**Hosta Species Update**

**H. plantaginea var. japonica** Kikuchi et Maekawa 1940


玉簪 = タマノカンザシ = tama no kanzashi (Japanese; from the Chinese 玉簪)

**H. plantaginea f. stenantha** Maekawa 1940

**H. plantaginea ‘Stenantha’** Schmid 1991 (ex Maekawa)

*J. of the Fac. of Science, Sect. 3 Botany, Vol. 5:347, ic. 9


クダザキマルバタマノカンザシ = kudazaki maruba tama no kanzashi (Japanese; Maekawa 1940; forma nov.)

긴옥잠화 = Gin-ok-jam-hwa (Korean name)

옥잠화 = Ok-jam-hwa (Korean name; alias)

비녀옥잠화 = Bi-nyeo-ok-jam-hwa (Korean name; alias)

**Introduction to Nomenclature:** The two listed sub-specific taxa of *H. plantaginea* are by some authorities considered phenotypical variants of the species. *Flora of China* (2000; Vol. 24:204, 205 (中國植物誌 – Chinese Edition) does not recognize either of the Japanese forms established by A. Kikuchi and F. Maekawa (1934, 1940) as *H. plantaginea* var. *japonica* and *H. plantaginea* f. *stenantha*. Maekawa (1969) no longer included the latter (*H. plantaginea* f. *stenantha*) and W.G. Schmid (1991) reduced it to cultivar status as *H. plantaginea* ‘Stenantha’. *H. plantaginea* var. *japonica* is still recognized as a taxon in some references, but recent research indicates that it is a phenotypical variant of the species. As to whether this taxon should be maintained as a *varietas* separately from the typical species is undecided. In this *Species Update* it is listed as the variety, because it has horticultural features, which make it distinguishable for horticultural applications. Maekawa (1940) published several photographs, which show the small morphological differences that differentiate the various forms. Maekawa No. 6 shows *H. plantaginea* (typical form) left and *H. plantaginea* var. *japonica* right. The typical form has larger, more rounded leaves (not a good indicator) and has fewer flowers on each inflorescence. The leaves of the typical form appear flatter, while those of the variety are more elongated and wavy. The best morphological indicator is the shape of the perianth:

1) *H. plantaginea* forma typica (Maekawa Photo No. 8) has a long narrow tube (tubus angustus = TA) followed by an expanding perianth tube (tubus dilatatus = TD) that is slightly bell-shaped (starting at TA) and has broad tepals that are shorter than those of *H. plantaginea* var. *japonica* and *H. plantaginea* f. *stenantha*.

2) *H. plantaginea* f. *stenantha* (Maekawa Photo No. 9) has a long narrow tube (tubus angustus = TA) that is thinner and slightly longer than that of *H. plantaginea* forma typical, followed by an expanding perianth tube (tubus dilatatus = TD) that is not expanded, bell-shaped (starting at TA) but expanding, trumpet shaped and has tepals that are narrower and more separated than those of *H. plantaginea*.
3) *H. plantaginea* var. *japonica* (Maekawa Photos No. 6 and 12) has a perianth that is morphologically similar to *H. plantaginea* f. *stenantha* but has a larger and longer TA with the TD flaring, trumpet-shaped and longer exterior lobes (EL).

It is important to note that such minor differences may not justify to separate these forms taxonomically. As pointed out earlier, Maekawa (1969) no longer included *H. plantaginea* f. *stenantha* and Schmid (1991) reduced it to cultivar status. Having observed all of the different forms of this species it can be said that separating them visually is difficult even to those trained in morphological observation. The separation of *H. plantaginea* forma typical and *H. plantaginea* var. *japonica* has valid horticultural justification and the latter has been maintained as a variety. Also important is the consideration of specimens imported into Europe in the late 1700s and to about 1850. Some of these imports also show slight differences that will be discussed in *History and Nomenclature*. 

Maekawa Photo No. 6

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History and Nomenclature:
The imported European forms of Hosta plantaginea arrived from China and Japan long before they were taxonomically recognized by Kikuchi and Maekawa (1934, 1940). The history of the typical species is detailed in Species Update in the separate section for H. plantaginea. Aside from the typical species, other forms were also brought to Europe. In the late 1820s, von Siebold obtained a sample of H. plantaginea var. japonica while stationed at Deshima (出島 protruding island; an artificial island which was site of the Dutch settlement in Nagasaki Harbor). In 1830, by way of returning to Holland, he deposited this live sample at Batavia's Buitenzorg gardens where it was planted (Schmid 1991). According to Hensen (1963), in 1841 J. Pierot of the Rijkskerbarium Leiden (L) stopped over in Batavia, Java, retrieved H. plantaginea var. japonica and sent it to von Siebold in Leiden under the name Funkia grandiflora. First listed by von Siebold (1844) as Funkia grandiflora and as Funkia subcordata grandiflora in 1856, it probably is probably an adaptive form of the original specimens received in Japan in the early 1800s. As pointed out earlier, the “Japanese Plantaginea” differs from the Chinese species by having longer and narrower leaf blades and making Funkia grandiflora Siebold (in scheda 1844)
S2355 in MAK (Makino Herbarium; U. of Tokyo; 東京都立大学牧野標本館)
Det. H. plantaginea var. japonica; H. Kato;
a taller, a less compact leaf differs from the Chinese species by having longer and narrower leaf blades and making a taller, a less compact leaf mound; by the anthers being yellow with slight purple dotting; and by the lobes of *H. plantaginea* var. *japonica*, more narrow and straight looking and less recurving. The dried specimen (page 3) verifies this was *H. plantaginea* var. *japonica*. This plant has been cultivated in Europe since von Siebold introduced it and part of its original name, i.e., “Grandiflora,” (as in *H. plantaginea* ‘Grandiflora’) is in use to this very day. This cultivar is also sold in other European countries under the name *H. plantaginea*. Hylander (1954) stated: “There is still some uncertainty as to the nomenclature of a slightly aberrant form also represented in European gardens *H. plantaginea* var. *grandiflora*. This plant has all of the morphological traits of *H. plantaginea* var. *japonica* and is here considered as originating with von Siebold’s collection in Japan. Siebold’s “Japanese Plantaginea” has been cultivated in Japan for a very long time. First mentioned by the Japanese scholar Ranzan Ono (小野蘭山) in *Botanical classification* (本草綱目啓蒙; 1802/1803). Now, it is considered *H. plantaginea* var. *japonica*. In 1940, Maekawa confirmed the native Chinese species with rounded leaves and larger flowers was introduced into Japan from Europe relatively recently, with no exact date given. Maekawa’s revelation establishes that the plants Ranzan Ono described was *H. plantaginea* var. *japonica* (タマノカンザシ = tama no kanzashi (fide Ranzan Ono ex Maekawa 1940)). *H. plantaginea* f. *stenantha* (キダザキタマノ-カンザシ = kudazaki tama no kanzashi (ex Maekawa 1940)) was an attempt to differentiate another Japanese form from the classic Chinese *H. plantaginea*. *H. plantaginea* f. *stenantha* is rarely seen in gardens and is not available in horticulture. This may be just as well, because it is by no means as fragrant and as attractive as the other forms of *H. plantaginea*. Second in splendor and popularity to the typical species, *H. plantaginea* var. *japonica* is available and cultivated in many gardens the world over.
Plant Morphology: Macromorphologically, *H. plantaginea* var. *japonica* is very similar to the typical form of *H. plantaginea*. It also develops the large flowers and occasionally, its flowers are measurably larger, particularly longer at a ratio of 1.1 to 1.0. The Japanese form is also noticeably fragrant and night-blooming. The best time to observe the large flowers and notice the fragrance is during evening hours. The unstable floral architecture observed in the *H. plantaginea* form typica has not been reported in *H. plantaginea* var. *japonica* nor in *H. plantaginea* f. *stenantha* (= *H. plantaginea* ‘Stenantha’). A con-version and multiplication of floral organs occurring in *H. plantaginea* form typica was described and named by Maekawa (1940; page 347), as *H. plantaginea* f. *Aphrodite* and is now considered a cultivar as *H. ‘Aphrodite’*; reduced by W.G. Schmid 1991; page 85). For further information and scientific references see the dis-cussion in separate section of Species Update under *H. plantaginea* [forma typica]). For *H. plantaginea* var. *japonica* specifically, floral conversion has not been scientifically described. Also, this has not been observed at Hosta Hill R.G. and other cultivated locations. In Japan, plants of *H. plantaginea* var. *japonica* are sometimes erroneously sold as “large, double flowered” (= 八重咲きの大輪). The fact that it blooms with 6 normal tepals, showing no floral con-version, has raised complaints in horticultural circles (per yurikago1exblog (ゆりかごのつぶやき)).

**Plant size** 65 cm dia. by 45 cm high (26 by 18 in.). Petiole 24 cm by 0.9 cm wide (10 by 0.35 in. wide) erect and spreading, unmarked glossy light green. Leaf 20–28 cm by 14–20 cm wide (8–11 by 5.5–8 in.), erect but more relaxed than the type and in line with petiole, becoming subpendul-ous, orbicular-cordate, nearly round, transition tight and contracted to slightly open, in-terior surface ``flat'', but un-
dulate, wavy in the margin, not pruinose, surface shiny above, below very glossy, light yellow green, small cuspidate, tip acuminate. Venation 8–9, sunken above, very projected, smooth below. Scape 60–80 cm long (24–32 in.), straight, erect, yellow-green, smooth round. Fertile bracts, 2-bracted, bracteole within external bract, opposite to lower fertile bracts, flat, large to 9 cm (3.50 in.), fleshy and rigid, green or greenish white; glossy or glossy green, ovate-lanceolate, grooved in the lower part, pointed; lower sterile bracts often foliaceous. Raceme 25 cm (10 in.), 10–15 flowers. Flowers degeneratively duplicate, with one-flowered, sessile branches, appearing racemose, held erect in ±horizontal position on strong pedicels, fragrant, very large, to 13.5 cm (5.50 in.) long and 7.5 cm (3 in.) broad, waxy, shiny, long tubular, grooved TA with expanding lily-shaped tepals with recurving exterior lobes (EL); see photos pages 5 and 6; shiny white entirely, occasionally shades of white and pale cream, stamens not superior, parallel, joined to perianth tube. August, night-flowering. Anthers yellow, with light purple dotting. Considered sterile by some, but actually a late-season fertile taxon (see the following explanation):

Fertility in *H. plantaginea* var. *japonica*. In 1939, Kono Yasui (保井コノ - the first woman Doctor of Science in Japan) published an empirical study dealing with the (sometimes) problematic fertility experienced in *H. plantaginea* and its varietal form *H. plantaginea* var. *japonica*. A University of Tokyo voucher of *H. plantaginea* (forma typica) was 1) self-pollinated, and 2) pollinated with the pollen of *H. plantaginea* var. *japonica*. Self-pollinated flowers of the typical species produced pods with a calculated ratio of fertile to sterile seeds (aborted ovules) of 1:3. The typical species when pollinated with the pollen of *H. plantaginea* var. *japonica* produced a higher percentage of fertile seeds and the calculated ratio of fertile to sterile seeds (aborted ovules) was 1:1. Yasui determined that *H. plantaginea* (forma typica) is a monogenic heterozygous plant of *L* and *l*; *L* symbolizes a dominant lethal gene causing the partial sterility in this plant, and *l* is its allele, which is a recessive gene. The combinations *LL* and *Ll* cause the abortion of the embryo and *ll* produces a fertile embryo. The gene *L* does not affect any gametes. On the other hand, *H. plantaginea* var. *japonica* is sometimes considered self-sterile but is actually a later season fertile plant that requires a long season to produce viable seed. *H. plantaginea* var. *japonica* produces viable seed. This is due to the lethal *L* gene being absent in its genetic makeup. Thus, the ratio of viable to aborted ovules is 1:1.
**Karyotype-Chromosomes:** Sporophytic Count = 60; 12 large and 48 small; diploid (2n); (Mehra, P.N. & T.K. Pandita; *Taxon* 28:405 1979).

**Genome Size:** Determination of DNA content depends on correct identification of the taxa being examined. Below are the author’s interpretations of the names listed in Zonneveld (2001). Tested were 5 identified specimens and DNA content measured to be as follows (2C) in pg (10⁻¹² gram):

- *H. plantaginea* (forma typica) 24.8 (= *H. plantaginea*)
- *H. plantaginea* ‘Aphrodite’ 24.4 (= *H. plantaginea* conversion)
- *H. plantaginea* ‘Richland Yae’ 24.4 (= *H. plantaginea* conversion)
- *H. plantaginea* ‘Grandiflora’ 24.9 (= *H. plantaginea* var. *japonica*)
- *H. plantaginea* ‘Yu Lei’ 24.9 (= *H. plantaginea* var. *japonica*)

These data indicate that no measurable difference exists in the DNA content between *H. plantaginea* (forma typica) and *H. plantaginea* var. *japonica*, indicating a close relationship. Minor differentiation in morphological characters between these taxa may be due to local adaptations over long periods and due to different ecologies. Two cultivars with floral conversion were tested and found to have the same DNA (2.4 pg) content, which is less than the species. The latter may be due to conversion factors, but that has not been determined. It firms that *H. ‘Aphrodite’* and *H. ‘Richland Yae’* have the same origin. *H. ‘Venus’* has not been tested so its relationship can not be determined. Also not tested was *H. plantaginea* var. *stenantha*, which is in this *Species Update* considered a selected cultivar of *H. plantaginea* var. *japonica*, namely *H. plantaginea* ‘Stenantha’ so not of taxonomic importance (Maekawa 1969; Schmid 1991).

**Pollen:** Palynological data (M.G. Chung and S.B. Jones; 1989; Pollen shape after Erdtman, 1966) confirm correlations with the taxonomic treatment in F. Maekawa (1940) and W.G. Schmid (1991) in Subgenus *Hosta* (= formerly Subgenus *Niobe*). Pollen morphology supports subgeneric and sectional separation in Schmid (1991). The cited reference indicates *H. plantaginea* has reticulate exine ornamentation with semitectate-columellate wall structure, while all the other species of *Hosta* have a more or less continuous variation in the exine ornamentation, from rugulate through rugulate-baculate to rugulate-granulate exine ornamentation with mostly aetate wall architecture. Three specimens were tested. There was no difference in the pollen type in the three, and all had pollen type R (reticulate). It is

▲ *H. plantaginea* var. *japonica*

Pollen Type R (reticulate)
Proximal Polar View of Whole Grain
SEM × 650 (M.G. Chung)
For Additional Illustrations See *H. plantaginea* in this *Species Update*
important to note that two of the specimens had a similar pollen grain size, one had a larger pollen grain size:

- Chung 227 (GA): Polar 105.8 ± 7.4 to Equatorial 90.4 ± 5.4.
- Bailey s.n. (BH): Polar 105.3 ± 7.6 to Equatorial 96.4 ± 5.6.
- Chung 234 (GA): Polar 121.0 ± 3.9 to Equatorial 112.0 ± 4.3.

The Bailey specimen is determined to be *H. plantaginea* var. *japonica* and together with Chung 227 gives a range size range for the variety. Chung 234 has been observed by the author as being *H. plantaginea* (forma typica) and has a larger pollen grain. (See the section on *H. plantaginea* in *Species Update* for additional details).

**DNA Banding:** Cluster analysis of RAPD analysis (Y. Yu, 2002; Sauve, R.J., S. Zhou, Y. Yu, and W.G. Schmid. 2005) has confirmed the genotypical differentiation of *H. plantaginea* (F. Maekawa 1940; in Comparison of the banding patterns and cluster analysis supports the unique taxonomic position of *H. plantaginea* as the type species of the genus *Hosta* and its placement in the monotypic subgenus *Hosta*. *H. plantaginea* var. *japonica* has not been included in this cluster analysis. Macromorphology, genome size and palynology (as detailed above) show that these taxa are closely related and linked taxonomically.

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*H. plantaginea* var. *japonica*
Typical Slender Inflorescences and Flowers
Court.: © Tomobee’s Photolife

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Taxonomic Type and Synonymy:
H. plantaginea var. japonica Kikuchi ex Maekawa.
J. of the Faculty of Science, Imperial University Tokyo, Section 3 Botany, Vol. 5:343, 344, 348; ic. 6, 12; 1940.

Botanical Synonyms:

Japanese Synonyms:
マノカンザシ = tama no kanzashi (Japanese; Ranzan Ono (小野蘭山) and Maekawa)

Horticultural Synonyms:
Fragrant Plantain Lily. (in part)
Funkia grandiflora hort. (in part)
Funkia liliiflora Foerster 1956 incorrect.
Funkia subcordata grandiflora hort. (in part)
Hosta ‘Grandiflora’ incorrect.

Japanese Synonyms:
긴옥잠화 = Gin-ok-jam-hwa (Korean synonym; Gin means “long” and is derived from the elongated buds and flowers)

Horticultural Names:
H. plantaginée ‘Japonica’ hort. (incorrect).
H. plantaginea subcordata grandiflora hort. (in part)

Narrow Fragrant Plantain Lily.
Japanese White Plantain Lily.
Narrow-leaf White Plantain Lily.

H. plantaginea f. stenantha
Showing Linear-Oblong Tepals-Short Style
Court.: ©iroha.s7.xrea

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**H. plantaginea f. stenantha** Maekawa 1940

**H. plantaginea** ‘Stenantha’ Schmid 1991 (ex Maekawa)

*J. of the Fac. of Science, Sect. 3 Botany, Vol. 5:347, ic. 9*


クダザキマルバタマノカンザシ = kudazaki maruba tama no kanzashi (Japanese; Maekawa 1940; forma nov.)

긴육잠화 = Gin-ok-jam-hwa (Korean name)

Introduction, History, Nomenclature and Morphology: This phenotype is a natural modification of the *H. plantaginea* var. *japonica* and was established by Maekawa (1940). The species epithet *stenantha* points to its minor morphological differentiation and is derived from Greek *stenos* = narrow and *anthos* = flower. Its Japanese vernacular name is *kudazaki maruba tamano kanzashi* (= クダザキマルバタマノカンザシ = “narrow-flowered, round-leaved leaf jewel of the ornamental hairpiece” = narrow-flowered hosta). Reported by Kikuchi and based on a (probably cultivated) specimen cultivated in Hortus Kikuchi No. 322 (pro parte). This specimen was obtained in Hebei province (河北), near the city of Paoting (ex Kikuchi), now called Baoding (保定; Pinyin: Bǎodìng), which is located close to and south of Beijing. This phenotypical form is rarely seen but can occasionally be observed among cultivated specimens of *H. plantaginea* var. *japonica* (see flower details Maekawa’s photo No. 9; page 2 and page 9). It differs by having taller scapes and in the shape of the perianth, which is more narrow in appearance and the tepals are slimmer and linear-oblong and spaced apart. The TA is shorter. The stamens project slightly beyond the perianth and the style projects no further than the stamens. This phenotype is here considered a natural modification. Schmid (1991) considered it not sufficiently differentiated to be maintained as a separate taxon so reduced it to cultivar form as *H. plantaginea* ‘Stenantha’ or simply *H.* ‘Stenantha’. It has yellow anther with slight purple suffusion, so may be a hybridized form but lacking vouchedered specimens, this has not been scientifically established. This form is no longer of taxonomic importance so its treatment here is held to a minimum.

**Taxonomic Type and Synonymy:**

*H. plantaginea f. stenantha* Maekawa

*J. of the Faculty of Science, Imperial University Tokyo, Section 3 Botany, Vol. 5:347, ic. 7, 9; 1940 (reduced to cultivar form).*

*H. plantaginea* ‘Stenantha’ (a cultivar form Schmid 1991; alt. = *H.* ‘Stenantha’)

*The genus Hosta: Ghiboshi Zoku* (ギボウシ属); Timber Press; Portland. P. 85.

**Japanese Synonyms:**

クダザキマルバタマノカンザシ = kudazaki maruba tama no kanzashi (Japanese; Maekawa 1940).

**Korean Synonyms:**

옥잠화 = Ok-jam-hwa (Korean synonym; this taxon/cultivar is considered in KPNI synonymous to *H. plantaginea* and carries the typical species name).
**Horticultural Synonyms:**

_H. plantaginea_ ‘Stenantha’ hort.
Narrow-flowered White Plantain

_H. plantaginea f. stenantha = H. ‘Stenantha’_
A Photograph by Maekawa (1940; Photo. 7; p. 343) Shows H. ‘Stenantha’ in Center

**References:**


KPNI 2004 (무표준식물목록 – Korean Edition)


Maekawa, F., 1940. *J. of the Fac. of Science*, Sect. 3 Bot., Vol. 5:347-349, ic. 6-7, 9, 12.


Ranzan, Ono (小野蘭山) 1802/1803. *Botanical classification* (本草綱目啓蒙).
Ranzan, Ono (小野蘭山) 1847 (Rev. and Ampl. Ed. of (Botanical classification (本草綱目啓蒙)).


Shirai and Oonuma in Iwasaki: Honzo-Dzufu, Ed. 2/20, folio 13/14 1921


**H. plantaginea var. japonica and H. plantaginea ‘Stenantha’ in Cultivation:**
The Japanese H. plantaginea has been in cultivation the world over. Its importation by von Siebold came after the typical species from China had been distributed all over Europe and North America. The Japanese form makes an attractive garden plant, but in no way does it approach the beauty of the typical Chinese species. Many gardeners the world over, particularly the Japanese, are seeking out the Chinese species and have converted some of their rice fields to the propagation of this beautiful hosta species (see page 23 of the section on H. plantaginea forma typica). H. plantaginea ‘Stenantha’ is rarely seen in cultivation.
**H. plantaginea var. japonica**

Court.: © Kyōto Botanical Garden (京都府立植物園; Kyōto Furitsu Shokubutsuen) (pictures on page 12 and 13 are KBG)
**H. plantaginea var. japonica** (with seed pods)

Loc. cit.: Seoul, Korea;
Hiroshima University - 広島大学 ©山崎 和男

**Note:**

Also refer to the separate section on

**H. plantaginea var. plantaginea**

which includes additional comparative information

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