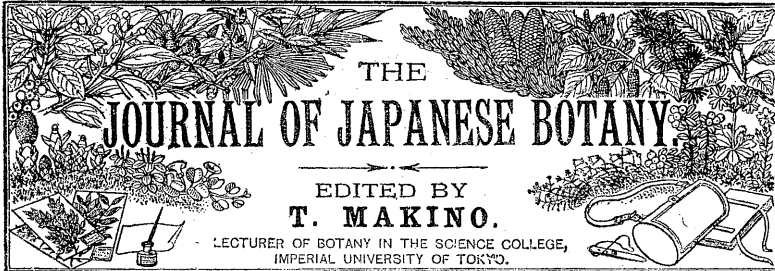


Published Monthly.

Subscription-price 8 s. = 8 M. = 2 dol. per annum, post free, for foreign countries.



Vol. I.

February 28, 1918.

No. II.

(NOVEMBER-1917 NUMBER.)

Published by the SHOKUBUTSU-KENKYŪ-ZASSHI-SHA.  
No. 3, Tosaki-machi, Koishikawa-ku, Tōkyō, Japan.

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## A Contribution to the Knowledge of the Flora of Japan.

(Continued from p. 34.)

By

Tomitarō Makino.

### *Sagittaria trifolia* LINN.

Submersed leaves obscure or scarcely visible. Leaves variable in size and width. Petals entirely pure white.

#### *a. typica* MAKINO.

*Sagittaria trifolia* LINN. Sp. Pl. p. 993; HOUTT. Linn. Pf.-Syst. X. (1783), p. 213; LAM. Encycl. Bot. II. (1790), p. 504; WILLD. Sp. Pl. IV. (1805), p. 411.

*Sagittaria sagittata* THUNB. Fl. Jap. (1784), p. 242, excl. nom. *Sagittaria sagittifolia* LINN.

*Sagittaria sagittifolia* LOUR. Fl. Cochinch. (1790), p. 570, et ed. WILLD. (1793), p. 698; ROXB. Fl. Ind. III. (1832), p. 645; KURZ in Journ. Bot. XI. (1873), p. 193; FRANCH. ET SAV. Enum. Pl. Jap. II. (1879), p. 16; FRANCH. Pl. David. I. (1884), p. 314; MATSUM. Ind. Pl. Jap. II. 1 (1905), p. 31; MAKINO in IINUMA, Somoku-Dzusetsu, ed. 3, IV. 20 (1912), p. 30, tab. 28, non LINN.

*Sagittaria sagittifolia* HOOK. FIL. Fl. Brit. Ind. VI. p. 561 (1893);

C. H. WRIGHT in Journ. Linn. Soc. XXXVI. p. 190 (1903), pro parte, non LINN.

*Sagittaria sagittifolia* *a. diversifolia* MICHELI, Alismac. in A. DC. Monogr. Phanerog. III. (1881), p. 67, pro parte.

*Sagittaria hastata* DON, Prodr. Fl. Nepal. (1825), p. 22.

*Sagittaria Doniana* SWEET, Hort. Brit. ed. 1 (1827), p. 375.

*Sagittaria hermaphrodita* BUCH.-HAM. in WALL. Cat. n. 4991.

*Sagittaria sagittifolia* var. *β. subaequiloba* REGEL, Tent. Fl. Ussur. (1861), p. 140; MIQ. Prol. Fl. Jap. in Ann. Mus. Bot. Lugd. Batav. II. (1865-66), p. 138, et Cat. Mus. Bot. Lugd.-Batav. (1870), p. 103.

*Sagittaria sagittifolia* *b. angustifolia* SIEB. Synops. Pl. Oeconom. Jap. in Verh. Batav. Gen. XII. (1827), p. 17.

*Sagittaria hirundinacea* BLUME, Enum. Pl. Jav. I. (1830), p. 34; KUNTH, Enum. Pl. III. (1841), p. 158; HASSK. Cat. Pl. Hort. Bot. Bogor. (1844), p. 26, et Pl. Jav. Rar. (1848), p. 104; MIQ. Fl. Ind. Batav. III. 1 (1855), p. 243.

*Sagittaria sagittifolia* var. *leucopetala* MIQ. III. Arch. Ind. Fl. II. (1870), p. 49; BUCHEN. Alismat. in ENGL. Pf.-Reich. (1903), p. 48.

Leaves sagittate; lamina ovate, broadly ovate, or lanceolato-ovate, acute or obtuse at the apex; basal lobes longer than the lamina, ovate or ovato-lanceolate, manifestly acuminate. Tuber very small.

Nom. Jap. *Omodaka*, *Hana-guwai*.

*Hab.* JAPAN, wild, common.

**forma plena** MAKINO, nov. comb.

*Sagittaria sagittifolia* var. *plena* MAKINO in IINUMA, Somoku-Dzusetsu, ed. 3, IV. 20 (1912), p. 31.

*Sagittaria japonica* Hort. et *Sagittaria japonica* fl. pl. Hort.

Flower double.

Nom. Jap. *Yae-omodaka*.

*Hab.* JAPAN, cultivated, very rare.

**forma suitensis** MAKINO, nov.

Leaves sagittate; lamina angustato-ovate; basal lobes longer than the lamina, lanceolate, acuminate. Tuber about 1-2cm. across, globose or ellipsoid, skin caeruleous.

Nom. Jap. *Suita-guwai*, *Mame-guwai*, *Hakari-guwai*, *Ko-guwai*.

*Hab.* Prov. SETTSU, cultivated in Suita-mura.

Tubers are sold in market for food.

**forma longiloba** (TURCZ.) MAKINO, nov. comb.

*Sagittaria sagittifolia* var. *longiloba* TURCZ. Fl. Baic.-Dah. III. (1854), p. 57; REGEL, Tent. Fl. Ussur. (1861), p. 140; MIQ. Prol. Fl. Jap. in Ann. Mus. Bot. Lugd.-Batav. II. (1865-66), p. 138; DEBEAUX, Fl. Shangh. p. 60; MAKINO in Bot. Mag., Tokyo, IX. (1895), p. 314 (Jap.); MATSUM. Ind. Pl. Jap. II. 1 (1905), p. 31.

Leaves sagittate or subhastato-sagittate; lamina linear-lanceolate, acuminate; basal lobes longer than the lamina, lanceolato-linear or linear, manifestly acuminate.

Nom. Jap. *Hosoba-omodaka* (T. MAKINO).

*Hab.* JAPAN, not uncommon.

**forma subhastata** MAKINO, nov.

Robust. Leaves subhastate; lamina ovato-subulate or subulato-lanceolato, acuminate,  $1\frac{3}{4}$ – $4\frac{1}{2}$  cm. broad; basal lobes much divergent, longer than the lamina, lanceolate or linear-lanceolate, very acuminate, about 11–17 cm. long.

Nom. Jap. *Hatakari-omodaka* (nov. nom.).

Hab. JAPAN, not uncommon.

**forma heterophylla** MAKINO, nov.

Leaves dimorphous, sagittate; outer leaves much broader; lamina broadly ovate; basal lobes longer than the lamina, ovato-lanceolate, acuminate; inner leaves angustate; lamina linear-lanceolate; basal lobes longer than the lamina, linear or broadly linear.

Nom. Jap. *Adzuma-omodaka* (nov. nom.).

Hab. Prov. MUSASHI, Shimura.

**var.  $\beta$ . sinensis** (SIMS) MAKINO, nov. comb.

*Sagittaria sinensis* SIMS in Bot. Mag. tab. 1631 (1814); SPRENG. Syst. Veg. II. (1828), p. 633 (*chinensis*); KUNTH, Enum. Pl. III. (1841), p. 157 (*chinensis*); F. P. SMITH, Mater. Med. et Nat. Hist. China (1871), p. 189; BRETSCHN. Early Europ. Res. Fl. China (1880), p. 50 (*chinensis*).

*Sagittaria sagittifolia forma sinensis* MAKINO in Bot. Mag., Tokyo, XV. (1901), p. 105, excl. syn., et in INUMA, Somoku-Dzusetsu, ed. 3, IV. 20 (1912), p. 28, tab. 27 (*var.*); MATSUM. Ind. Pl. Jap. II. 1 (1905), p. 31.

*Sagittaria sagittifolia a. edulis* SIEB. Synops. Pl. Ceconom. Jap. in Verh. Batav. Gen. XII. (1827), p. 17; MIQ. Profl. Fl. Jap. in Ann. Mus. Bot. Lugd.-Batav. II. (1865–66), p. 138.

*Sagittaria edulis* SCHLECHT. in Linnaea, XVIII. (1844), p. 432.

*Sagittaria macrophylla* BUNGE, Enum. Pl. Chin. Bor. (1831), p. 63; MAXIM. Ind. Fl. Pek. in Prim. Fl. Amur. (1856), p. 477; BRETSCHN. Hist. Eur. Bot. Disc. China (1898), p. 341, non ZUCC.

*Sagittaria obtusa* THUNB. Fl. Jap. (1784), p. 242, excl. nom. *Sagittaria obtusifolia* LINN.

**forma a. albida** MAKINO, nov.

Tuber large, oval, ellipsoid or ovoid, often subcompressed; skin white or nearly so.

Nom. Jap. *Haku-kuwai* (nov. nom.), *Shina-kuwai* (nov. nom.).

Nom. Chin. 慈姑

Hab. JAPAN, cultivated, rare. (*Distrib.*) CHINA, cultivated.

**forma b. caerulea** MAKINO, nov.

Tuber large, globose or depressed-globose; skin caeruleous.

Nom. Jap. *Kuwai* (nowadays), *Shiro-kuwai* (old name).

Hab. JAPAN, widely and commonly cultivated for the sake of its edible tuber.

**var.  $\gamma$ . alismaefolia** MAKINO, nov. comb.

*Sagittaria sagittifolia var. alismaefolia* MAKINO in Bot. Mag., Tokyo, XXIII. (1909), p. 23.

Nom. Jap. *Hitotsuba-omodaka*, *Satsuma-omodaka*.

Hab. Prov. SATSUMA, rare.

(To be continued.)