Inform. Kew 1907(6): 244. 1907, as "Mariesii," syn. nov. TYPE: China. Hubei: western Hubei, Apr. 1900, *E. H. Wilson 29* (lectotype, designated here, P!; isotypes, A not seen, E not seen, W!).

Rhododendron mariesii Hemsl. & Wilson f. *albiscens* B. Y. Ding & G. R. Chen, J. Hangzhou Univ., Nat. Sci. Ed. 16: 198. 1989, syn. nov. TYPE: China. Zhejiang: Qingyuan, Zuoxi, 23 Apr. 1984, *B. Y. Ding & C. M. Cai 3825* (holotype, HZU!).

Rhododendron mayebarae Nakai & H. Hara, J. Jap. Bot. 11: 825. 1935, syn. nov. *Rhododendron nudipes* Nakai var. *mayebarae* (Nakai & H. Hara) Kitam., Acta Phytotax. Geobot. 25: 37. 1972. *Rhododendron viscistylum* Nakai var. *mayebarae* (Nakai & H. Hara) Sugim., New Keys

Woody Pl. Japan. 509. 1972. TYPE: Japan. Kyūshū: Pref. Higo, Mt. Kurobaru, 24 Apr. 1927, *K. Mayebarae 2159* (holotype, TI!; isotype, KYO!).

Rhododendron mayebarae Nakai & H. Hara var. *ohsumiense* T. Yamaz., J. Jap. Bot. 59: 209. 1984, syn. nov. TYPE: Japan. Kyūshū: Pref. Kagoshima, Aranishiyama, 21 July 1978, *K. Takada s.n.* (holotype, TI!).

Rhododendron nagasakianum Nakai, Bot. Mag. (Tokyo) 40: 484. 1926, syn. nov. *Rhododendron nudipes* Nakai var. *nagasakianum* (Nakai) T. Yamaz., Fl. Jap. (Iwatsuki et al., eds.) 3a: 36. 1993. TYPE: Japan. Kyūshū: Pref. Nagasaki, Mt. Unzen, Fugin, 26 Aug. 1925, *Anon. s.n.* (holotype, TI not seen, TI photo!).

Rhododendron nudipes Nakai, Bot. Mag. Tokyo 40: 484. 1926, syn. nov. *Rhododendron reticulatum* D. Don ex G. Don var. *nudipes* (Nakai) Hatus., Sci. Rep. Yakosuka City Mus. 15: 23. 1969. TYPE: Japan. Kyūshū: Kumamoto, Mt. Aso, 19 May 1919, *M. Ogata s.n.* (holotype, TI!).

Rhododendron nudipes Nakai var. *kirishimense* T. Yamaz., J. Jap. Bot. 59: 209. 1984, syn. nov. TYPE: Japan. Kyūshū: Pref. Miyazaki, Mt. Kirishima, Sonoura, 27 Aug. 1972, *T. Minamitani s.n.* (holotype, TI!).

Rhododendron nudipes Nakai subsp. *niphophilum* T. Yamaz., J. Jap. Bot. 56: 363. 1981, syn. nov. *Rhododendron lagopus* Nakai var. *niphophilum* (T. Yamaz.) T. Yamaz., J. Jap. Bot. 63: 410. 1988. TYPE: Japan. Honshū: Oziya Shi, Oziya, cult. Tokyo, 18 May 1974, *T. Yamazaki s.n.* (holotype, TI!).

Rhododendron nudipes Nakai var. *tokushimense* T. Yamaz., J. Jap. Bot. 56: 364. 1981, syn. nov. *Rhododendron lagopus* Nakai var. *tokushimense* (T. Yamaz.) T. Yamaz., J. Jap. Bot. 63: 410. 1988. TYPE: Japan. Shikoku: Pref. Awa, Miyahama Sasatoge, 14 Aug. 1941, *C. Abe s.n.* (holotype, TI!).

Rhododendron nudipes Nakai var. *tsurugisanense* T. Yamaz., J. Jap. Bot. 59: 210. 1984, syn. nov. *Rhododendron lagopus* Nakai var. *tsurugisanense* (T. Yamaz.) T. Yamaz., J. Jap. Bot. 63: 410. 1988. *Rhododendron tsurugisanense* (T. Yamaz.) T. Yamaz., J. Jap. Bot. 66: 125. 1991. TYPE: Japan. Shikoku: Pref. Tokushima, Mt. Tokushimasan, 9 Aug. 1976, *T. Yamazaki 1128* (holotype, TI!).

Rhododendron nudipes Nakai var. *yakumontanum* T. Yamaz., J. Jap. Bot. 56: 364. 1981, syn. nov. *Rhododendron yakumontanum* (T. Yamaz.) T. Yamaz., J. Jap. Bot. 62: 72. 1987. TYPE: Japan. Kyūshū: Pref. Kagoshima, Isl. Yakushima, 9 Aug. 1923, *Z. Tashiro s.n.* (holotype, TI!).

Rhododendron reticulatum D. Don ex G. Don, Gen. Hist. 3: 846. 1834, syn. nov. TYPE: Japan. Honshū: Pref. Tokyo, Rikugien Garden, 22 Apr. 1959, *F. Yamazaki s.n.* (lectotype, designated here, TI!).

Rhododendron reticulatum D. Don ex G. Don var. *bifolium* T. Yamaz., J. Jap. Bot. 62: 288. 1987, syn. nov. *Rhododendron reticulatum* D. Don ex G. Don f. *bifolium* (T. Yamaz.) T. Yamaz., Fl. Jap. (Iwatsuki et al., eds.) (ed. 2) 3a: 37. 1993. TYPE: Japan. Shikoku: Pref. Oshima, Tokushima, 13 July 1957, *K. Abe 35670* (holotype, TI!).

Rhododendron reticulatum D. Don ex G. Don var. *ciliatum* Nakai, Bot. Mag. (Tokyo) 40: 486. 1926, syn. nov. TYPE: Japan. Honshū: Pref. Yamaguchi, Yoshikigun, Higami, 17 June 1895, *J. Nakai s.n.* (holotype, TI!; isotype, TNS!).

Rhododendron reticulatum D. Don ex G. Don var. *parvifolium* T. Yamaz., J. Jap. Bot. 59: 209. 1984, syn. nov. *Rhododendron reticulatum* D. Don ex G. Don f. *parvifolium* (T. Yamaz.) T. Yamaz., Fl. Jap. (Iwatsuki

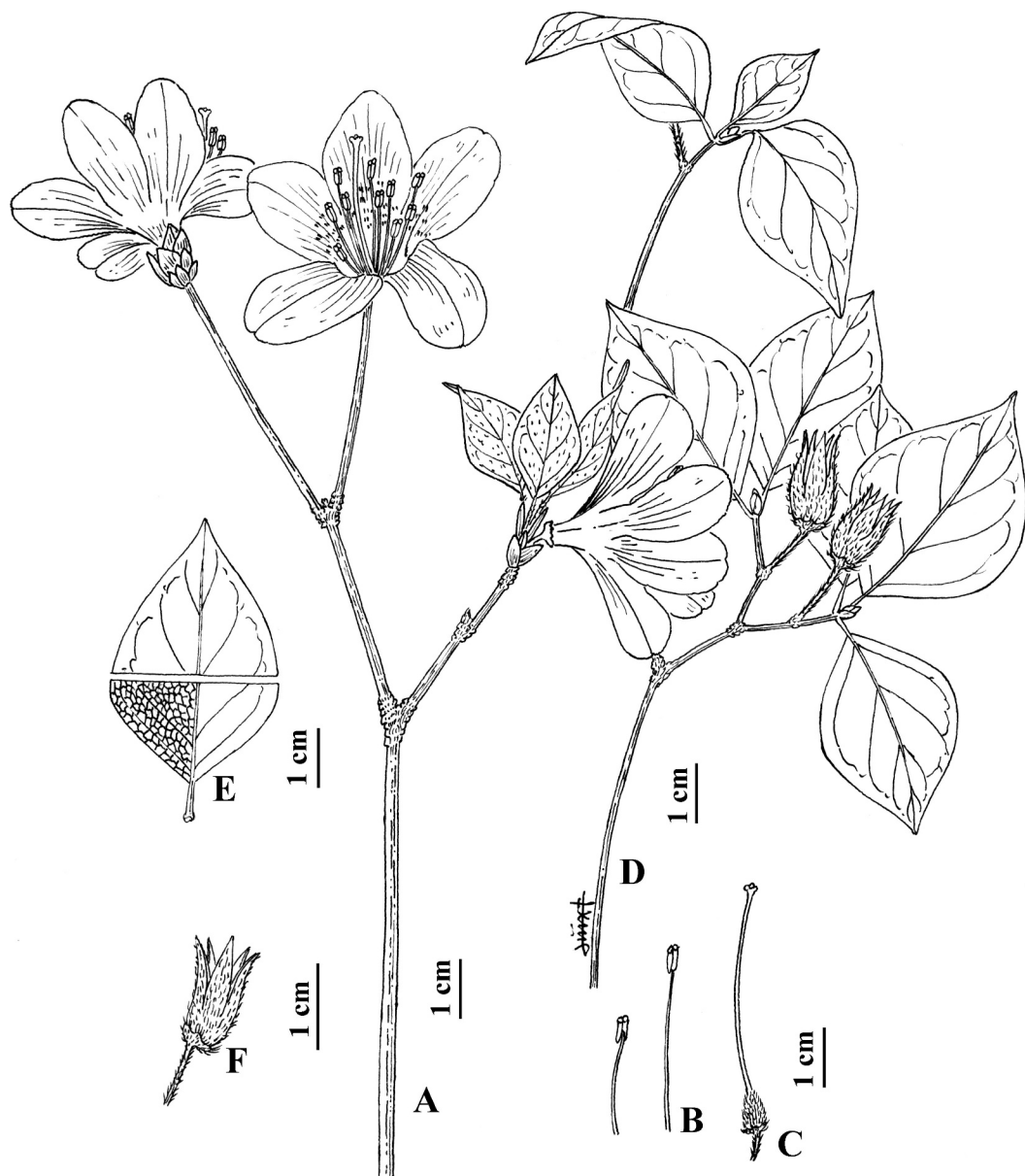


Figure 4. *Rhododendron farrerae* Tate ex Sweet. —A. Flowering shoot. —B. Stamen. —C. Style and ovary. —D. Fruiting shoot. —E. Leaf, showing indumentum. —F. Capsule. A–C from X. F. Jin 1485; D–F from W. S. Jin & B. Y. Ding 3475.

et al., eds.) (ed. 2) 3a: 37. 1993. TYPE: Japan. Shikoku: Tosa, Takaokagun, Kiyama, 21 Oct. 1942, *T. Yashinaga* s.n. (holotype, TI!).

Rhododendron reticulatum D. Don ex G. Don f. *trichostylum* M. Mizush. ex Okuhara, J. Jap. Bot. 36: 93. 1961, syn. nov. TYPE: Japan. Honshū: Pref. Nagano, Kiso, Yamaguchi, 22 Apr. 1956, *H. Okuhara* s.n. (holotype, MAK not seen, MAK photo!).

Rhododendron shimidzuianum Honda ex Makino & Nemoto, Fl. Japan., ed. 2 (Makino & Nemoto): 890. 1931, syn. nov. TYPE: Japan. Honshū: Pref. Shizuoka, Shidagun, Mt. Hanashi, 10 June 1930, *D. Shimidzu* 2 (holotype, TI!).

Rhododendron shojoense Hayata, J. Coll. Sci. Imp. Univ. Tokyo 30: 174. 1911, syn. nov. TYPE: China. Taiwan: Nantou Co., 12 Aug. 1902, *T. Kawakami* & *V. Mori* 1160 (holotype, TI!).

Rhododendron tsurugisanense (T. Yamaz.) T. Yamaz. var. *nudipetiolatum* T. Yamaz., J. Jap. Bot. 66: 125. 1991, syn. nov. TYPE: Japan. Shikoku: Pref. Ehime, 12 June 1983, *C. Abe* s.n. (holotype, TI!).

Rhododendron umbelliferum H. Lév., Repert. Spec. Nov. Regni. Veg. 12: 102. 1913, syn. nov. TYPE: China. Guizhou: Pingfa, 2 Apr. 1902, *Cavalerie* 10 (holotype, E not seen).

Shrub deciduous, 1–4 m tall; young shoots hirsute, later glabrescent. Leaves chartaceous or thin-chartaceous, usually in a whorl of 3 (3-verticillate), ovate, triangular-ovate, oblong-ovate, elliptic, or rhombic, (1.5–)2.5–7(–9) × (1–)1.5–5 cm, acute and mucronate at apex, cuneate or rounded at base, entire or sometimes minutely denticulate at margin, villose or silky pubescent on both surfaces, glabrescent or densely to sparsely villose on dorsal midrib, and reticulate on dorsal surfaces; petioles 2–10(–20) mm, glabrous or densely to sparsely villose. Inflorescences 1- or 2-flowered; pedicels 5–10(–12) mm, with brown villose indument. Calyx bowl-shaped, ca. 3 mm diam., densely pubescent, lobes inconspicuous; corolla pale purple, pink, lilac-purple, or purplish red, rarely white, rotate-funnelform, 22–35 × 30–40 mm, deeply 5-divided, tube 6–10 mm, glabrous on both surfaces, corolla lobes elliptic, oblong, oblong-lanceolate, broadly oblong, oblong-obovate, or obovate, 15–20 × 8–12 mm, upper lobes with dark purplish red spots, or without spots at base; stamens 10, rarely 8, unequal in length, 10–25 mm; filaments glabrous; anthers oblong, 1–2 mm; ovary ovoid, densely villose, style 25–35 mm, glabrous. Capsule obliquely oblong-ovoid to cylindrical, 10–15(–18) mm, 4–5 mm diam., densely to sparsely hirsute; seeds 1.1–1.8 × 0.5–0.8 mm.

Distribution and habitat. *Rhododendron farrerae* is distributed from the southern Yangtze River in China across the provinces of Anhui, Fujian, Guangdong, Guangxi, Guizhou, Hebei, Henan, Hong Kong, Hubei, Hunan, Jiangsu, Jiangxi, Shaanxi, Sichuan, Yunnan, and Zhejiang. The species is also known from southern Honshū Province in Japan. It grows in mixed forest, under forest, at forest margins, or on slopes at 50–2100 m a.s.l.

Phenology. *Rhododendron farrerae* flowers from late March to mid-May, with the flowers opening before or with the emergence of the leaves. It fruits from September to November.

Discussion. *Rhododendron farrerae* is a common species in mountainous regions adjacent to the southern Yangtze River of China. In material seen at Chinese herbaria, a group of specimens were determined as *R. mariesii*, which was noted to differ from *R. farrerae* in having longer petioles to 20 mm versus to 10 mm in *R. farrerae*, and the petioles and leaf blades being glabrate versus villose or silky pubescent in *R. farrerae* (He, 1994; He & Chamberlain, 2005). We examined one population of 70 individuals in Zhejiang, China, and these specimens demonstrate that the species vary greatly in both leaf size and indumentum from glabrate to pubescent forms. No other morphological distinctions were evident, and it is difficult to

distinguish *R. mariesii* from *R. farrerae*. Furthermore, the geographic range of *R. mariesii* is from Hebei to Guangdong and Guangxi, while that of *R. farrerae* is from Jiangxi to Guangdong and Guangxi. Because of the morphological similarities and because the geographic range of the two species overlaps in the provinces of Jiangxi, Fujian, Guangdong, and Guangxi (He, 1994; He & Chamberlain, 2005), *R. mariesii* is placed here as a synonym of *R. farrerae*.

Tam (1982: 78) described *Rhododendron daiyunicum* and indicated that this taxon differs from *R. mariesii* in having distinctive calyx lobes 5–6 mm in length and evergreen leaves. The holotype and eight isotypes deposited at FNU show that the calyx lobes are inconspicuous and that leaf persistence sometimes also occurs (e.g., Lou & Li 67, *Linou collector 82075*). He (1994) and He and Chamberlain (2005) reduced *R. daiyunicum* to the synonymy of *R. mariesii*, and herein this name shifts to the synonymy of *R. farrerae*.

In Japan, the species entity *Rhododendron farrerae* has been subdivided into multiple taxa. Miquel, Makino, Nakai, and Yamazaki described *R. reticulatum*, *R. mayebarae*, *R. nudipes*, *R. lagopus*, and other infraspecific taxa based principally on leaf shape, the indumentum of petioles and leaf surfaces, the reticulated pattern of veins on the abaxial surfaces of the leaves, and the presence of minute teeth or denticles along leaf margins. We do not find these differences to distinguish these infraspecies from *R. farrerae*.

Rhododendron farrerae var. *leucotrichum* was described, but two collections were designated as types in the protologue. Consequently, the name of this variety is not validly published according to Articles 37.1 and 37.2 of the *International Code of Botanical Nomenclature* (McNeill et al., 2006). The two syntypes were preserved at P, but we were only able to examine *P. Farges 846*. To validly publish this name, the collection *P. Farges 846*, which is in good condition, is designated as the lectotype.

Similarly, *Rhododendron mariesii* was not validly published because six collections were cited as types. Within these collections, *Wilson 29* at P is in good condition, and several of its duplicates are preserved in A, E, and W. We here designate the collection of *Wilson 29* as lectotype and the remaining collections as paratypes.

Rhododendron reticulatum was described by Don (1834: 846) as a new species, but Don indicated that this species was the plant that was native to Japan and introduced by Mr. Knight of King's Road in Chelsea. Neither a collection nor an illustration was cited as type by G. Don and D. Don in the protologue, and a lectotype must be designated in order to validly establish *R. reticulatum* and its infraspecific taxa. Don

only recognized this species with reticulated leaves, but without any flower description. The collection *F. Yamazaki s.n.*, which is preserved at TI, has reticulated leaves and a few flowers, and it is designated here as the lectotype.

Additional specimens examined. CHINA. **Anhui:** Guichi, Meijie, *Anon.* 7400 (NAS). Huangshan, Mt. Huangshan, *Huangshan Exped. 1870* (NAS), *W. H. Tsu 66* (NF), *S. S. Chien 1253* (W). Huoshan, *Majiahe For. Farm, Bot. Res. Exped. 456* (PE), *478* (PE). Qimen, s. loc., *M. B. Deng et al. 3218* (PE), *4964* (NAS). Qingyang, Mt. Jiuhuashan, *Anon.* 5518 (NAS), *A. N. Steward 1133* (N). Shexian, Shanyang, *Anon.* 1805 (PE). Shucheng, Mt. Wanfoshan, *M. B. Deng & J. Fang 11012* (PE). **Fujian:** Changting, Hetian, *S. S. You s.n.* (FJFC); Yanghou, *L. K. Li 75006* (FMP); Dafeng, *Anon.* 75009 (FMP). Chong'an, Mt. Wuyishan, *M. J. Wang 3245* (PE), *M. J. Wang et al. 3053* (NAS); Xingcun, *Wuyishan Exped. 2241* (FNU, IBSC), *2317* (FNU, IBSC); Da'anyuan, *Q. F. Zheng et al. 800089* (FJFC), *C. P. Tsien et al. 400598* (PE); Yangzhuang, *M. Suzuki et al. 98198* (PE); Tongmu, *P. S. Chiu 1421* (PE), *1565* (PE). Dehua, Chishuige, *P. C. Tsoung 95* (FNU, PE); Mt. Daiyunshan, *Anon.* 84 (N), *P. C. Tsoung s.n.* (PE). Fusheng, Mt. Damushan, *L. K. Ling 1352* (PE). Fuzhou, Mt. Gushan, *J. Y. Chen 91* (NAS); s. loc., *H. H. Chung 2250* (IBSC); Yongquansi, *J. S. Lin 83* (NF). Guangze, Siqian, *Anon.* 801143 (FNU). Hua'an, Wenhua, *W. D. Han 20209* (NF). Jiangle, Mt. Jiuxianshan, *L. K. Ling s.n.* (PE). Jianning, Mt. Raoshan, *Anon.* 614 (FJFC). Jian'ou, Dayuan, Mt. Renshan, *For. Coll. Exped. 82075* (FJFC). Liancheng, Luodi, *T. S. Wang 1123* (FNU). Longyan, Boping, *T. S. Wang s.n.* (PE). Minqing, Jiumu, *G. S. He 1717* (PE). Nanping, Maodi, *C. Hoo 2256* (FNU); Baofu, *C. Hoo 1982* (FNU); Jukou, *Anon. s.n.* (FNU), *Anon.* 9 (FMP); Shangyang, *S. S. You 533* (FJFC); Dongkeng, *S. S. You 531* (FJFC); Mt. Mangdangshan, *G. S. He 1473* (PE); s. loc., *G. S. He 9884* (PE), *1429* (PE). Pingnan, s. loc., *G. Y. Lin 889* (FNU), *909* (FNU). Shanghang, Tiejchang, *Y. Ling 4087* (FNU); Buyun, *Q. Q. Zhang s.n.* (FNU), *Q. Q. Zhang 3* (FMP); Mt. Baijieling, *Y. Ling 4135* (FNU); Guanfuban, *L. K. Ling 6856* (PE); Chucaodong, *Y. Ling 4087* (PE). Pinghe, Jiufeng, *G. S. He 115* (FNU); s. loc., *P. Lin 10163* (FJFC). Shaxian, Maixie, *P. C. Tsoung 903* (FNU, PE); Jiulidong, *P. C. Tsoung 881* (PE), *927* (PE). Shunchang, Mt. Tiantaishan, *M. S. Li & Z. Y. Li 4241* (PE); Mt. Baoshan, *M. S. Li & Z. Y. Li 6552* (PE). Yanyang, Zhangdang, *Anon.* 48 (PE). Yong'an, Luofang, *Luofang Exped. 53* (FJFC); Shangping, *Anon.* 1173 (FJFC). **Guangdong:** Boluo, Xiaojinhe River, *Y. Q. Wang 378* (IBSC), *Y. F. Deng et al. 15684* (PE); Mt. Luofushan, *N. K. Chun 40884* (PE). Conghua, Longmen, Mt. Sanjiaoshan, *W. T. Tsang 20507* (IBSC, N, NAS, P, PE); Wenquan, *S. H. Chen 18483* (IBSC). Dapu, Mt. Damaoshan, *W. T. Tsang 21214* (N, NAS, P, PE), *L. Teng 5107* (PE). Fengkai, Yulao, Mt. Qilinshan, *L. Teng 11071* (IBSC), *Anon.* 733 (CCTM). Fengshun, Datian, *X. G. Li 200996* (PE). Gaoyao, Mt. Dinghushan, *P. C. Tam 7318* (IBSC), *S. Wang 162732* (KUN, PE); Guang'an, Mt. Fengbianshan, *P. C. Tam 7332* (IBSC). Heyuan, Mt. Nanshan, *W. T. Tsang 28778* (P). Huaiji, Mt. Dachouding, *S. C. Ng 2997* (PE). Huiyang, Mt. Lianhuashan, *W. T. Tsang 25645* (IBSC); Chang'an, *Z. F. Wei 121595* (PE). Huidong, Pingshan, *P. Y. Chen & B. H. Chen 195* (IBSC). Jiaoling, Shihu, *L. Teng 4674* (IBSC). Lechang, Jiulongkeng, *N. K. Chun 42389* (IBSC); Hongliankeng, *N. K. Chun 42111* (PE); Pingshi, Banshang, *S. H. Chen 226* (IBK, IBSC). Liannan, *Anon. s.n.* (CCTM). Longnan, Mt. Wuzhishan, *S. C. Lau 4500* (IBSC). Meixian, Yingjia, Mt. Yinnashan, *W. T.*

Tsang 21412 (NAS, PE); Kuangling, Dakou, *S. Bot. Veg. 7324* (IBSC). Pingyuan, Sishui, *X. G. Li 201931* (IBSC, PE); Zouhuang, *L. Teng 4157* (IBSC); Feilaishi, *S. H. Jin & J. Xu QY-002* (HTC). Qingyuan, Mt. Xianxiadong, *S. Wang 161405* (IBSC); Feilaishi, *C. Wang 30455* (KUN, PE). Raoping, Taiping, *N. K. Chen 42602* (IBK). Ruyuan, Mt. Chixishan, *S. P. Ko 52581* (IBSC, KUN, NAS, PE); Shangshanba, *S. P. Ko 53312* (IBSC, KUN, PE, SZ). Shenzhen, Shajiaotou Forestry Farm, Mt. Wutongshan, *W. C. Ko & B. H. Chen 347* (IBSC); Nan'ao, *F. W. Xing 10360* (IBSC). Wuhua, Changbu, Mt. Qimuzhang, *X. G. Li 201579* (IBSC, PE). Xinfeng, Mt. Yuechengshan, *W. T. Tsang 508* (P). Yingde, Mt. Hua-shuishan, *P. H. Liang 84208* (IBSC). **Guangxi:** Binyang, Silong, *Binyang Exped. 2-411* (GXMI). Bobai, Santan, *S. Q. Zhong 463463* (IBSC). Guchun, Mt. Yaoshan, *Anon.* 23758 (IBSC), *404* (IBSC). Guilin, Mt. Yanshan, *Sino-Gem. Exped. 155* (IBSC), *S. L. Huang 20006* (IBK), *S. Q. Zhong 104* (IBK). Guiping, s. loc., *N. K. Liang 10873* (GXMI). Hexian, Xishan, *L. X. Chen 500044* (IBSC, LBG), *S. Q. Yu et al. 500044* (IBK). Huanjiang, Dongxing, *Peking Exped. 894038* (PE); Jiuren, *Peking Exped. 895118* (PE). Jinxiu, Liugang, Mt. Shengtangshan, *Dayaoshan Exped. 12440* (IBSC), *B. Y. Ding & Y. P. Chen 7617* (HTC); Mt. Lianhuashan, *G. Z. Li 14469* (PE); Mt. Laoshan, *G. Z. Li 14502* (PE); s. loc., *J. Y. Luo & Z. H. Pan 512-67* (GXMI). Lingui, Chaotian, *C. F. Liang 30241* (IBK), *L. Q. Chen 94593* (IBK); Mt. Qifenshan, *Anon.* 53796 (IBK), *C. F. Liang 31364* (IBK); Wantian, *C. F. Liang 31615* (IBK). Longsheng, Dadi, Mt. Hongyashan, *Guangfu For. Exped. 147* (IBK, IBSC, PE, SZ), *204* (IBK, PE, SZ); Huaping, *Anon.* 272 (PE). Luocheng, Mt. Miushan, *R. C. Ching 6088* (PE). Nandan, Yueli, Hualiang, *K. C. Mo 8* (GXMI). Pingnan, Mt. Yaoshan, *C. Wang 39297* (IBK, IBSC), *39153* (IBK). Quanzhan, Shanchuan, *C. H. Tsoung 82036* (IBK, IBSC); Mt. Baodingshan, *C. H. Tsoung 81621* (IBK). Rong'an, Daji, Mt. Baizhushan, *G. R. Long 850044* (IBSC). Rongshui, Mt. Damiaoshan, Mt. Jiuwanshan, *S. H. Chen 16418* (IBK, KUN, PE); Mt. Jiuwanshan, *Peking Exped. 892482* (PE). Shanglin, Mt. Damingshan, *S. F. Yuan 6508* (CDBI, SZ), *C. S. Tsia 5397* (IBK); Shanglin Forestry Farm, *S. F. Yuan 6508* (IBK). Wuming, Mt. Damingshan, *C. S. Tsai 5397* (IBSC), *D. Fang & D. H. Qin 24526* (GXMI); Matou, *G. G. Xie et al. 2-59* (GXMI). Xing'an, Mt. Mao'ershan, *C. H. Tsoung 808624* (IBSC), *G. Z. Li 16776* (PE); Tangdong, Leigongtian, *Z. Z. Chen 51407* (IBSC, KUN, PE), *Guangxi Exped. 690* (PE). Yangshuo, Yuanda, Mt. Changyushan, *H. F. Qin 700171* (IBK). Zijin, Jiushu, *Z. F. Wei 120934* (IBSC, KUN, PE). Ziyuan, Leigongtian, *C. H. Tsoung 83441* (IBSC). **Guizhou:** Huangping, Pingxi, *R. G. Li 1562* (GZTM). Jiukou, Macaohu River, *Z. S. Zhang 400359* (HGAS, IBSC), *400454* (HGAS); Mt. Fanjingshan, *Wulingshan Exped. 796* (KUN, PE). Kaili, Mt. Leishan, *S. Guizhou Exped. 1525* (NAS, PE), *3893* (PE); Wudong, *S. Guizhou Exped. 1042* (HGAS, NAS), *N. Guizhou Exped. 879* (HGAS, KUN, PE); Fangxiang, *C. P. Tsien et al. 51101* (KUN). Pingfa, Mt. Yunwushan, *D. X. Ji 443* (GZTM). Qingzhen, Mupanzi, Dashan, *Sichuan-Guizhou Exped. 2210* (PE). Shibing, Maxi, Mt. Jiulongshan, *Wulingshan Exped. 2565* (KUN, PE). Shiqian, Jiuchashu, *Wulingshan Exped. 2779* (KUN, PE). Songtao, Tianmasi Forestry Farm, *Wulingshan Exped. 51* (KUN, PE); Muerxi, *N. Guizhou Exped. 1839* (HGAS, IBK, KUN, PE). Tongren, Yangtuo, Jiulongdong, *Wulingshan Exped. 1570* (KUN, PE). Wen'an, Daoping, *Libo Exped. 2019* (HGAS, KUN, PE). Xiashun, s. loc., *Z. X. Zhao 386* (NF). Yinjiang, Mt. Fanjingshan, *Anon.* 46 (NAS), *N. Guizhou Exped. 90* (HGAS), *B. Bartholomew et al. 1723* (PE); Xiajiahe, *S. Guizhou Exped. 31805* (HGAS); Niuiweihe, *N. Guizhou Exped. 32210* (HGAS); s. loc., *N. Guizhou Exped.*

- 401496 (HGAS). **Hebei:** Changping, Chengyucheng, P. C. Tsong s.n. (PE). Lingnan, Heloudou, W. T. Wang 2065 (PE), Liuliping, Anon. 2027 (IBSC). **Henan:** Lushi, Wulichuan, Minglanghe River, Anon. 34158 (PE). Songxian, Shifang, *Henan Exped. 2191* (NAS, PE); Xiqi, Xiaman, *Henan For. Bureau 969* (PE); Miaozhi, *Henan Exped. 1834* (PE). Yichuan, s. loc., *Bot. Exped. 20201* (PE). **Hong Kong:** Mt. Ma'onshan, S. Y. Hu 5122 (IBSC), 6378 (PE); Victoria Peak, S. Y. Hu 11603 (IBSC); Jiutiaokeng, N. K. Chun 42600 (IBK); s. loc., C. Wright 196 (P), 483 (P); Tungchung, Lantau Island, S. Y. Hu 6654 (PE). **Hubei:** Badong, Xiagu, *Hubei Bot. Exped. 24600* (PE); Siyangqiao, H. C. Zhou 622 (N); s. loc., H. C. Chou 108 (PE), 622 (PE). Changyang, Leguo, Q. F. Yao 10 (PE). Chuchin, Zizhuyuan, K. M. Liou 8777 (PE). Fangxian, Panshui, Anon. G. F. Zhu (IBSC, LBG); Songbai, H. J. Li 443 (LBG, PE). Hefeng, Daping, H. J. Li 4596 (PE), 6209 (KUN, PE, SZ); Huping, H. J. Li 5519 (PE, SZ); Yanziping, F. S. Peng He-833 (PE), R. H. Huang 790 (PE); s. loc., Y. M. Wang 6203 (PE). Jianshi, Huaguoping, W. B. Lin 83 (PE). Jinxian, Mt. Wudangshan, J. Q. Xing 12548 (SZ). Lichuan, Shuishanba, T. C. Hua 377 (NF), W. C. Cheng & T. C. Hua 897 (NF); Maoba, W. C. Cheng & T. C. Hua 1027 (NF); Mt. Xingdoushan, G. G. Tang & X. H. Song 239 (IBK, NF); Xiaohe, Mt. Yaojialaoshan, L. Y. Dai & C. H. Qian 1037 (PE), 1453 (PE); Jianzhuxi, W. B. Lin 361 (PE). Wanxian, Modaoxi, T. C. Hua 275 (PE). Xingshan, s. loc., C. M. Hu 1014 (LBG); Mt. Tianzhushan, Y. Chen 850 (N). Xuan'en, Maotang, Anon. 2479 (PE). Shennongjia, 263-*Exped. 2323* (PE), B. Bartholomew et al. 787 (PE). **Hunan:** Cili, Xingming, X. G. Li 203904 (IBSC); Yujiuzui, X. G. Li 203966 (IBSC); Suoxigu, W. Hunan *Exped. 42* (PE). Datang, Zhushituo Forestry Farm, T. R. Cao 84385 (NF). Dayong, Zhangjiajie, *Central-South For. Coll. Exped. 31021* (IBSC); Zhangjiajie Forestry Farm, L. H. Liu 762173 (HNNU). Dongkou, Nakou, P. C. Tam 62806 (HNNU, IBSC), 62812 (IBSC). Guidong, Xiaowuxi, T. R. Cao 82435 (NF). Hengyang, Nanyue, Z. D. Chen 46 (IBSC). Jianguyong, Limu'ao, P. C. Tam 62329 (IBSC). Longshan, Wuya, L. H. Liu 1814 (PE); Wuya, B. M. Yang 2125 (HNNU). Nanyue, Cangjingdian, Y. Liu 338 (NAS, PE). Ningyuan, Mt. Yangmingshan, P. C. Tam 63643 (IBK). Pingjiang, Mt. Mufushan, J. Xiong 6291 (LBG). Qidong, Lingguan, M. H. Li 1386 (IBSC). Sangzhi, Chenxuehe River, X. G. Li 204345 (IBSC); Baxi, Mt. Tianpingshan, B. G. Li & S. B. Wan 750145 (HNNU, IBSC, PE). Shimen, Mt. Hupingshan, *Hupingshan Exped. 87157* (PE); Xiaoxi, *Hupingshan Exped. 1286* (PE), 87376 (PE); Jiangping, *Hupingshan Exped. 181* (PE). Wugang, Wuli'an, *Veg. Exped. 1037* (HNNU). Xinning, s. loc., C. C. Luo 1289 (P); Mt. Ziyunshan, *Ziyunshan Exped. 267* (PE); Yaoshi, L. P. Luo 622 (PE); Shunhuangshan Forestry Farm, S. B. Wan 762580 (HNNU). Yizhang, Mt. Mangshan, P. H. Liang 83479 (IBSC), M. X. Huang 112740 (HNNU, IBSC); Mt. Pingtoushan, W. T. Tsang 23468 (W); Meitian, P. C. Tsong 656 (PE); Mt. Genshan, Z. C. Luo 1289 (PE); Wanfeng Forestry Farm, Z. C. Luo 1368 (PE). Yongshun, Shanshuihe Forestry Farm, *Hunan Exped. 290* (IBSC); Xiaoxi Natural Reserve, *Peking Exped. 292* (PE); Shanmuhe, *Veg. Exped. 490* (HNNU). Zhijiang, Dashu'ao, *Wulingshan Exped. 2184* (IBSC, PE); Muyexi, *Wulingshan Exped. 1779* (IBSC, PE). Zixing, s. loc., P. H. Liang 85921 (IBSC). **Jiangsu:** Dangtu, Mt. Gaolishan, Anon. 72501677 (NAS). Danyang, s. loc., *Nanjing For. Exped. 7250-29* (IBSC). Gaoyou, s. loc., H. Y. Long 2800-332 (IBSC). Jiangning, Henghua, *Nanjing For. Exped. 6237* (IBSC). Jurong, Mt. Baohuashan, J. J. Gong 656 (NAS), C. Y. Chiao 2044 (N); Mt. Kongqingshan, F. Gao 124 (NF). Nanjing, Mt. Zijingshan, G. N. Chen 8742 (W), S. X. Yang et al. 411 (PE); Mt. Qixiashan, *Herbarium 160* (IBK, LBG, NAS), C. Y. Chiao 2092 (N, PE). Suzhou, Mt. Taipingshan, Anon. 3576 (NAS), H. B. Zhou 2082 (IBSC, PE); Mt. Shangfangshan, H. Migo s.n. (PE). Wuxi, Mt. Yunzhangshan, H. B. Zhou 2541 (PE). Wuxian, Guangfu, W. Z. Fang et al. 117 (NAS, PE), S. X. Sun & P. P. Ling 14 (KUN). Xishan, Mt. Baoshan, W. X. Wu 4031 (IBSC). Yixing, Mt. Panshan, F. X. Liu 1905 (NAS); Mt. Longchishan, S. H. Mao et al. 122 (KUN, LBG, NAS, PE), Y. L. Keng 2372 (IBSC); Zhangzhu, C. Y. Luh 361 (NAS); Huhou, Mt. Shizishan, S. H. Mao et al. 266 (KUN, LBG, PE, SZ). Zhenghong, Mt. Pingchenshan, Anon. 2310 (NAS). **Jiangxi:** Anfu, Mt. Wugongshan, J. S. Yue 3417 (IBSC, KUN, PE). Anyuan, Dujiang, C. M. Hu 2564 (IBK, IBSC, KUN, LBG), 2769 (IBSC, KUN, LBG, PE); Shuangmao, S. S. Lai et al. 165 (LBG); Mt. Sanbaishan, L. X. Ding 21 (IBSC); Banshi, Ge'ao, C. M. Hu 2141 (LBG, PE). Dexing, Mt. Daomaoshan, *Nanjing For. Exped. 112* (NF), M. X. Nie 5950 (PE); Longshou, S. S. Lai et al. 348 (LBG). Fenyi, Mt. Dagangshan, S. S. Lai 43 (PE). Guangfeng, Dafeng, M. X. Nie & S. S. Lai 5950 (IBSC, KUN, LBG). Ganxian, Huangpodi, Z. B. Yang & K. Yao 1125 (IBSC, PE); Xiaocha, Z. R. Yu 1566 (IBSC). Guixi, Mt. Xiaolangang, Shen & Huang 284 (LBG). Jiujiang, Mt. Lushan, M. J. Wang 150 (NAS), H. H. Hu 2392 (IBSC). Laicheng, Mt. Daluoshan, Y. Tsiang 10351 (IBSC). Longnan, Tuntou, Mt. Jiulianshan, Anon. 1358 (LBG). Nanfeng, Jiafeng, Mt. Jiafengshan, M. X. Nie 2483 (KUN, LBG); Changbi Farm Center, X. X. Yang et al. 650128 (PE); Sanxi, X. X. Yang et al. 650454 (PE). Pingxiang, Gaoshan, *Jiangxi Exped. 2989* (IBSC), Mt. Wugongshan, X. M. Gao 1523 (NF), C. D. Chu & C. S. Chao 1240 (NF); Changle, Gaoyuan, *Jiangxi Exped. 2989* (PE). Qianshan, Mt. Wuyishan, C. P. Tsiang 400996 (FNU, PE), C. P. Tsiang et al. 400787 (PE); Mt. Huanggangshan, X. Q. Huang 235 (NF), R. M. Hao 890148 (NF); Shilong, C. P. Tsiang et al. 401218 (PE). Ruijin, s. loc., C. M. Hu 3635 (LBG, PE). Shangrao, Mt. Huaiyushan, Anon. 600 (LBG); Mt. Wufushan, M. X. Nie & S. S. Lai 4896 (IBSC, KUN, PE). Shangyou, Mt. Wuzhishan, *Jiangxi Exped. 915* (PE). Shicheng, Huifang, C. M. Hu 4878 (IBSC, KUN, LBG, PE). Suichuan, Mt. Jinggongshan, J. S. Yue et al. 5098 (NAS), J. Xiong 2389 (LBG). Tonggu, Mt. Daweishan, J. Xiong 4769 (LBG), 5106 (LBG). Wuning, Shimenlou, Y. G. Xiong 4138 (LBG); Yishan, S. S. Lai 2481 (PE). Wuyuan, Mt. Wugongshan, X. X. Yang 17381 (IBSC). Xinjian, Jinpan Forestry Farm, M. X. Nie 2026 (KUN, LBG); Mt. Mengshan, X. X. Yang 10302 (PE); Liushulong, Y. Lin 13451 (PE), 13452 (PE). Xiushui, Mt. Huangquanshan, J. Xiong 5982 (LBG); Baishaqiao, Y. G. Xiong 5500 (LBG, PE). Xunwu, Luotang, Y. Lin 15038 (LBG); Dingshan, C. M. Tan 9605020 (B), *Student Exped. 1119* (IBSC, PE), 1203 (PE); Cheju, Danxi, Y. Lin 15287 (PE). Yongxin, Lianshan Farm Center, S. S. Lai 969 (LBG, PE); Yunshan Farm Center, S. S. Lai 2024 (PE). Zixi, Mt. Matoushan, S. S. Lai & D. F. Huang 14 (LBG); Niuyuan, M. J. Wang 2452 (IBSC, PE). **Shaanxi:** Chenggu, Panlong, Xinglong, S. M. Su 419 (PE). Foping, N. Huayang, P. C. Kuo 1810 (IBSC, PE); Huangbaiyuan, K. T. Fu 4920 (IBSC, KUN, PE); Shangnan River, P. C. Kuo 4300 (IBK, IBSC); Shanshuping, T. N. Liou & P. C. Tsong 3374 (PE). Shanyang, Yugang, J. X. Yang & Y. M. Liang 2880 (PE). Xunyang, Pingding, M. C. Wang 220 (SZ). Yangxian, Banqiao, *Qinling Exped. 10948* (PE); Tianbazi, *Qinling Exped. 985* (PE); from Duangongba to Huayang, T. N. Liou & P. C. Tsong 3489 (PE); Mt. Taibashan, C. S. Niu 3105 (SZ). Near Ningqiang, T. N. Liou 11869 (PE). Pingli, Mt. Dafuyaoshan, P. Y. Li 1343 (PE). Zhenba, Changling, J. A. Wang 94 (CDBI). Zhenping, near Niutoudian, P. Y. Li 1343 (NAS); Mt. Xishan, Q. H. He 1263 (SZ). **Sichuan:** Chengkou, Houping, T. L. Dai 105783 (CDBI, KUN, NAS, PE, SZ), W.

- P. Fang 10083* (SZ); Yanmai, *T. L. Dai 106775* (NAS); Yiziba, Baimuping, *T. L. Dai 103986* (IBSC, NAS, PE, SZ); Chengshan, Mt. Qiganshan, *T. L. Dai 103753* (IBSC, NAS); Mt. Baichishan, *T. L. Dai 102855* (IBSC); Yanmaiba, *Taiyishan Exped. 610* (CDBI); Beiping, *T. L. Dai 101574* (CDBI); s. loc., *W. P. Fang 10083* (IBSC, PE), *T. L. Dai 105449* (CDBI, SCFI). Fengjie, Longchi, *H. F. Zhou & H. Y. Su 11824* (IBSC), *109471* (IBSC, SZ); Jiannong, *C. Y. Chang 25632* (IBSC, NAS, PE, SZ), *H. F. Zhou & H. Y. Su 110734* (IBSC, PE); Zhuyuanzi, *M. Y. Fang 23929* (IBSC, KUN, PE); Gaoyan, *H. F. Zhou 26608* (IBSC); Hanrui, *M. Y. Fang 24511* (IBSC, KUN); Gaozhi, *H. F. Zhou 26608* (SZ); Xinhe, *C. Y. Chang 26023* (SZ). Fuling, Baitao, Yongsheng Forestry Farm, *F. D. Pu & Y. L. Cao 1281* (PE). Hejiang, Fubao forestry farm, *Q. G. Tian et al. s.n.* (SCFI). Kaixian, Baiquan, *T. L. Dai 100001* (PE). Nanchuan, Daheba, *G. F. Li 61180* (IBSC, KUN, NAS), *J. H. Xiong & Z. L. Zhou 93025* (IBSC, KUN, PE); Baiwuping, *G. F. Li 60480* (N, SZ), *60475* (KUN, PE); Xiaohakanba, *J. H. Xiong & Z. L. Zhou 91982* (IBSC, SZ), *93830* (IBSC, PE, SZ); Toudi, *K. C. Kuan et al. 300* (PE); Delong, *Jinfoshan Exped. 223* (PE); Mt. Jinfoshan, *G. F. Li 63681* (IBSC, KUN, SZ), *K. C. Kuan et al. 140* (PE). Shizhu, Nanmu, *F. D. Pu & Y. L. Cao 899* (CDBI, PE); Huangshui, *F. D. Pu & Y. L. Cao 1141* (CDBI, PE); Yuchi, *R. Chen 75* (CDBI, SZ). Wulong, Baima Forestry Farm, *F. D. Pu & Y. L. Cao 303* (CDBI, PE). Wushan, Zhuxian, *G. H. Yang 57888* (IBSC, PE, SZ), *59910* (CDBI, PE, SZ); Luoping, *G. H. Yang 65530* (CDBI, IBSC, KUN, PE). Wuxi, Hekou, *P. Y. Li 2994* (NAS); Baiguo, *G. H. Yang 58314* (IBSC, PE, SZ), *D. P. He 57764* (SZ); Yuanfeng, *K. L. Chü 1955* (PE). **Taiwan:** Taihoku, Bunzan, *Suzuki & Tokio ST16608* (PE), *ST18164* (PE); Datong, *T. Y. Liu 924* (IBSC); Nanzhuang, Luchang, *C. H. Chen et al. 628* (IBSC). **Yunnan:** Lijiang, Chaotuo, *T. T. Yü 5079* (PE); Mt. Yulongshan, *Anon. 100401* (LBG). **Zhejiang:** Anji, Mt. Longwangshan, *S. X. Huang 8534-083* (ZJFC). Chun'an, Wangfu, *Zhejiang Bot. Exped. 30263* (PE), *P. L. Chiu 859* (HHBG). Deqing, Mt. Moganshan, *Cheo & W. F. Wilson 95* (N), *Y. Chen 5987* (NF). Hangzhou, s. loc., *S. Y. Chang 2362* (HHBG, PE), *X. F. Jin s.n.* (HTC). Jiande, Jiande Forestry Farm, *M. C. Liu 770025* (ZJFC); Shouchang, Lühetang, *M. L. Sheh et al. 27105* (HHBG, NAS); Fengshuwan, *Anon. 29607* (NF). Jingning, Baihe, *S. Y. Chang et al. 24543* (NAS), *Anon. 24541* (HHBG). Jinyun, Mt. Dayangshan, *C. S. Ding & L. H. Lou 313* (ZJFC), *W. J. Jin & B. Y. Ding 3475* (HZU). Kaihua, Mt. Gutianshan, *G. Y. Li 359* (ZJFC); s. loc., *G. R. Chen 2487* (KUN). Lin'an, Changhua, *X. F. Jin s.n.* (HTC), *Y. Y. Ho 29939* (IBSC, NAS); Mt. Longtangshan, *Anon. 115* (HHBG), *T. Hong & C. P. Shang 93* (NF); Mt. Tianmushan, *Y. W. Law 1125* (N), *M. Chen 765* (IBSC, PE). Longquan, Mengkeng, *S. Y. Chang et al. 23013* (NAS); Mt. Maoshan, *R. H. Shan 5532* (PE), *S. Y. Chang 2875* (PE), *4459* (KUN); Mt. Fengyangshan, *C. S. Ding 5218* (ZJFC), *C. F. Zhang et al. 716* (HZU). Pan'an, Mt. Dapanshan, *L. Hong 2312* (HHBG). Pingyang, Juxi, *R. H. Shan 6193* (NAS); Mt. S. Yangdangshan, *Anon. D12* (PE). Pujiang, Liuluo, *Q. H. Zhang 3161* (ZJFC), *L. G. Huang 2229* (ZJFC). Rui'an, Shuanghong Forestry Farm, *Anon. 725* (ZJFC), *S. Y. Chang 6513* (HHBG). Shangyu, Chenxi, *Shangyu For. Ins. 0275* (ZJFC). Songyang, Fengping, *L. H. Lou et al. sy043* (ZJFC). Suichang, Dabei, *M. L. Sheh et al. 555* (NAS); Dazhe, *Zhejiang Bot. Exped. 25552* (HHBG, PE); Mt. Baimashan, *S. Chen 1197* (SZ); Mt. Jiulongshan, *Q. B. Cheng 3046* (ZM), *F. G. Zhang & M. H. Wu 4353* (ZM). Taishun, s. loc., *S. Y. Chang 2875* (IBSC); Siqian, *S. Y. Chang 3582* (IBSC, PE); Mt. Wuyanling, *S. Y. Chang 5617* (HHBG, KUN, PE), *G. Y. Li et al. 579* (ZM); Yangxi, *S. L. Zhou 277* (ZJFC), *Z. G. Mao 10262* (HHBG). Tiantai, Mt. Huadingshan, *Zhejiang Bot. Exped. 27935* (NAS, PE), *X. F. Jin 1473* (HTC); Mt. Tiantaishan, *L. Q. Qiu & R. L. Lu 1938*, *2066* (IBK); s. loc., *G. R. Chen 2375* (KUN), *G. L. Que 27935* (ZM), *Tonglu, s. loc., Anon. 150* (HHBG). Wencheng, Shiyang, *P. J. Feng 133* (HHBG), *Zhejiang Med. Bot. Exped. 1755* (ZM), *Wuyi, Xilian, Mt. Niutoushan, C. S. Ding & G. Y. Li W046* (ZJFC), *L. L. Zhou et al. J8322-021* (ZJFC). Xianju, s. loc., *Anon. 45001* (ZJFC), *Anon. 7816* (HHBG). Yongjia, s. loc., *Agric. Exped. 939* (PE); Xixian, *Yongjia For. Ins. 1285* (ZJFC); Mt. Sihaishan, *S. L. Zhou 292* (ZJFC). Yuhang, Jingshanshi, *S. Chen 2480* (ZJFC), *Y. L. Keng 531* (N, SZ). Yunhe, Sanfengyan, *S. Chen 2756* (SZ); Jinhua, Andi, *S. Chen 983* (SZ), *Zhuji, Shisidou, S. Chen 48* (N); Wuxie, Mt. Zhanglangshan, *C. S. Ding s.n.* (ZJFC), *F. M. Guo et al. 177* (ZJFC). JAPAN. **Honshu:** Pref. Aichi: Nagoya, *S. Okuyama 21344* (TNS). Pref. Chiba, Pref. Awa-gun: Mt. Kiyosumi, *H. Ohashi & Y. Tateishi s.n.* (PE). Pref. Gifu: Nakatsugawa-shi, *S. Tsugaru et al. 27703* (KYO); Yoro-gun, Yoro-cho, *H. Takahashi et al. 7013* (KYO); Mt. Takayama, *M. Honda s.n.* (TI); Oniwa, *H. Funakoshi 641* (TI); s. loc., *N. Kurosaki 12537* (TI). Pref. Hiroshima: Yamagata-gun, Kake-cho, *N. Kurosaki 15525* (KYO); Sandankyo, *H. Hara s.n.* (TI). Pref. Mie: Isshi, Yahatamura, *H. Kana s.n.* (TI); Isshi-gun, Taroumura, *H. Kanai s.n.* (TI); Hirakura, *G. Murata & N. Fukuoka 213* (TI); Sima-gun, Ago-cho, *S. Noshiro et al. 939* (TI). Pref. Hyogo: Akou-gun, Kamigouri-cho, *N. Fukuoka 13893* (TNS); Miki-shi, Toda, Shizimi-cho, *G. Murata & H. Nishimura 657* (TI, TNS), *663* (TI); Ibo-gun, Shingu-cho, *H. Kato 960020* (KYO); Kobe-city, Kita-ku, Mt. Chigogabakayama, *N. Fukuoka 12901* (KYO); Sayoo-gun, Mt. Funakoshiyama, *J. Murata 9576A* (TI); Shiso-gun, Senju-machi, *J. Murata 10945* (TI); Isl. Awaji-shima, *T. Tuyama 5685* (TI). Pref. Kyoto: Amada-gun, Yakuno-cho, *H. Takahashi 1173* (TNS); Maidzuru-shi, Mt. Kunimiyama, *S. Tsugaru & T. Takahashi 24716* (KYO), *24357* (KYO); Kameoka-shi, Hodzu-cho, Mt. Ushimatsuyama, *S. Tsugaru et al. 265* (KYO); Kameoka-shi, Sogabe-cho, *S. Tsugaru et al. 299* (KYO); Kumano-gun, Kumihama-cho, *S. Tsugaru et al. 21372* (KYO); Kasa-gun, Ooe-cho, Bussoji, *S. Tsugaru et al. 21958* (KYO); Kyoto-shi, Takaraga-ike, *Z. Sato s.n.* (TI); Kitakuwata-gun, Miyamachi, *Y. Tateishi & J. Murata 4156* (TI); Sakyo-ku, Ichijyoji, Hayama-cho, *M. Togashi s.n.* (TI); Ukyoku, Oharano, *G. Murata 15013* (TI); Kurobe, Yasaka-cho, *G. Murata 20158* (TI); Kyoto City, Sakyo-ku, *N. Naruhashi & M. Wakabayashi 1358* (P). Pref. Nagan: Shimoina-gun, Mt. Hontakamori, *T. Yamazaki & K. Asano 7562* (KYO); Shimona-gun, Hiraomura, *S. Hojo 13563* (TI). Pref. Nara: Tenri-shi, Hukusumi-cho, *N. Morimoto 3903* (KYO); Nara-shi, Ninnikusan, *M. Ito & E. Kinoshita 64* (KYO); Yoshino-gun, Kamikitayama-mura, *M. Ito 598* (KYO); Yoshino-gun, Tenkawa-mura, *H. Koyama 1845* (P); Mt. Oomine, *K. Takada 79201* (TI); Gose-shi, Mt. Katsuragi, *H. Ohashi et al. 607* (TI), *606* (TI). Pref. Okayama: Sooga-shi, Minagi, *J. Murata 9526* (IBSC, KYO, SZ, TI); Maniwa-gun, *Kariyama Shungo 12968* (TI), *12966* (TI), *12964* (TI); Aida-gun, *Kariyama Shungo 13557* (TI); Tomata-gun, *Kariyama Shungo 13309* (TI); Sengenkeikoku, Okutsu-cho, *Kariyama Shungo 12969* (TI), *12963* (TI); Wake-gun, Hinase-cho, *T. Yamazaki 5666* (TI); Atetsu-gun, Kodzirok-mura, *M. Togashi 9948* (P). Pref. Osaka: Kitakawachi-gun, Tsuda-mura, *M. Hiroe 16233* (KYO); Takatsuki-shi, *N. Naruhashi & F. Konta 43* (P). Pref. Shiga: Ohtsu-shi, Mts. Hira, *T. Yahara et al. 108* (KYO); Ika-gun, Yogo-machi, *Y. Tateishi & T. Nemoto 12188* (TI). Pref. Shimane: Kanoashi-gun, Nichihara-cho, *N. Kurosaki 9115* (KYO); Hamada-shi, *T. Fukuura 7080* (KYO); Hikawa, Mt. Hanatakayama, *H. Hara s.n.* (TI). Pref. Shizuoka: Mt. Higane, *H. Hara 4035* (PE); Mt. Amagi, *T.*

Yamazaki 9502 (PE); Syuchi-gun Haruno-cho, Mt. Watake, *G. Murata et al. 112* (P). Pref. Tottori: Misasa-machi, Mt. Mitoku, *M. Togashi 10227* (KYO); Saihaku, Daisen-machi, *K. Midorikawa 2246* (TI), *M. Togashi s.n.* (TI); Mt. Daisen, *N. Satomi 318* (TI), *T. Sano s.n.* (TI), *H. Idzumi & M. Togashi s.n.* (TI), *N. Kurosaki 14493* (TI); Kooga, Mt. Handosan, *J. Murata 10926* (TI). Pref. Toyama: Mt. Tateyama, *T. Yamazaki 1811* (TI). Pref. Wakayama: Mt. Nachi, *H. Hara s.n.* (TI); Ito-gun, Koya-cho, *T. Makino 82305* (TI). Pref. Yamaguchi: Yanai-shi, *F. Tatsundo 5292* (KYO); Nagatoshi, Isl. Ohmi, *S. Saito 640* (B); Iwakuni-shi, *T. Koponen 1683* (W). Pref. Yamanashi: Kohu-shi, Mt. Kitayama, *H. Uematsu 524* (TI). **Kyūshū:** Pref. Fukuoka: Buzen-city, Mt. Inugatake, *T. Yahara et al. 5513* (KYO); Mt. Homan, *S. Saito s.n.* (TI). Pref. Kagoshima: Isl. Yakushima, *T. Tashiro s.n.* (KYO), *H. Ikeda & T. Yahara 254* (KUN); Ohsumi-hanto, Indodake, *K. Maruno 6398* (TI); Mt. Shibisan, *K. Maruno 19915* (TI), *19916* (TI). Pref. Kumamoto: Higo, Mt. Ichifusa, *K. Takada 24113* (TI), *K. Mayebara 2419* (TI), *2418* (TI), *S. Yamaguchi 6888* (TI). Pref. Miyazaki: Higashiusuki-gun, Mt. Tsunodake, *G. Murata 67881* (KYO); Higashiusuki-gun, Mt. Shiraiwa, *T. Shimizu 3475* (KYO), *X. F. Jin 1437* (HZU); Nishiusuki-gun, Iwato-mura, Mt. Katamukiyama, *N. Fukuoka 7204* (KYO); Mt. Ooku, *K. Takada s.n.* (TI); Higashi-gun, Kitagawamachi, *K. Inoue 1109* (TI), *1129* (TI); Mt. Wanitsukayama, *H. Idzumi & M. Togashi s.n.* (TI), *S. Yamaguchi 6892* (TI); Nishimorokata-gun, *K. Takada 23592* (TI); Nishi-gun, Iwato-mura, *K. Takada 22356* (TI). Pref. Nagasaki: Shimoagata-gun, Mitoshima-cho, Mt. Shirodake, *M. Hotta s.n.* (KYO); Shimoagata-gun, Izuhara-cho, Isl. Tsushima, *E. Mii 847* (KYO); Shimoagata-gun, Isl. Tsushima, *H. Ohashi & H. Ohba 299* (KYO); Mt. Inasayama, *S. Saito s.n.* (TI). Pref. Niigata: Minamikanbara, *Takasi & F. Yamazaki 9400* (TI); Kitawonuma-gun, *H. Kanai s.n.* (TI); Nishikanbara-gun, Yahikomura, Yahiko-yama, *T. Yamazaki 3167* (KUN). Pref. Oita: Shimoke-gun, Yamaguni-cho, Mt. Hikosan, *G. Murata 45530* (KYO); Yufu-dake, Himnka-yama, *F. Yamazaki 5223* (KUN). **Shikoku:** Pref. Ehime: Uma-gun, Mt. Nishiakaishiyama, *M. Hotta 10778* (KYO); Saijo-city, Mt. Ishizuchi, *N. Kurosaki 4876* (KYO), *H. Hara s.n.* (TI); Kitauwa-gun, Yoshido-machi, *J. Murata 15046* (IBSC), *15047* (KUN). Pref. Kagawa: Kankakei, *H. Idzumi & M. Togashi s.n.* (TI). Pref. Kochi: Kami-gun, Monobe-mura, Mt. Ishitate, *N. Kurosaki 7397* (KYO); Tomiokamura, Mt. Tsutsujosan, *G. Murata & T. Shimizu 848* (KYO); Mt. Rokko, *T. Makino 82304* (TI); Hidakamura, Imose-toge, *Z. Sato s.n.* (TI). Pref. Tokushima: Naruto-city, *H. Koyama & G. Murata 4183* (TNS).

5. *Rhododendron quinquefolium* Bisset & S. Moore, J. Bot. 15: 292. 1877. *Azalea quinquefolia* (Bisset & S. Moore) Olmsted, Coville & Kelsey, Stand. Pl. Names: 27. 1923. TYPE: Japan. Honshū: Nikko, 23 May 1876, *J. Bisset 233* (lectotype, designated by Judd & Kron, 1995: 16, E not seen). Figure 5.

Rhododendron quinquefolium Bisset & S. Moore f. *speciosum* N. Yonez., J. Phytogeogr. Taxon. 35: 101. 1987. TYPE: Japan. Honshū: Pref. Shiga, Mt. Hira, 24 May 1987, *N. Yonezawa s.n.* (holotype, KANA not seen).

Shrubs deciduous, 2–5 m tall; young shoots glabrous. Leaves chartaceous, in a whorl of 5 (5-subverticillate), obovate or broadly obovate, 2–4 × 1.5–2.5 cm, acute and mucronate at apex, cuneate at

base, entire, softly ciliate at margin, glabrous on both surfaces except midribs pilose; petioles 0.5–4 mm, glabrous or sparsely pilose. Inflorescences 1- or 2-flowered; pedicels 8–15 mm, glabrous. Calyx bowl-shaped, 2–3 mm diam., glabrous, lobes lanceolate or linear, 1–2 × ca. 1 mm; corolla white, rotate-funnelform, 28–33 × 30–40 mm, 5-divided, tube 10–13 mm, glabrous on both surfaces, lobes broadly ovate, 15–20 × 10–15 mm, upper lobes with green spots at base; stamens 10, unequal in length, 12–20 mm, filaments densely pilose on lower third, anthers oblong, ca. 2 mm; ovary narrowly ovoid, glabrous; style 20–27 mm, glabrous. Capsule ovoid, 7–9 × 4–5 mm, glabrous; seeds 2.5–3 × 1–1.5 mm.

Distribution and habitat. *Rhododendron quinquefolium* is known only from Honshū and Shikoku provinces in Japan. It grows in forests at 200–1800 m a.s.l.

Phenology. *Rhododendron quinquefolium* flowers from early May to mid-June, with the floral buds opening after the leaves. It fruits from September to November.

Discussion. *Rhododendron quinquefolium* is a distinctive species in its obovate leaves in a whorl of five clustered at the tops of young shoots. It resembles *R. pentaphyllum* Maxim., another species endemic to Japan, in its 5-whorled leaves. *Rhododendron pentaphyllum* is distributed in northern to central Honshū and the leaves are elliptic. *Rhododendron quinquefolium* has sometimes been recognized as a member of section *Sciadorhodion* (sensu Judd & Kron, 1995) and is closely related to two other members of section *Sciadorhodion*, *R. pentaphyllum* and *R. schlippenbachii*, in having five leaves forming a whorl at the tip of the branches (Judd & Kron, 1995). However, both flowers and leaves emerge from the same mixed buds in *R. quinquefolium*, and for this reason we regard it as a member of section *Brachycalyx*.

Additional specimens examined. JAPAN. **Honshū:** Pref. Fukushima: Nishishirakawa-gun, Saigo-mura, *G. Murata et al. 68817* (KYO), *68818* (KYO); Ishiki-gun, Mt. Akai, *H. Hara s.n.* (TI). Pref. Gifu: Mugi-gun, Itadori-mura, *H. Takahashi 20505* (KYO). Pref. Hyogo: Mt. Rokko, *S. Okamoto 20052* (TI), *T. Tashiro s.n.* (KYO, TNS). Pref. Ibaraki: Kitaibaraki-shi, Mt. Hanasyuu, *N. Wada 3324* (KYO). Pref. Kanagawa: Ashgarakami-gun, Yamakita-machi, *Y. Hassegama 14633* (KYO); Hakone, Mt. Kintoki, *T. Sawada 841* (KYO, TI), *T. Sawada s.n.* (TI), *H. Yamamoto s.n.* (TNS), *N. Masuda s.n.* (TNS). Pref. Mie: Mitsukuchi-dani, Mie-gun, near Mt. Yuno, *K. Iwatsuki & N. Kitagawa 74* (KYO); Mie-gun, Mt. Gozaisyo, *M. Hiroe 12944* (KYO); Mie-gun, Hirauar, *G. Murata & N. Fukuoka 37* (P, TI); Komonocho, *Kato 6039* (TI); Ichishi-gun, Yawata-mura, *H. Kanai s.n.* (TI); Ise, a valley of Ohsugitani, *Anon. s.n.* (TI); Ise, Mt. Yuno, *H. Hara s.n.* (TI), *Kuwashima s.n.* (TNS). Pref. Miyagi: Miyagi-gun, Jogi, *H. Ohba & K. Otomo s.n.* (B, KYO, P, PE, TI); Katta-gun, *T. Naito 72512* (B,

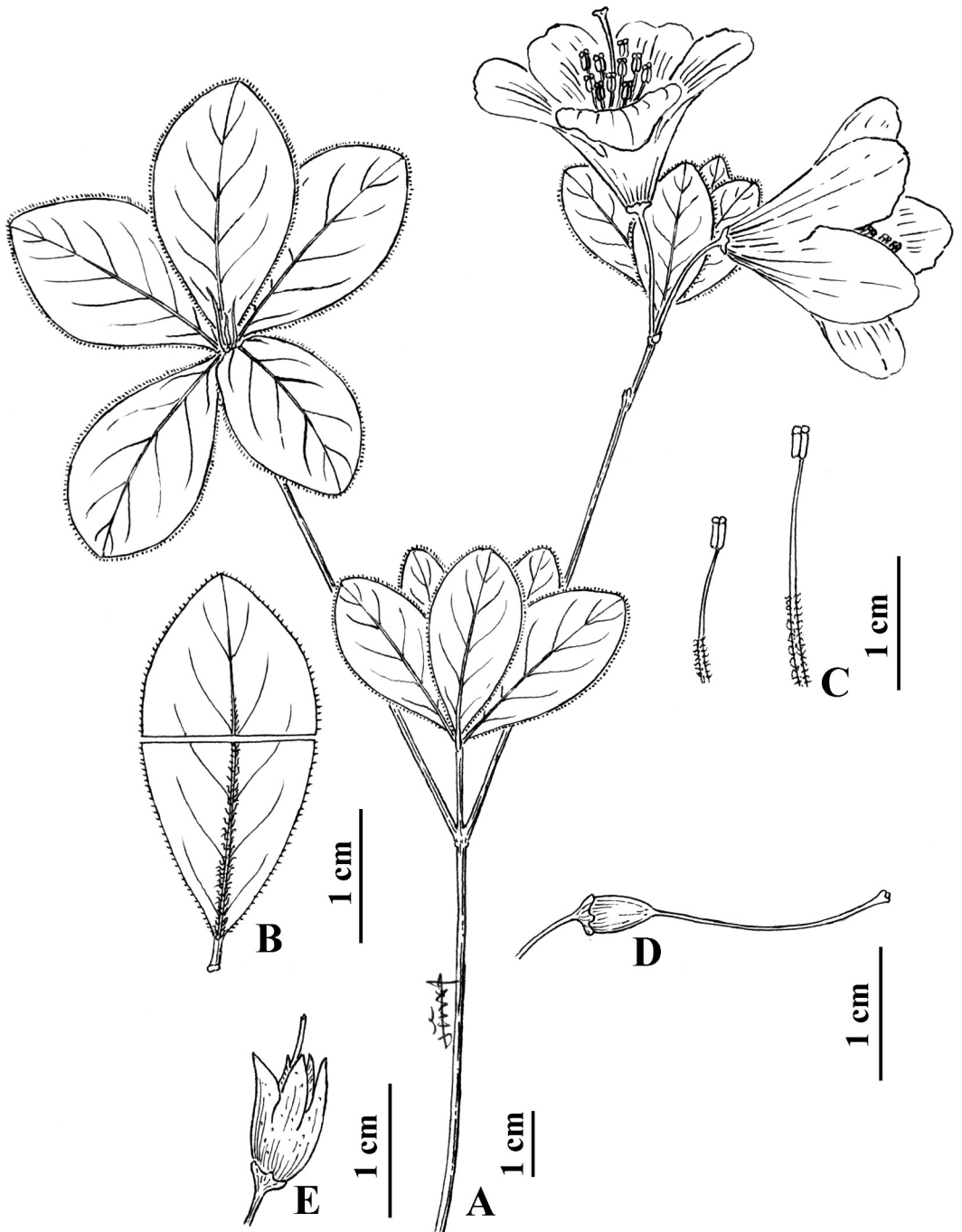


Figure 5. *Rhododendron quinquefolium* Bisset & S. Moore. —A. Flowering shoot. —B. Leaf, showing indumentum. —C. Stamen. —D. Style and ovary. —E. Capsule. A–D from *S. Kawatsuki s.n.*; E from *Kanai s.n.*

KYO); Shibata-gun, *H. Ohba & M. Yashima s.n.* (TI); Iwanuma City, Taketoma, *M. Honda s.n.* (TI); Sekiyamatouge, *T. Tashiro s.n.* (KYO). Pref. Nagano: Shinano, Shimoina-gun, Hiraokamura, *K. Katsumata 15675* (TI). Pref. Nara: Yoshino-gun, Kamikitayama-mura, *G. Murata 70385* (KYO), *H. Migo s.n.*

(NAS); Yoshino-gun, Kamikitayama-mura, Mt. Omine, *H. Okada 1385* (KYO), *1405* (KYO), *S. Tsugaru et al. 7910* (TNS), *G. Murata s.n.* (TNS); Mt. Daifuken, *M. Hotta & H. Fujiwara 33* (KYO); Ohdaigahara, *T. Yamazaki et al. 892* (TI, TNS); Mt. Ohmine, *H. Hara s.n.* (TI), *M. Togasi s.n.* (TI), *483*

(B, KYO, P, W). Pref. Shiga: Mt. Hira, Kanakusotoge, *G. Murata 44451* (KYO, TI); Yakumogohara, Mt. Doman, *M. Ito 1240* (TI); Oumi, Ohara-mura, *N. Hashimoto s.n.* (TNS). Pref. Shizuoka: Haibara-gun, Honkawane-cho, *H. Koyama 80* (KYO), *Mastuda s.n.* (TI); Haibara-gun, *T. Yamazaki 6215* (TI); Godenba, Mt. Fuji, *M. Hireo 17713* (KYO); Shizuoka-shi, Abetoge, *Yamazaki & Matsuda s.n.* (TI); Yamazumi, Mt. Zyokozi, *T. Yamazaki 6215* (TI); middle of Oigawa, *T. Yamazaki s.n.* (TI); Abe-gun, *J. Murata & T. T. Chen 9699* (IBSC, SZ, TI); Misakubo, Yamazumi, *T. Yamazaki 6790* (TI). Pref. Tochigi: Uraminotaki, *H. Ohba & S. Akiyama 1176* (TI); Nikko-shi, *J. Murata 1776* (PE, TI), *M. Togashi s.n.* (TI), *H. Idzumi & M. Togashi s.n.* (P, PE); Nikko-shi, Tyuzenji, *T. Yamazaki s.n.* (TI); Nikko-shi, Cyuenji, *M. Togashi s.n.* (TI); Nikko-shi, *H. Kubota 522* (B, KYO, P, W); Ashiocho, Mt. Yokone, *H. Hara s.n.* (TI); Owaki, Mt. Yamizo, *K. Sohna & H. Hashi 101* (TI); Kwoiso-shi, *A. Kimura s.n.* (PE). Pref. Tokyo: Okutama, Izudake, *S. Okuyama s.n.* (KYO); Okutama, Nippara, *S. Okuyama s.n.* (TNS); Okutama, Mt. Ohdakesan, *H. Hisouchi s.n.* (TNS). Pref. Wakayama: Arita-gun, Yawatamura, *S. Okamoto 8417* (TI). **Shikoku:** Pref. Ehime: Mt. Iwaguro, *J. Murata et al. 109* (KYO), *070* (KYO). Pref. Tokushima: Mt. Takagi, *G. Murata et al. 56047* (KYO); Naka-gun, *K. Abe 19* (TI); Mt. Higashiiyayama, *Anon. 53685* (TI).

6. *Rhododendron tashiroi* Maxim., Bull. Acad. Imp. Sci. Saint-Petersbourg, ser. 3(31): 64. 1887. *Azalea tashiroi* (Maxim.) H. F. Copel., Amer. Midl. Naturalist 30: 597. 1943. TYPE: Japan. "Southern islands, Tanega-sima," s.d., *Y. Tashiro s.n.* (holotype, LE not seen). Figure 6.

Rhododendron tashiroi Maxim. var. *lasiophyllum* Hatus. ex T. Yamaz., Fl. Jap. (Iwatsuki et al., eds.) (ed. 2) 3a: 31. 1993. TYPE: Japan. Kyūshū: Kagoshima, Kasedashi, Mt. Choya, 16 Apr. 1967, *H. Hatusima & S. Sako 30554* (holotype, TI!).

Shrubs evergreen, 1.5–4 m tall, sometimes to 6 m; young shoots hirsute, later glabrescent. Leaves coriaceous, in whorls of 2 or 3 (opposite or verticillate), elliptic-ovate, elliptic-obovate, or oblong-elliptic, 3–6.5 × 1–3 cm, acute or shortly acuminate, with an apical gland, cuneate at base, entire or minutely denticulate at margin, with appressed, cinereous-brown trichomes on both surfaces, glabrescent or sparsely hispid on dorsal surfaces except midribs hispid; petioles 2–6(–10) mm, with appressed brown trichomes. Inflorescence 2- to 5-flowered; pedicels 6–15 mm, with brown indument. Calyx bowl-shaped, ca. 3 mm diam., densely strigose, lobes inconspicuous; corolla pale rose-purple or pale pink, broadly funnellform, 25–35 (–40) × 30–40 mm, deeply 5-divided, corolla tube 10–13 mm, glabrous on both surfaces, lobes oblong, 20–25 × 10–12 mm, upper lobes with dark purple spots, sometimes without dark spots; stamens 10, rarely 9 or 12, unequal in length, 15–30 mm, filaments glabrous, anthers oblong, ca. 2 mm; ovary ovoid, densely villose; style 25–35 mm, glabrous.

Capsule obliquely cylindrical or narrowly ovoid, 9–13 × 5–6 mm, densely to sparsely hirsute; seeds 1–1.5 × 0.4–0.7 mm.

Distribution and habitat. *Rhododendron tashiroi* has been collected from Taiwan, China, as well as from Kyūshū and Shikoku provinces in Japan. It grows in forests or at forest margins at 200–1300 m a.s.l.

Phenology. *Rhododendron tashiroi* flowers from mid-March to early May and fruits from August to November.

Discussion. Yamazaki described and published a variety of *Rhododendron tashiroi* (Yamazaki, 1993), considering variety *lasiophyllum* distinct from the taxon by its leaves pubescent on the abaxial surface. After examining the type and additional specimens, we determine that this character is not stable, and that pubescent and glabrous leaves can be seen within the same specimen or even along the same young shoot (e.g., *A. Naiki 5284*; *S. Fujii 9134, 9366*; *H. Hatusima 16394*). We therefore reduce *R. tashiroi* var. *lasiophyllum* to synonymy with *R. tashiroi*.

Based on this species, Sleumer (1980) established section *Tsusiopsis*, and this section differed from section *Brachycalyx* in having evergreen leaves, with the leaf blades and young shoots sometimes hirsute. He (1994) as well as He and Chamberlain (2005) followed this treatment, but Chamberlain and Rae (1990) transferred the species to section *Tsutsusi* Sweet. Yamazaki (1993, 1996) synonymized section *Tsusiopsis* within subgenus *Sciadorhodon*. Yamazaki (1993) later considered this within section *Brachycalyx* (sensu Sleumer, 1949). Pollen of *Rhododendron tashiroi* is tricolporate, subspheroidal, and conspicuously granulated (Zhang et al., 2009). Based on the leaf indumentum, leaf arrangement, and pollen micromorphology, *R. tashiroi* is similar to other taxa in section *Brachycalyx* more so than to taxa of section *Tsutsusi* (Jin, 2006; Zhang et al., 2009). Leaves of section *Tsutsusi* are aggregately arranged at branch apices, and the leaf indumentum is strigose or strigose with glandular trichomes. Pollen grains of section *Tsutsusi* are smaller than those of *R. tashiroi*, and the exine sculpturing is compact granulated (Zhang et al., 2009).

Additional specimens examined. CHINA. **Taiwan:** Gao-xiong, Mt. Oodake, *J. Ohwi 1742* (KYO), *1854* (KYO). JAPAN. **Kyūshū:** Pref. Kagoshima: Isl. Amami, *S. Saito 9487* (PE); Isl. Amami, Ooshima-gun, Uken-mura, Mt. Yuwan-dake, *A. Yamamoto et al. 595* (TNS), *A. Naiki 5531* (KYO); Isl. Amami, Yuwan-dake, *H. Migo 26282* (TNS), s.n. (TNS), *H. Yamamoto s.n.* (TNS); Isl. Amami, Ooshima-gun, Uken-mura, *J. Murata & Y. Endo 150* (PE, SZ); Isl. Amami, Ooshima-gun, Sumiyo-mura, Nishi-nakama, *H. Idzumi s.n.* (TNS), *G. Murata 56329* (KYO); Isl. Amami, Ooshima-gun, Sumiyo-mura, *S. Noshiro et al. D433* (TI), *H. Idzumi & M.*

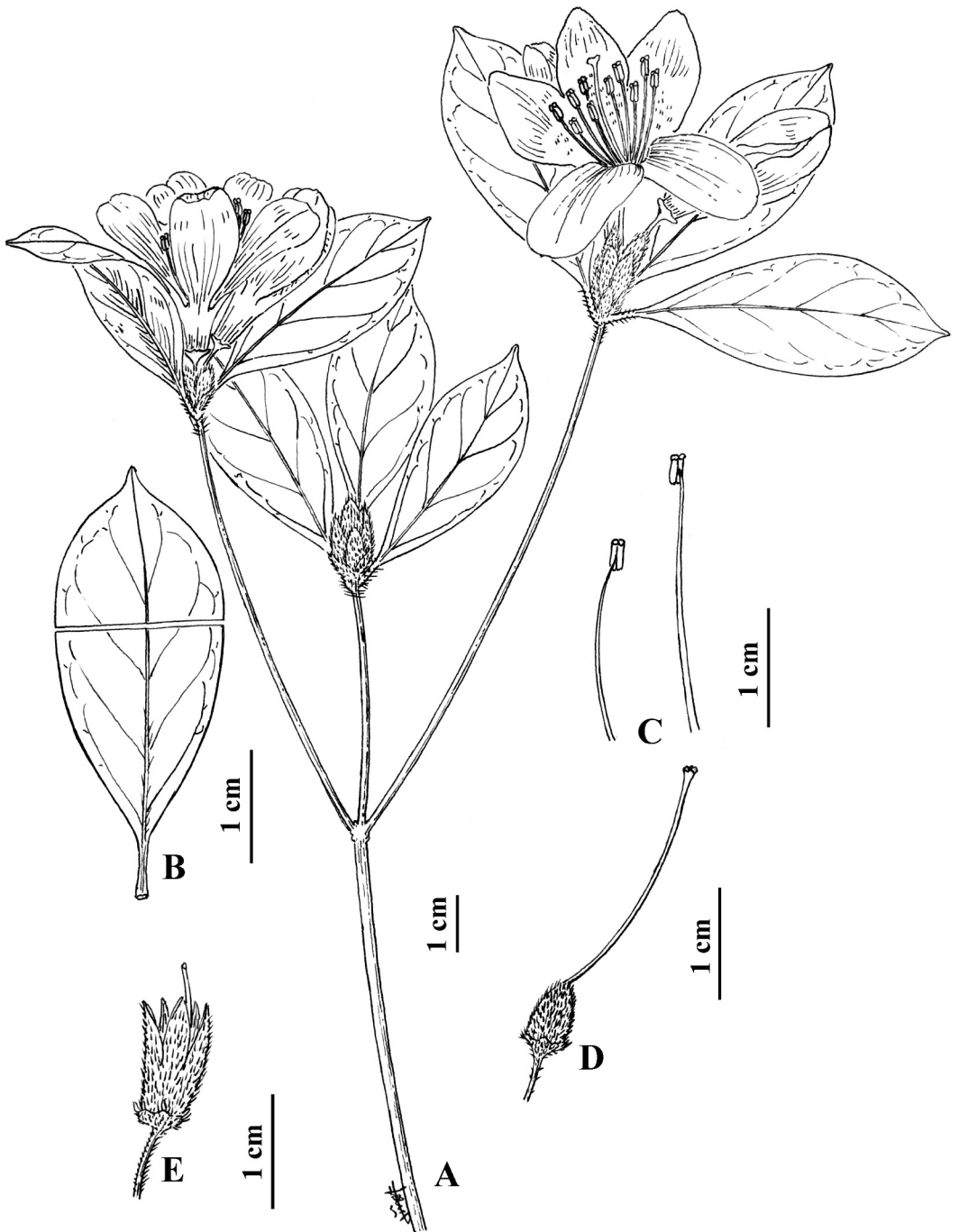


Figure 6. *Rhododendron tashiroi* Maxim. —A. Flowering shoot. —B. Leaf, showing indumentum. —C. Stamen. —D. Style and ovary. —E. Capsule. A–D from S. Noshiro et al. D433; E from Y. Miyagi 1960.

Togashi 74-4-1 (P), A. Yamamoto 186 (TNS); Isl. Amami, Ooshima-gun, J. Murata & Y. Endo 150 (PE); Ooshima-gun, Yakushima, Onagonita, Mt. Motchom, H. Doei 48 (KYO); Isl. Yakushima, Yaku-cho, G. Murata & H. Tabata 393 (P); Isl. Yakushima, Ambo, M. Togasi 1460 (B, KYO, P, PE); Isl. Yakushima, N. Fukuoka & M. Okamoto 1078 (KYO), T.

Hamaya s.n. (TI), S. Saito 1557 (PE, TI), G. Murata et al. 286 (TI), 88 (TI), T. Yahara et al. 10528 (TI), 10538 (TI), 10544 (TI), 10237 (TI), 10209 (TI), 6026 (PE, SZ), 10036 (P, PE); Isl. Yakushima, Ohkawa-rindo, Z. Sato s.n. (TI); Ooshima-gun, Tokunoshima-cho, S. Kobayashi 1960 (TI); Isl. Amami-ohshima, Mt. Takabachi, S. Mitsuata & H. Nagamasu 1035

(KYO), *M. Ozawa s.n.* (TI); Isl. Amami-ohshima, Mt. Yuwan, *S. Saito 4076* (TI), *9487* (TI), *K. Enomoto s.n.* (TI), *J. Murata & Y. Endo 150* (TI), *J. Murata 4966* (TI); Isl. Amami, *Nase, Y. Miyagi 8698* (TI); Isl. Amami, *S. Sako 3955* (TI); Isl. Tokuno-shima, Tokunoshima-cho, Mt. Inokawa, *G. Murata 56257* (KYO); Isl. Tokuno-shima, Radio-tower of NHK, *J. Murata 9354* (KYO); Isl. Tokuno-shima, *H. Nagamasu 1771* (KYO); Isl. Tokuno-shima, Mt. Inokawa, *S. Takairo 85-223* (TI), *H. Ohba 863063* (TI); Kumage-gun, Yaku-cho, Mt. Kuniwaridake, *T. Yahara et al. 9186* (KYO); Ohsumi Peninsula, Yakushima, *G. Koizumi s.n.* (KYO); Ohsumi, Mt. Takakuma, *Kouishi, T. Tashiro s.n.* (KYO); Ohsumi, Mt. Takakuma, *K. Kunitake 2488* (TI); Mt. Han, Kamiyaku-cho, Kumago-gun, *H. Takasaki 80043* (KYO); from Isl. Tokara to Isl. Nakanoshima, Mt. Otake, *A. Naiki 5284* (KYO); Kagoshima-gun, Mt. Yagura, *S. Fujii 9366* (KYO); Noma-hanshima Peninsula, *T. Tashiro s.n.* (KYO, TI); Kagoshima-shi, *T. Yamazaki & H. Ohba 521* (TI); Kagoshima-gun, Mishima-mura, Mt. Yokodake, *S. Fujii 9134* (KYO); Kawanabe-gun, *T. Yamazaki s.n.* (TI); Kawanabe-gun, Mt. Nomadake, *S. Hatusima 16394* (KYO), *Anon. 6794* (TI), *I. Enomoto 11169* (TI), *s.n.* (TI); Isl. Kuchino-shima, Toshima-mura, *K. Imamura 78* (KYO); Isl. Kuchino-shima, Isl. Tokara, *S. Sako 7178* (TI); Kimotsuki-gun, Ohnezime-cho, *K. Maruno 6397* (PE, TI); Kimotsuki-gun, Oonejime-cho, *K. Maruno s.n.* (TI); Kawabe-gun, Bonotsu-machi, *M. Togashi s.n.* (P, TI); s. loc., *T. Tashiro s.n.* (KYO). Pref. Miyazaki: Mt. Waniyuka, *K. Kondo s.n.* (TI). Pref. Okinawa: Kunigami-gun, Kunigami-mura, Mt. Yonaha-dake, *S. Fujii 1795* (TNS), *1801* (TNS), *K. Iwatsuki et al. 13* (KYO), *H. Mito s.n.* (TNS); Kunigami-gun, *S. Noshiro & M. Suzuki 4992* (PE); Isl. Okinawa, Mt. Yonaha, *H. Kanai et al. 732596* (TNS), *S. Mitsuta & H. Nagamasu 764* (KYO), *S. Mitsuta 1780* (KYO); Isl. Okinawa, Tanaga-gumui, near Aha, *H. Kanai 732559* (TNS); Ryukyu, *M. Nakahara 24140* (TNS). Pref. Saga: Usushi, *Haba 6* (TNS), *Kuranari s.n.* (TI, TNS), *I. Enomoto s.n.* (TI); Usushi, Mt. Shiro, *Haba s.n.* (KYO); Mt. Kusenbu, *S. Yamaguchi 6884* (TI); Miyaki-gun, Tashiro-mura, *I. Enomoto s.n.* (TI). **SHIKOKU:** Pref. Kochi: Tosakuni, Aki-gun, *I. Enomoto s.n.* (TI).

7. *Rhododendron wadanum* Makino, J. Jap. Bot. 1: 21. 1917. *Rhododendron reticulatum* D. Don ex G. Don var. *wadanum* (Makino) Hatus., Sci. Rep. Yokosuka City Mus. 15: 22. 1969. TYPE: Japan. Honshū: Pref. Kanagawa, Hakone, Mt. Kintokiyama, 15 May 1927, *T. Sawada s.n.* (lectotype, designated here, TI!). Figure 2A–E.

Rhododendron wadanum Makino f. *kaiense* Hiyama, J. Jap. Bot. 28: 217. 1953, as “*kaiensis*.” TYPE: Japan. Honshū: Pref. Kai, Mt. Mitsutage, 12 May 1938, *K. Hiyama s.n.* (holotype, TNS!).

Rhododendron wadanum Makino var. *leucanthum* Makino, J. Jap. Bot. 3: 11. 1926. *Rhododendron wadanum* Makino f. *leucanthum* (Makino) H. Hara, Enum. Spermatophytarum Japon. 1: 56. 1948. TYPE: Japan. Honshū: Pref. Kanagawa, Sagami, Hakone, *T. Sawada s.n.* (holotype, MAK not seen).

Rhododendron wadanum Makino f. *kaimontanum* Okuyama, J. Jap. Bot. 24: 112. 1949. TYPE: Japan. Honshū: Pref. Kai, 5 June 1949, *S. Okuyama s.n.* (holotype, TNS!).

Shrubs deciduous, 1.5–3 m tall; young shoots glabrous. Leaves chartaceous, in a whorl of 3 (3-verticillate), ovate-rhombic or rhombic, 3–7 × 2–6 cm, acute and mucronate at apex, cuneate or rounded at base, entire or sometimes minutely denticulate at margin, sparsely villose on dorsal surfaces, densely so on midribs dorsally, glabrous on ventral surfaces; petioles 3–7 mm, densely villose. Inflorescences 1- or 2-flowered; pedicels 4–10 mm, pilose and glandular. Calyx bowl-shaped, ca. 3 mm diam., sparsely pubescent, lobes inconspicuous; corolla purple or rose-pink, rotate-funnelform, 25–30 × ca. 40 mm, deeply 5-divided, corolla tube ca. 7 mm, glabrous on both surfaces, lobes obovate to oblong, 17–20 × ca. 10 mm, upper lobes with dark purple spots at base; stamens 10, unequal in length, 10–25 mm, filaments glabrous; anthers oblong, ca. 2 mm; ovary ovoid, densely villose; style 30–35 mm, glandular. Capsule obliquely oblong-ovoid, 10–13 × ca. 5 mm diam., hirsute; seeds 0.8–1.2 × 0.4–0.5 mm.

Distribution and habitat. *Rhododendron wadanum* is endemic and known only from Honshū Province in Japan. It grows in mixed forest at 900–1500 m a.s.l.

Phenology. *Rhododendron wadanum* flowers from mid- to late May, with the flowers opening before or with the emergence of leaves. It fruits from August to October.

Discussion. *Rhododendron wadanum* is similar to *R. farrerae* in its 3-verticillate leaves and 1- or 2-flowered inflorescences, but differs in its styles with glandular trichomes.

Makino (1917: 21) described *Rhododendron wadanum* as a new species, but no collection or illustration was indicated as type. Although this species was not validly published, its glandular styles distinguish it from the other species of section *Brachycalyx*; we therefore designate as lectotype here the collection *T. Sawada s.n.* (TI), a flowering specimen in good condition.

Rhododendron wadanum f. *kaimontanum* was described by Okuyama (1949) and distinguished by its 1- or 2-flowered inflorescences. However, for the 10 inflorescences seen for its holotype, eight had only one flower. Therefore, we reduce this form to synonymy with *R. wadanum*.

Additional specimens examined. JAPAN. **Honshū:** Pref. Aichi: Danryou-mura, *K. Torii 10526* (KYO). Pref. Fukui: Mugi-gun, Itadori-mura, Mt. Takiba, *H. Takahashi 7161* (KYO). Pref. Fukushima: s. loc., *G. Murata et al. 68709* (KYO); Nishishirakawan-gun, *H. Hara s.n.* (TI); Nishishirakawan-gun, Saigo-mura, *G. Murata et al. s.n.* (KYO); Date-gun, *H. Hara s.n.* (TI); Iwaki-city, Zaimouwa, *Hayakawa 77* (TI); Shinobu-gun, Azuma-cho, Takayu, *G. Nakahara s.n.* (KYO); Futaba-gun, Naraha-machi, *T. Nemoto 2952* (KYO); Shirakawa-gun, Tanagura-machi, *T. Fukuda & K. Yoshima*

980424203 (PE). Pref. Gifu: Mino-City, Hirugano, Gujyo-gun, Takasu-mura, *G. Murata 16163* (KYO); Guji-gun, Myogata-mura, *H. Takahashi 6232* (KYO); Fuha-gun, from Sekigahara-cho to Myojin-pass, *G. Murata & T. Shimizu 1592* (KYO), *1606* (KYO); Mashita-gun, Hagiwara-cho, Mt. Gozen, *G. Murata 28* (KYO); Motosu-gun, Neo-mura, Midori-dani, *H. Takahashi 17048* (KYO). Pref. Gunma: Akagi-gun, *Z. Sato s.n.* (TI); Kiryu-shi, Mt. Narukamiyama, *J. Murata et al. 11018* (KYO, PE); Usui-gun, Hakuunzan in Mt. Myogi, *G. Murata 27468* (KYO); Tano-gun, Onishi-machi, Shimokubo, *J. Murata 1655* (KYO). Pref. Ibaraki: Kuji-gun, Suifu-mura, *N. Wada 3445* (KYO); Kitaibarakishi, Mt. Hanasyuu, *N. Wada 235* (KYO). Pref. Kanagawa: Hakone, Mt. Myoujin, *T. Sawada s.n.* (TI); Ashigarashimo-gun, Hakone, Mt. Kami, *J. Murata 547* (KYO). Pref. Mie: Toba-shi, Nakazato-mura, Mt. Kano, *J. Murata et al. 105224* (KYO); Kamagatake, Mie Co., *M. Hiroe 13082* (KYO); Suzuka-gun, Mt. Monobori, *T. Shimizu 4073* (KYO); Ise, Mitsukuchidani, Mt. Kamagadake, *G. Murata 11257* (KYO), *11260* (KYO); Ise, Kitadani, Mt. Gozaishyo, *G. Murata & S. Kitamura 1568* (KYO); Inabegen, Hokusei-cho, from Kawaharagoe to Kawahara, *N. Kurosaki 14917* (KYO). Pref. Miyagi: Sendai-shi, Mt. Aoba, *M. Yashima s.n.* (KYO). Pref. Nagano: Minamisaku-gun, Kawakami-mura, *M. Hotta 12217* (KYO); Shinano, Minamisaku-gun, from Mt. Azusa to Mt. Mikuni, *G. Murata 11824* (KYO); Shinano, Shimoina-gun, Ohshika-mura, Aokigawa, *T. Yamazaki 9910* (TI); Shinano, Shimoina-gun, *K. Katsumata 16544* (TI), *K. Asano 9873* (TI); Suwa-gun, Fujimi-machi, *M. Mizushima s.n.* (TI); Tobira, *H. Ohashi & H. Ohba 364* (TI); Karuizawa, *S. Watari s.n.* (TI); Kiso-gun, Agematsu-cho, Akasawa, *Murata & Tsuchiya s.n.* (KYO); Komagane-shi, Kyrokawa, *H. Kanai s.n.* (TI); Takatoku, *J. Ohwi & K. Okamoto 442* (B, KYO, P, W). Pref. Saitama: Iruma-gun, from Mt. Kuro to Kooburi Pass, *H. Ohashi et al. 1381* (KYO, PE). Pref. Shiga: Mt. Gozaisho, Buheitego, *G. Murata 21045* (KYO). Pref. Shizuoka: Shizuoka-city, *F. Konta et al. 117* (KYO), *E. Miki 158* (KYO), *165* (KYO), *Y. Kamiyo 177* (KYO); Tagata-gun, Mts. Amagi, *N. Fukuoka 7252* (P, PE), *N. Fujita & M. Katayama 3* (KYO), *H. Ohashi et al. 2040* (KYO, PE), Mts. Amagi, Mt. Togasa, *N. Fukuoka 7242* (KYO), *J. Sugimoto s.n.* (KYO); Mt. Ashitaka, *M. Togashi s.n.* (KYO); Haibara-gun, Honkawane-cho, Mt. Fudou, *H. Koyama et al. 46* (KYO); Kamo-gun, Hichisou-cho, Murokane, *H. Takahashi 14722* (KYO); Fujimomiya-shi, Mt. Kenashi, *S. Horino et al. 610* (KYO). Pref. Tochigi: Kuroisocity, Mt. Nasu, *S. Noshiro 4925* (KYO); Nikko-shi, *J. Matsumura 5813* (TI), *5814* (TI), *M. Mizushima s.n.* (KYO), *T. Makino s.n.* (KYO), *H. Ohashi et al. 11214* (IBSC), *11603* (PE); Nikko-shi, Mt. Akanagi, *M. Tagawa & G. Murata 36* (KYO), *53* (KYO); Nikko-shi, Jakkonotaki Fall, *H. Ohashi et al. 11603* (KYO), *11605* (KYO); Nasu-gun Nasu-cho, *A. Kimura s.n.* (PE). Pref. Tokyo: Nishitama-gun, *J. Matsumura s.n.* (TI). Pref. Yamagata: Mt. Azuma, *H. Hara s.n.* (TI). Pref. Yamanashi: Uchino, Minamitsuru-gun, Oshino-mura, *M. Togashi s.n.* (KYO, P); Minamitsuru-gun, Mt. Mitsutoge, *N. Fukuoka 6676* (KYO), *6672* (KYO); Minamitsuru-gun, *H. Kanei s.n.* (TI), *M. Togashi s.n.* (TI), *J. Murata 11108* (TI), *T. Satou 1686* (TI); Minamitsuru-gun, Yamanakako-mura, *M. Togashi s.n.* (TI, KYO); Mt. Daibosatsu, *G. Murata 16940* (KYO); Nishiawa, *H. Funakoshi 35* (TI); Mt. Komagadake, *Z. Sato s.n.* (TI), *G. Murata 11947* (KYO); Mt. Fuji, *Y. Satake 47* (TI), *T. Sawada s.n.* (TI); Mt. Fuji, Yoshidaguchi, *M. Togashi s.n.* (KYO).

8. *Rhododendron weyrichii* Maxim., Mém. Acad. Imp. Sci. St-Petersbourg, ser. VII, 16: 26, t. 2: 1–

6. 1870. TYPE: Japan. “In Archipelago Gotto, Insula Sylvestri, 1853,” *H. Weyrich s.n.* (holotype, LE not seen). Figure 7.

Rhododendron shikokianum Makino, Bot. Mag. Tokyo 6: 53. 1892. TYPE: Japan. Shikoku: Pref. Kochi, Takaokagun, Sakawa Town, 1889, *T. Makino s.n.* (holotype, MAK not seen, photo!; isotype, K not seen).

Rhododendron weyrichii Maxim. f. *albiflorum* T. Yamaz., Fl. Jap. (Iwatsuki et al., eds.) (ed. 2) 3a: 31. 1993, syn. nov. TYPE: Japan. Shikoku: Pref. Kochi, cult. Tokyo, May 1989, *T. Yamazaki s.n.* (holotype, TI!).

Rhododendron weyrichii Maxim. var. *psilostylum* Nakai, Bot. Mag. (Tokyo) 40: 487. 1926, syn. nov. TYPE: Korea. Chejudo Island (Taquet), July 1911, *Anon. 5785* (holotype, TI!).

Rhododendron weyrichii Maxim. f. *purpuriflorum* T. Yamaz., Fl. Jap. (Iwatsuki et al., eds.) (ed. 2) 3a: 31. 1993, syn. nov. TYPE: Japan. Honshu: Pref. Mie, cult. Tokyo, 28 Apr. 1964, *I. Enomoto s.n.* (holotype, TI not seen).

Shrubs deciduous, 2–5 m tall; young shoots with brown trichomes, later glabrescent. Leaves chartaceous, usually in a whorl of 3 (3-verticillate), broadly rhombic-ovate, 3.5–8 × 2–6 cm, acute and mucronate at apex, rounded at base, minutely denticulate at margin, pubescent on both surfaces, later glabrescent; petioles 5–10 mm, sparsely pubescent. Inflorescences 2- to 3-flowered; pedicels 4–8 mm, densely pilose. Calyx bowl-shaped, ca. 3 mm diam., densely pubescent, lobes inconspicuous; corolla red, rarely purple or white, broadly funnelform, 35–40 × 45–50 mm, deeply 5-divided, tube ca. 15 mm, glabrous on both surfaces, lobes elliptic, 20–30 × 15–20 mm, upper lobes with dark red spots at base; stamens 10, unequal in length, 10–30 mm, filaments glabrous, anthers oblong, ca. 2 mm; ovary ovoid, densely villose; style 35–40 mm, glabrous. Capsule obliquely cylindrical, 10–20 × 5–6 mm, densely pilose; seeds 1.2–1.7 × 0.5–0.6 mm.

Distribution and habitat. *Rhododendron weyrichii* has been collected from Honshu, Shikoku, and Kyushu provinces in Japan, as well as from southern inland Korea. It grows in closed forests, under forest, or on slopes at 200–1000 m a.s.l.

Phenology. *Rhododendron weyrichii* flowers from mid-April to mid-May, opening before or with leaves. It fruits from late August to mid-October.

Discussion. *Rhododendron weyrichii* is similar to *R. amagianum* in having large flowers often red in color and corollas that exceed 35 mm in length. Corollas of *R. weyrichii* are red, rarely purple or white, and 35–40 mm long, while those of *R. amagianum* are purplish red or red, rarely white, and 35–45 mm long. However, *R. weyrichii* differs from *R. amagianum* in having young leaves with brown pubescence and sparsely pubescent petioles. *Rhododendron amagianum* has young leaves

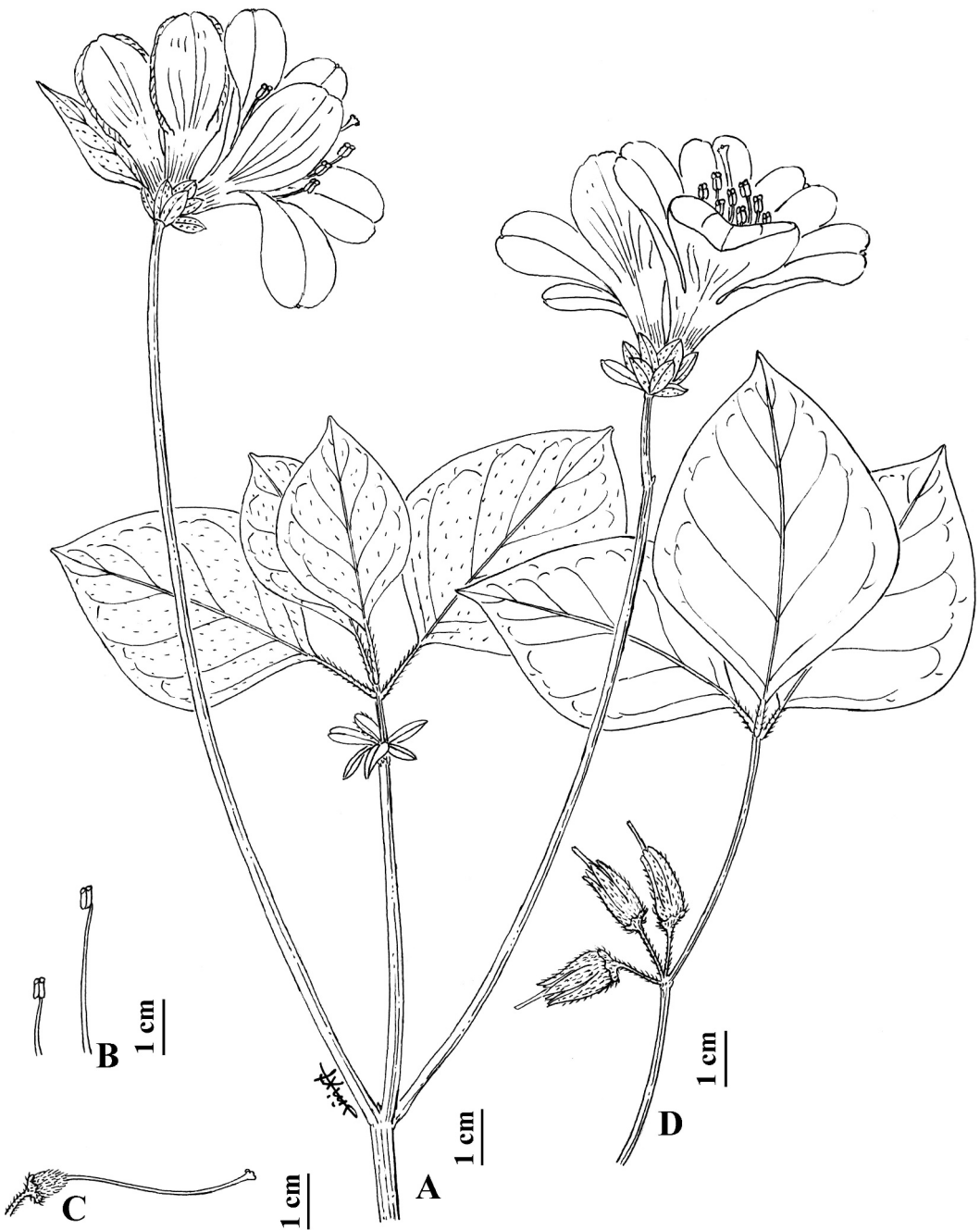


Figure 7. *Rhododendron weyrichii* Maxim. —A. Flowering shoot. —B. Stamen. —C. Style and ovary. —D. Fruiting shoot. A–C from X. F. Jin 1426; D from S. Saito 3065.

that are glabrous dorsally except for the densely villose midribs and villose petioles.

The white- and purple-flowered forms were named forma *albiflorum* and forma *purpuriflorum* by Yamazaki (1993: 31). These two taxonomic entities are each known from only one specimen and cannot be differentiated in

geographic region or altitude. They are therefore reduced here to synonymy with *R. weyrichii*.

The variety *Rhododendron weyrichii* var. *psilostylum* differed from the typical entity in having pubescence on the style base, but the indumentum of the style base is not sufficient to distinguish the

variety from *R. weyrichii* (Yamazaki, 1996). Variety *psilostylum* is therefore placed here as a synonym of *R. weyrichii*.

Additional specimens examined. JAPAN. **Honshū:** Pref. Mie: Ise, Watarai-gun, Oomiya-cho, Takihara, *G. Koizumi s.n.* (KYO); Minamimuro-gun, *T. Tashiro s.n.* (KYO); Minamimuro-gun, Mihama-cho, *Koide s.n.* (KYO); Kitamuro-gun, Sugari-mura, *Anon. s.n.* (KYO), *G. Nakai 4299* (KYO); Owase-shi, Kowa-dani, *M. Furuse s.n.* (KYO); Kumano-shi, Arima-cho, *T. Koide 401* (KYO). Pref. Wakayama: Higashimuro-gun, *Koide s.n.* (KYO); Shingu-city, Ukishima, *K. Iwatsuki s.n.* (KYO). **Kyūshū:** Pref. Kagoshima: Kushikino-shi, *Anon. s.n.* (TNS); Bonotsu, Shiku, *M. Togashi s.n.* (TNS); s. loc., *T. Makion s.n.* (TNS). Pref. Kumamoto: Amakusa-gun, *Torida 14163* (KYO). Pref. Miyazaki: Hyuga, Koyu-gun, Kijo-cho, Mt. Osuzu, *X. F. Jin 1426* (HZU), *1435* (HZU), *1436* (HZU); Kozima-gun, *Sameshima s.n.* (KYO); Hyuga, Hori, Mt. Okue, *S. Hatusima & S. Sako 25100* (KYO); Hyuga, *Sameshima s.n.* (KYO); Hyuga-shi, *Sameshima s.n.* (KYO); Higashiusuki-gun, Kitagawa-cho, Mt. Okue, *T. Yahara & M. Ito 4826* (KYO); Nobeoka-shi, Shiohama, *J. Murata 3546* (KYO, PE). Pref. Nagasaki: Isl. Fukue-zima, Tamanoura-cho, from Arakawa to Mt. Nanatsu-dake, *S. Mitsuta 12299* (KYO), *G. Murata & H. Koyama 14522* (KYO), *N. Fujita & S. Mitsuta 327* (KYO), *280* (KYO); Isl. Fukuejima, Ara-kawa, *T. Tashiro s.n.* (KYO); Omura-shi, *S. Toyama s.n.* (KYO), *T. Tashiro s.n.* (KYO). Pref. Oita: Oono-gun, Ogata-cho, Mt. Katamuki, *N. Fukuoka 7224* (KYO), *S. Kitamura s.n.* (KYO); Oono-gun, *T. Tashiro s.n.* (KYO). Pref. Saga: s. loc., *S. Tokuraga s.n.* (KYO). **Shikoku:** Pref. Ehime: Minami-Uwa-gun, Uchiimi-mura, *N. Fukuoka 8731* (KYO); Uwajima-shi, *M. Ogata s.n.* (KYO); Nishiuwa-gun, Mikame-cho, Izumi, *N. Kurosaki 7168* (KYO); Nishiuwa-gun, Ikata-cho, *Y. Nomura 21* (KYO); Higashiuma-gun, Nomura-cho, Okanaru, *H. Koyama & G. Murata s.n.* (P). Pref. Kagawa: Sakaide-city, Mt. Kuronomine, *H. Koyama et al. 4346* (KYO); Nakatado-gun, Kotonami-cho, Mt. Ohkawa, *M. Takahashi 1904* (KYO, PE). Pref. Kochi: Mt. Shirao, *G. Murata 17844* (KYO); Sukumo-shi, Katashima, *S. Kitamura & G. Murata 2618* (KYO); Takaoka-gun, Niyadao-mura, *T. Shimizu 05905* (KYO), *05920* (KYO); Takaoka-gun, Higashitsuno-mura, *G. Murata & T. Shimizu 2463* (KYO); Takaoka-gun, Yuzuhara-mura, *G. Murata & T. Shimizu 2545* (KYO), *2487* (KYO); Takaoka-gun, Ochi-cho, Mt. Yokogura, *H. Koyama 4253* (KYO); Takaoka-gun, Hidakamura, Ejiri, *N. Kurosaki 6665* (KYO); NE of Kochi-city, Ohsaka-goe, *H. Koyama 4225* (KYO); Mt. Godai, Koidzumi, *Geniti s.n.* (KYO); Kami-gun, Tosayamada-cho, *N. Kurosaki 6271* (KYO), *6689* (KYO); Kami-gun, Monobe-mura, Mt. Kanjyo, *G. Murata et al. 223* (KYO); Kami-gun, Togayamada-cho, *N. Naruhashi 1300* (P); Kannoura, *M. Togashi 1644* (PE); Aki-gun, Adamichi, Mt. Kamine, *M. Tagawa 1336* (KYO). Pref. Tokushima: Naka-gun, *S. Murai s.n.* (KYO); Miyoshi-gun, Nishiiyayama-mura, Mt. Kunimi, *G. Murata 7685* (KYO); Miyoshi-gun, Ikedatyou, *S. Tsugaru 1282* (KYO); Mima-gun, Wakimachi, *Y. Kato 46* (KYO); Mima-gun, Anabuki-cho, Ogami-mura, *N. Kurosaki 8156* (KYO). KOREA. Isl. Jeju, s. loc., *K. Katakura s.n.* (KYO); Isl. Jeju, Mt. Hanja, *Park s.n.* (KYO), *I. Nakashima s.n.* (KYO).

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