**H. tsushimensis** Fujita 1976

*H. tsushimensis* N.Fujita f. *albiflora* (S.Toyama) N.Fujita


ツシマギボウシ = 対馬擬宝珠 = Tsushima Gibōshi
シロバナツシマギボウシ = *H. tsushimensis* f. *albiflora* = Shirobana Tsushima Gibōshi

**History & Nomenclature:**

In Japan this species is called *Tsushima Gibōshi*, the “hosta from Tsushima,” (Tsushima Island). In 1976, the ecologist N. Fujita described *H. tsushimensis* from populations found in various locations on both of the large Tsushima Islands. Its main habit is located on Tsushima-shichō (対馬支庁) on Mount Izuhara (厳原) and on Shimonomushima (下島), on Mount Ariakeyama (有明山). M.G. Chung located colonies on Mount Izuhara and he considered only material collected on Tsushima Island in his 1990 study. This makes it difficult to correlate it to two other related taxa: *H. jonesii* and *H. tibae*. Fujita and Tamura (2008) considered *H. tibae* a variety of *H. tsushimensis*.

**Habitat and Biology:**

The habitat of this species is located in the Tsushima Strait (対馬海峡 = Tsushima Kaikyō), which is the eastern channel of the Korea Strait. The Tsushima Strait lies between Korea and Japan, connecting the Sea of Japan (East Sea) and the East China Sea. The two main islands are called Kami (north) and Shimo (south) and there are many small islands, all considered part of

*H. tsushimensis* N. Fujita (cult. voucher)
Nagasaki-ken (長崎県); Tsushima-shichō (対馬支庁); Izuhara (厳原);
Vouch.: Chung 1614
Nagasaki-ken (長崎県). *H. tsushimensis* grows in various locations on the main islands. This includes dry, higher elevations wooded areas and under shrubs. Other populations are found in bottom land, which contains more moisture, near streams or near the coast. This species is very polymorphic and many different leaf shapes can be found from narrow-lanceolate to about ovate. Some have straight margins, others have wavy edges. A number of variegated mutants found in the wild have been selected and named. As with *H. jonesii* and *H. tibae*, *H. tsushimensis* also develop branching racemes in some populations. Its flowers are lighter in color and whitish purple on the outside of the perianth. It is similar to *H. tardiva* but differs by its later later flowering time.

*H. tsushimensis* (cult. voucher)
Ariake-yama (有明山); Shimono-shima (下島)
NA Voucher 45167
Hosta Hill R.G. © W.G. Schmid 1989.04.17
its wider, more glossy and cordate leaves with smooth veins underneath, and its good fertility. A white-flowered form is known as *H. tsushimensis* f. *albiflora* (S. Toyama) Yonek., comb. nov. It is rare in the wild habitat. J. Jap. Bot., 80:6 (2005). *H. tsushimensis*, *H. jonesii*, and *H. tibae* form a closely related group but Chung (1990) did not include the latter in his studies. Ohba, et. al., (1987) suggest *H. tsushimensis* migrated from Korea to Tsushima Island and Kyushu, Japan, during the Pleistocene and speciated on the island together with other glacial remnants. My studies show, it is also possible that the reverse took
place and that \textit{H. jonesii} and \textit{H. tsushimensis} originated with the ancestral populations of \textit{H. tibae} in the northwestern Kyushu habitat. Chung (1990) argues that \textit{H. tsushimensis} and \textit{H. jonesii} may have developed from elements of \textit{H. minor}, separated by the last glacial event but it seems more likely that the propagule was a species from Japan, based on RAPD analysis (banding patterns) and distribution patterns. \textit{H. tsushimensis} and \textit{H. jonesii} are morphologically much closer to the Japanese populations than the highly differentiated native Korean species: \textit{H. yingeri}, \textit{H. laevigata}, \textit{H. clausa}, \textit{H. minor}, \textit{H. venusta} and \textit{H. capitata}. Although scape branching has been observed in many species, it is not a consistent trait but the natural populations of \textit{H. jonesii}, \textit{H. tsushimensis} and \textit{H. tibae} include many clones exhibiting consistent branching of the scapes which may be an evolutionary response to a lack of compatible pollinators in a windswept insular and coastal environment. Specimens (in L) collected by von Siebold in 1827 also show this branching (in \textit{H. tibae}) [see Species Update; \textit{H. tibae}, pages 4 and 5]. These species are related and form a group, which has its largest representation on Kyushu.

**Plant Morphology:** Plant size 45 cm dia. by 20 cm high (18 by 8 in.). Petiole 17.5–25 cm by 6–8 cm wide (7–18 by 0.25–0.35 in. wide), slightly winged, erect, green, with purple dots. Leaf 15–22.5 cm by 7.5–12.5 cm wide (6–9 by 3–5 in.), erect, ovate to ovate-cordate, tip acuminate, slightly undulate, wavy in the margin, smooth, light green above, glossy lighter green below. Venation 5–9, sunken above, projected, smooth below. Scape 65–90 cm long (26–30 in.), erect, obliquely ascending, lax, green, purplish red dotted. Sterile bracts, 2–3, clasping the stem; fertile bracts, navicular, long, thick, grooved, whitish-green, persisting, not withering at anthesis. Raceme 25–30 cm (10–12 in.), loosely arranged, to 30 flowers, frequently branching. Flowers 4–5 cm long and 4 cm broad (1.5–2 by 1.50 in.), translucent lines end at center, whitish to purple outside, inner nerves purple, tepals color: ▲▲ (Type B in W.G. Schmid;
1991) perianth expanding, funnel-shaped, lobes spreading acutely; pedicels to 1.5 cm (0.5 in.) white, purple-dotted, stamens projecting greatly beyond perianth. Anthers whitish posterior, sparsely purple dotted. Late August/September. Fertile.

Karyotype-Chromosomes: Sporophytic Count = 60; 12 large, 48 small; (2n).

Pollen: (Pollen shape after Erdtman, 1966): *H. tsushimensis* = Subtype RG(IIA) (rugulate granulate): OS (oblate-spheroidal); size P 69.0 ± 1.9 × E 64.3 ± 2.4 (Sizes given in μm ±2–10% polar axis (P) × equatorial axis (E)). As typified by M.G. Chung and S.B. Jones, 1989;

Genome Size: DNA content (2C) in pg (one (10⁻¹²) gram) = 17.3 ± 0.12. (Zonneveld, B.J.M. and F. Van Iren (2001); with other data included, this value indicates close relationship with *H. jonesii*, the latter having a pg of 17.5 ± 0.09)

DNA Banding: Recent RAPD analysis (Y. Yu, 2002; Sauve, R.J., S. Zhou, Y. Yu, and W.G. Schmid. 2005). In additions to other taxa, the banding patterns of 4 related species accessions (See Fig. B) were compared in the 2002/2005 study. The 4 species shown in the banding pattern were compared using a single primer OPB-01 (5'-GTTTCGCTCC-3'), generated three bands as shown in Fig. B. The polymorphic band (850bp) common to (36) *H. tardiva*, (39) *H. takahashii*, (40) *H. tibae* allowed for the separation of (41) *H. tsushimensis* from the group. The second band (937bp), which was common to (36) *H. tardiva* and (40) *H. tibae* allowed for their separation from (39) *H. takahashii*. The third band (676bp) allowed for the separation of (40) *H. tibae* from (36) *H. tardiva*. Separation of *H. tsushimensis* from this group is an indication that this species is closer related to *H. jonesii* (confirmed by DNA content).
**H. tsushimensis Holotype**

Ariake-yama (有明山); Shimono-shima (下島); Tsushima-shichō (対馬支庁)
Nagasaki-ken (長崎県); Kyūshū (九州)
Holotyp. KYO No. 3037. Kyoto Univ. Herbarium ♦ 京都大学総合博物館
H. tsushimensis Isotype (01218)
Isotypus: TNS 249544 (F. 301); H. Koyama #3037; 1969.08.22.
Coll. loc. cit.: Ariake-yama (有明山); Shimono-shima (下島); Tsushima-shichō (対馬支庁); Nagasaki-ken (長崎県); Kyūshū (九州).
**Taxonomic Type and Synonymy:**

*H. tsushimensis* Fujita.


Type: Holotype in KYO, No. 3037. Loc cit. coll.: H. Koyama, Ariake-yama (有明山); Shimono-shima (下島), Tsushima-shichō (対馬支庁), Nagasaki-ken (長崎県); Kyūshū (九州); (see page 7). Isotype in TNS 249544, H. Koyama (page 8).

Hab.: Insular climate habitat includes dry, higher elevations wooded areas and under sub-shrubs; also bottom land containing more moisture on Tsushima-shichō (対馬支庁), Nagasaki-ken (長崎県); Kyūshū (九州);


Type: S. Toyama, 1932.09.06 Herb. Biol. Inst., Fac. Lib. Arts, Nagasaki Univ. Nagasaki; loc cit. coll.: Ariake-yama (有明山); Shimono-shima (下島), Tsushima-shichō (対馬支庁), Nagasaki-ken (長崎県); Kyūshū (九州);

Hab.: Insular climate habitat includes dry, higher elevations wooded areas and under sub-shrubs; also bottom land containing more moisture on Tsushima-shichō (対馬支庁), Nagasaki-ken (長崎県); Kyūshū (九州);

**Japanese Language Synonyms:**

ツシマギボウシ = Tsushima Gibōshi = *H. tsushimensis*
シロバナツシマギボウシ = Shirobana
Tsushima Gibōshi = *H. tsushimensis* f. *albiflora*.

**Horticultural Names:**

*H. minor* incorrect
Tsushima Hosta

*H. tsushimensis* (cult. voucher) ★★★
Flower Detail (NA 45167)

Hosta Hill R.G. © W.G. Schmid

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**H. tsushimensis in Cultivation:**

This species is infrequently seen in gardens. There are a number of sports and variegated hybrids grown in gardens, but the species is not popular. There are a few plants sold that are incorrectly identified but most are the “true” species. As seen in the in situ photograph on page 3, in cultivation this species is more vigorous in growth and is an attractive horticultural subject. Of high garden interest are the branched scapes seen in some of the cultivated clones. Branched scapes are also observed in *H. tibae*, which grows in Nagasaki Prefecture directly across the Korea Strait and Tsushima Island located in the strait and in *H. jonesii* endemic to islands on the southern coast of Korea. The branched scapes lend an unusual look to scape elongation and while the species is in flower. Whether branched or not branched, the garden worthiness of this species lies not in its foliage, but rather in its flowers. In August, numerous scapes rise from the leaf crown and each scape is loaded with dozens of purple, white striped outside, and purple striped inside, funnel-shaped flowers.
Hosta Hill R.G.
© W.G. Schmid 1989.08.22

H. tsushimensis (cult. voucher)
(NA Voucher 45167)

▲
Detail of bud initial

►
Elongating scape/raceme w/ bud initials

H. tsushimensis
Detail of bud initial ►

Court.: © yahoo.co.jp-giboushiblog
*H. tsushimensis* f. *albiflora*
(in situ) ►►►
Ariake-yama (有明山)
Shimono-shima (下島)
In dry area along road
flowers white
Court. : © 対馬植物図鑑

*H. tsushimensis* (cult. voucher)
NA Voucher 45167
Under cultivated conditions, the scapes become longer than those found in situ.
Compare in situ photograph on page 4

Hosta Hill R.G. © W.G. Schmid
1989.09.07
H. tsushimensis (cult.)
Research specimen (Court.: © yahoo.co.jp-giboushiblog)
The lighter color is attributed to shade location

H. tsushimensis (in situ Ariake-yama (有明山), Shimono-shima (下島), Tsushima-shichō (対馬支庁)
In damp area near stream.
Flower color is darker

This may be:
三色ツシマギボウシ
= H. ‘Sanshoku Tsushima’
Court. © 対馬植物図鑑
Named Japanese Sports or Variants: *H. ‘Ogon Tsushima’* is the correct cultivar name is a yellow form found in cultivation and possibly in the wild. The Japanese named it 黄金ツシマギボウシ = Ogon Tsushima Giboshi. It retains its bright yellow color. By some called *H. tsushimensis* ‘Golden’ or *H. tsushimensis* ‘Ogon’. Both of these names are incorrect because their formulation goes against the rules of the International Code of Nomenclature for Cultivated Plants (ICNCP).

*H. ‘Ogon Tsushima’*
(黄金ツシマギボウシ)
Ogon Tsushima Giboshi
Photo © B. Skaggs
Hosta Library

*H. ‘Sanshoku Tsushima’* is reportedly a mutation found in the wild with tri-colored flowers, dark crimson at the base of the narrow tube, and purple on the petals and has large white transparent lines. It does not come true from seed so is considered a cultivar (*H. takahashii* has a similar morph, which see). The Japanese named it 三色ツシマギボウシ = Sanshoku Tsushima Giboshi. *H. tsushimensis* ‘Sanshoku Tsushima’ hort. is an incorrect cultivar name and against the rules of the International Code of Nomenclature for Cultivated Plants (ICNCP).

*H. tsushimensis* ‘Albiflora’ (the botanical name is *H. tsushimensis* f. *albiflora*) is the white-flowered form of *H. tsushimensis* and its valid botanical name was published in 2005 as *H. tsushimensis* f. *albiflora* (S. Toyama) K. Yonekura, comb. nov. (J. Jap. Bot. 80:6 (2005). In Japan and before this, it was called 白花ツシマギボウシ = Shirobana Tsushima Giboshi (= white-flowered Tsushima hosta). This form is rarely found in the wild and reportedly does not come true from seed, although I was not able to confirm that source. Notwithstanding, if *H. tsushimensis* f. *albiflora* is considered a cultivar under the ICNCP, its name must to be *H. tsushimensis* ‘Albiflora’ per ICNCP Chapter V, §2. 19.6, which requires that the former correct name of the taxon be retained as the cultivar epithet (in the event the taxonomic unit is reclassified as a cultivar). The following are incorrect names used: *H. ‘Shirobana Tsushima’, H. tsushimensis ‘Shirobana Tsushima’, and H. tsushimensis ‘Shirobana’.

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**H. tsushimensis** (cult. Voucher)
NA Voucher 45167

Hosta Hill R.G.
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1989.09. 21

Three-locular seed capsules ►
Here on unbranched scape/racemes

Three-locular seed capsules ►
Here on branched scape/racemes

◄◄ **H. ‘P. M. Stripe’**

*H. tsushimensis*
‘P.M. Stripe’
Photo ©C. Brashear
Hosta Library

Darker green veining on lighter green leaf
Horticultural Progeny:
Note: The true *H. tsushimensis* is not frequently seen in gardens. 2 cultivars have been listed, which involve a yellow sport of this species as a pod (♀ *H. tsushimensis*) parent or pollen (see below). There are several sports in cultivation.

References:
Davidson, R., 1990. Letter dated January 1990 sent to Dr. R. C. Olson (Private Comm.)
Maekawa, F. 1940. The genus Hosta. J. of the Faculty of Science, Imperial University Tokyo, Section 3 Botany, Vol. 5:317–425.


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